Diabetic Foot Study Group

of the EASD

13th Scientific Meeting

9 - 11 September 2016
Stuttgart, Germany

Programme and Abstracts

Index

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Welcome

Dear participant
It is a great pleasure to welcome you to the 13th meeting of the Diabetic Foot Study Group of the EASD in Stuttgart.

The DFSG is very happy to welcome you all and we are very proud to call the DFSG a true interdisciplinary collaboration between diabetologists, podiatrists, specialist nurses, orthopaedic and vascular surgeons, as well as all other specialists with an interest in diabetic patients with foot problems.

The theme of the meeting is:

Advancement of knowledge on all aspects of diabetic foot care

The three meeting days will offer you a unique opportunity to meet with leading Diabetic foot experts and to be updated on the diabetic foot research happening across Europe.

We look forward to updates on main subjects like Epidemiology, Basic and clinical science, Diagnostics, Classification, Foot clinics, Biomechanics, Osteoarthropathy, Orthopaedic surgery, Infection, Revascularisation, Uraemia and Wound healing/ outcome.

For the first time the DFSG is joined by the Association of Diabetic Foot Surgeons (A-DFS), who has their 2nd symposium on the 8 and 9 September, focusing on various aspects of diabetic foot surgery.

A warm welcome to Stuttgart. Enjoy the conference!
On behalf of the DFSG executive committee

Prof. Dr. Ralf Lobmann

Chairman

Message of greeting of the Minister of Social Affairs and Integration

Ladies and gentlemen,

The high number of diabetes diseases presents great challenges not only to our health system, but also to the entire national economy.

Therefore we consider health promotion and prevention as a central task of health policy so that the occurrence of diabetes diseases is avoided as far as possible or at least recognized at an early stage.

In Baden-Württemberg we set the focus on eight health objectives, the first one being to "reduce the risk of Diabetes mellitus type 2 and its sequels". In order to support the implementation of this objective, the consulting committee "Diabetes Baden-Württemberg" which was founded in 2014 prepared a measure catalogue describing the present challenges and targets and the related recommendations for actions to be taken.

One of its priorities is to strengthen the support structures focusing on the prevention and improvement of the treatment of the diabetic foot syndrome.

I am delighted to welcome you in Stuttgart to the 13th meeting of the Diabetic Foot Study Group (DFSG) of the European Association for the Study of Diabetes (EASD) with leading experts in the field of the diabetic foot.

I wish you all interesting presentations, stimulating discussions and a lot of new findings.

With kind regards,

Manne Lucha

Minister for Social Affairs and Integration
Baden-Württemberg

Diabetic Foot Study Group of the EASD

Executive Committee 2016

Chairman
Ralf Lobmann
Germany

Vice Chairman
Klaus Kirketerp-Møller
Denmark

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Nikolaos Papanas
Greece

Anne Rasmussen
Denmark

Maximilian Spraul
Germany

Maureen Bates
United Kingdom

José Luis Lázaro
Martínez
Spain

Overview programme

Friday 9 September 2016

11:30 - 12:00	DFSG Press Conference
12:00 onwards	Registration desk open
14:00 - 14:15	Welcome
14.15 - 15.30	Combined session of A-DFS and DFSG
15.45 - 16.30	Oral Presentations: Charcot foot and surgery
16.30 - 17.00	Coffee / Tea Break
17.00 - 17.30	Industry symposium: Podartis
17.30 - 18.30	Oral Presentations: Infection
18:30 - 19:30	Welcome reception in the exhibition areas (included in the registration fee)

Saturday 10 September 2016

07:00	Podartis Diabetes Run / walk
09:00 – 10:30	Oral Presentations: Outcome and footwear
10.30 - 11.15	Coffee / Tea Break
11.15 - 12.15	Industry symposium: Medac
12.20 - 12.40	Paul Brand Award presentation
12.40 - 13.35	Lunch
13.35 - 14.30	Poster discussion I: 4 parallel sessions on Top 10 poster abstracts, Infection, Charcot & Biomechanic, Epidemiology & Care
14.30 - 15.30	Industry Symposium: Woundcare circle
15.00 - 15.30	Coffee / Tea Break
15:30 – 16:15	Invited talk: Train the Foot Trainer Project of IWGDF- the BLED- European edition of 2015
16:15 - 17:00	Presentation of 3 Top Orals to be judged for prize giving
17:15 - 18:45	Business Meeting and Assembly
19:30 - 23.00	Conference dinner (included in the registration fee) in Alte Reithalle, Maritim Hotel

Sunday 11 September 2016

09:00 - 10:30	Oral Presentations: Health care structures and Classification
10:30 - 11:00	Coffee / Tea Break
11:00 - 12.00	Industry symposium: URGO
12.05 - 12:50	Oral Presentations Varia
12:50 - 13.45	Lunch
13.45 - 14.45	Oral Presentations: Ischemia
14.50 - 15.50	Poster discussion II: 4 parallel sessions on Surgery - Vascular, Neuropathy, Research, and Outcome & Varia
16.00	Closing words and Farewell in the lobby of Maritim Hotel: Wine, soft drinks and snacks

Friday 9 September 2016

Time	Abs.	Title	Speaker	Area
09:00 - 11:00		DFSG Executive Committee Meeting		Salon Ulm
11:30 - 12:00		DFSG Press Conference		Salon Ulm
12:00 -		**Registration desk opens**		
14:00 - 14:15		**Welcome** By DFSG Chairman Ralf Lobmann		Schiller Saal
14.15 - 15.30		**Combined session of A-DFS and DFSG** **Chairs: Ralf Lobmann, Armin Koller**		Schiller Saal
		How to set up an interdisciplinary foot clinic	Kristien van Acker, Belgium	
		The surgeon - At the top of the foot chain or a constant companion?	David Armstrong, United States	
		Foot salvage and foot function - A potential contradiction?	Sicco Bus, Netherlands	
		Discussion		
15.45 - 16.30		**Oral Presentations: Charcot foot and surgery** **Chairs: Nina Petrova, Klaus Kirketerp-Møller**		Schiller Saal
	001	Rate of change in serum bone turnover markers in patients with Charcot osteoarthropathy treated with recombinant human parathyroid hormone – data from a double blind randomised placebo controlled clinical trial	Wegin Tang, United Kingdom	
	002	Treatment of the acute Charcot arthropathy in non-selected outpatient cohort: results of 8-year experience	Vadim Bregovskiy, Russian Federation	
	003	How to Improve the Outcome of Charcot Foot? – Results of 5 Years Follow up – Prospective Study	Mohamed Motawea, Egypt	
16.30-17.00		**Coffee / Tea Break**		Exhibition areas
17.00-17.30		**Podartis Symposium:** **PHYSICAL ACTIVITY? YES, IF PROTECTED** **The role of physical activity for diabetic subjects** **Chair: Ralf Lobmann**	PODartis Clinically Tested Footwear	Schiller Saal
			Sicco Bus, Netherlands	
			Carlo Caravaggi, Italy	
			Roberto da Ros, Italy	

Time	Abs.	Title	Speaker	Area
17.30-18.30		**Oral Presentations: Infection** **Chairs: José Luis Lázaro Martinez, Alberto Piaggesi**		Schiller Saal
	004	Value of SPECT/CT in the diagnosis of diabetic foot osteomyelitis by 99mTc-HMPAO-labeled leucocyte scan	Stamata Georga, Greece	
	005	The concordance of empirical antibiotic therapies in Primary Care versus antibiotic treatment guided by bone culture in patients with clinically suspected diabetic foot osteomyelitis	Aroa Tardáguila García, Spain	
	006	Admission time deep swab specimens compared to bone sampling to guide targeted antibiotic therapy in hospitalised patients with acute severe diabetic foot and osteomyelitis	Ana Manas, United Kingdom	
	007	Prospective assessment of white blood cell SPECT/CT in monitoring antibiotic treatment in patients with diabetic foot osteomyelitis	Julien Vouillarmet, France	
18:30-19:30		**Welcome reception in the exhibition** (Included in registration fee. Please note that the event is not a dinner)		Exhibition areas

Saturday 10 September 2016

Time	Abs.	Title	Speaker	Area
07.00		**Podartis Diabetes Run/Walk, 5 km, open to all participants**	PODartis Clinically Tested Footwear	Maritim Hotel Lobby
09:00 - 10:30		**Oral Presentations: Outcome and footwear Chairs: Michael Edmonds, Anna Trocha**		Schiller Saal
	O08	Assessment and cost analysis of the hyper acute diabetic foot service to manage the severe foot attack	Raju Ahluwalia, United Kingdom	
	O09	Decrease in (Major) Amputations in German Diabetics - A secondary data analysis by AOK Rheinland/Hamburg	Anna Trocha, Germany	
	O10	Increasing age and underlying renal problems are the main factors for increased mortality in DFU	Gavin Connolly, United Kingdom	
	O11	Clinical and microbiological outcomes after sequential low-frequency ultrasound wound debridement of neuroischemic diabetic foot ulcers	José Luis Lázaro, Spain	
	O12	Cost-effectiveness analysis of custom-made footwear on foot ulcer recurrence in patients with diabetes in the DIAFOS trial.	Nora Mejaiti, Netherlands	
	O13	Patients' adherence to customized diabetic insoles as objectively assessed by a temperature sensor	Dominic Ehrmann, Germany	
10.30 - 11.15		**Coffee / Tea Break**		Exhibition areas
11.15 - 12.15		**Medac Symposium: Diabetic foot patients with CLI: Managing no-option patients beyond evidence based treatment – Experience from European hospitals Chairs: Ralf Lobmann, Alberto Piaggesi**	medac	Schiller Saal
		Noninvasive management of the diabetic foot with critical limb ischemia: current options and future perspectives	Matthias Weck, Germany	
		Managing no-option patients with diabetic foot and CLI	Edward Jude, United Kingdom	
		Surgical options after failed revascularization in diabetics	Arjan Hoksbergen, The Netherlands	
		No option for revascularization: a limb- and life-threatening condition for the diabetic foot patient	Alberto Piaggesi, Italy	
12.20 - 12.40		**Paul Brand Award presentation Chairs: Maximillian Spraul, Jan Apelqvist**		Schiller Saal
	O14	Percutaneous Needle Flexor Tenotomy of Hammer, Mallet and Claw Toes in the Diabetic Patient	Jonas Hedegaard Andersen, Denmark	
12.40 - 13.35		**Lunch**		Exhibition areas
13.35 - 14.30		**Poster discussion I**		Poster area
		Parallel session A: Top 10 poster abstracts Chair: Nicholas Tentolouris		
	P01	The investigation of the antimicrobial activity of the Eastern European and New Zealand honey to multidrug-resistant strains	Vladislav Privolnev, Russian Federation	
	P02	The Charcot Foot: An Emerging Public Health Problem for African Diabetes Population	Zulfiqarali G. Abbas, Tanzania	
	P03	Analysis of 5-year Prognosis and Risk Factors in Chinese Patients with their first Diabetic Foot Ulcers	Chuan Yang, China	
	P04	Surgical Management of Charcot Deformity - Internal or External Fixation?	Kiriakos Daniilidis, Germany	
	P05	Plasmatic scalpel in the surgical treatment of diabetic foot osteomyelitis	Anton Rodin, Russian Federation	
	P06	Establishing normative thermal pattern data for the hands and feet: a first step in developing a diabetes thermography protocol	Alfred Gatt, Malta	
	P07	Autologous Mesenchymal Stem Cells In Treatment of Recalcitrant Neuropathic Diabetic Foot Ulcer: Randomized Controlled Trial	Ahmed Albehairy, Egypt	
	P08	Underuse of orthopedic shoes in Charcot patients: analyze of the routine clinical practice	Anastasia Demina, Russian Federation	
	P09	Factors associated with positive bone cultures in patients with diabetic foot ulcers	Veronika Woskova, Czech Republic	
	P10	Patients on haemodialysis have a higher number of risk factors for diabetic foot ulceration	Leticia Heys, United Kingdom	
		Parallel session B: Infection Chair: Oleg Udovichenko		
	P11	Common pathogens isolated in diabetic foot infections and respective risk factors for Gram-negative organisms	Aggelos Pappas, Greece	
	P12	Evaluation of the effective and safety using Daptomycin to chronic lower limbs ulcers with MRSA infections	Yuta Terabe, Japan	
	P13	The use of home parenteral antimicrobial therapy for diabetic foot infections and its associated cost savings and reduction in inpatient stay over a 1 year period	Shailesh Gohil, United Kingdom	
	P14	Infection and gut colonization by KPC-producing Klebsiella pneumoniae as risk factors for mortality in patients with diabetic foot infections: a multicentre case-control study	Elisabetta Iacopi, Italy	
	P15	High prevalence of quinolone-resistant microorganisms in Infected Diabetic Foot	Cesare Miranda, Italy	
	P16	Medical Imaging and Laboratory Analysis of Diagnostic Accuracy in 107 Consecutive Hospitalized Patients with Diabetic Foot Osteomyelitis and Partial Foot Amputations	Crystal Ramanujam, United States	
	P17	Diabetic Foot Infection as a cause for Fall in EGFR even in those with no CKD	Senthil Govindan, India	
		Parallel session C: Charcot - Biomechanic Chair: Sicco Bus		

Saturday 10 September 2016

Time	Abs.	Title	Speaker	Area
	P19	Charcot foot attacks in a non-transplanted Diabetes Mellitus population: the importance of corticosteroids as a causative factor	Jennifer Hautekeur, Belgium	
	P20	The role of the ct guided bone biopsy in patients with diabetic foot syndrome to differentiate osteomyelitis from Charcot-Neuroosteoarthropathy	Steffen Schöntag, Germany	
	P21	What MRI-intervals for monitoring the resolution of active diabetic Charcot foot ? A retrospective clinical study	Ernst Chantelau, Germany	
	P22	Biomechanics of the contralateral foot in diabetic patients with unilateral minor amputations	Tatiana Tcvetkova, Russian Federation	
	P23	Evaluation of D-Foot, a tool to identify the risk factor footdeformity in diabetes	Boel Dittmer, Sweden	
	P24	Deformation at first presentation is associated with ulceration in active Charcot foot: a prospective follow-up study of 62 patients of the IQED-Foot study	Jens Vermeersch, Belgium	
	P25	Diabetes, ankle plantar flexion and foot ulcers	Piergiorgio Francia, Italy	
	P26	Role of calcaneal quantitative ultrasonometry for diagnosis of Charcot foot in patients after pancreas transplantation	Robert Bem, Czech Republic	
	P27	Structural changes and biomechanical disorders in patients with Diabetes mellitus and high-risk foot	Raúl Molines Barroso, Spain	
	P28	Diagnosis of Charcot foot - a marker of overall decline in health and well-being: the patient's perspective	Jody Lucas, United Kingdom	
		Parallel session D: Epidemiology and Care **Chair: Maureen Bates**		
	P29	Do diabetes multidisciplinary foot clinics have an impact in reducing major amputation rates-The County Durham and Darlington experience?	Giridhar Tarigopula, United Kingdom	
	P30	Peripheral arterial disease and amputations in diabetic patients with Charcot foot:: Italian data 2003-2013	Roberto Anichini, Italy	
	P31	Total contact casting is effective treatment modality in foot ulcers in non-plantar areas	Maureen Bates, United Kingdom	
	P32	Multidisciplinary treatment of diabetic foot ulcers; a prospective study	Jan-Hein Prinsen, Netherlands	
	P33	A dedicated pain clinic based in the foot unit helps in the reduction of morbidity associated with diabetic painful peripheral neuropathy	Prash Vas, United Kingdom	
	P34	The Simple Staging System identifies patients at risk of adverse clinical outcome: results from a one year cohort study	Timothy Jemmott, United Kingdom	
	P35	Methodology of a structured diabetic foot education program (DFEP): A Pan India Initiative	Ashok Das, India	
	P36	The need for more open access to specialist diabetes foot care services: supported by high appointment complexity score for new self-referred patients	Daina Walton, United Kingdom	
14.30-15.30		**Woundcare Circle Symposium:** **Off-loading: Evidence, Practice and Strategies** **Chair: Maximillian Spraul**	WOUNDCARE CIRCLE	Schiller Saal
		The Evidence behind offloading	Alberto Piaggesi, Italy	
		Off-loading in primary and Secondary prevention	Jose Luis Lazaro, Spain	
		An algorithm for the modern Off-loading and for the Diabetic foot in Remission	David Armstrong, USA	
		Discussion		
15.00-15.30		**Coffee / Tea Break**		Exhibition areas
15:30 – 16:15		**Invited talk: Train the Foot Trainer Project of IWGDF- the BLED- European edition of 2015**		Schiller Saal
		Introduction and global outcome	Kristien Van Acker, Belgium	
		Outcome from Ukraine	Maksym Gorobeiko, Ukraine	
		Outcome from Turkey	Bengusu Mirasogl, Turkey	
		Outcome from Croatia	Anica Badanjak, Croatia	
16:15-17:00		**Presentation of 3 Top Orals** **to be judged for prize giving** **Chairs: Maximillian Spraul, Vilma Urbančič**		Schiller Saal
	PO1	Treatment with recombinant human parathyroid hormone does not enhance clinical resolution and fracture healing of Charcot osteoarthropathy - double blind randomised placebo controlled clinical trial	Michael Edmonds, United Kingdom	
	PO2	Initial results of the national diabetes footcare audit of England and Wales	William Jeffcoate, United Kingdom	
	PO3	Evaluation of the effectiveness and cost-effectiveness of lightweight fibreglass heel casts in the management of ulcers the heel in diabetes: a randomised controlled trial	Fran Game, United Kingdom	
17:15-18:45		**Business Meeting and Assembly** **New DFSG executive members to be elected**		Schiller Saal
18:45-19:00		DFSG Executive Committee Meeting		Salon Ulm
19:30-23.00		**Conference dinner.** Open to all participants.		Alte Reithalle, Maritim Hotel

Sunday 11 September 2016

Time	Abs.	Title	Speaker	Area
09:00 - 10:30		**Oral Presentations: Health care structures and Classification** **Chairs: William Jeffcoate, Kristien van Acker**		Schiller Saal
	O15	A Review of the Impact of a New Footcare Intervention Programme Carried out in Two Haemodialysis Units in Nottingham, UK	Lisa Metcalf, United Kingdom	
	O16	Characteristics of new-patient referrals to specialist diabetes foot care services across Europe	Claas Lüdemann, Germany	
	O17	Effectiveness of treatment in networks practicing shared care for people with DFS	Dirk Hochlenert, Germany	
	O18	Prediction Model for Plantar Foot Ulcer Recurrence in High-Risk Diabetes Patients	Wouter aan de Stegge, Netherlands	
	O19	Is transcutaneous oxygen pressure a suitable measurement method for assessment of the effect of cell therapy on critical limb ischemia in diabetic patients?	Michal Dubsky, Czech Republic	
	O20	Severity of foot pathology (IWGDF categories 2 and 3) shows the strongest association with mortality in diabetes	Dragan Tesic, Serbia	
10:30 - 11:00		**Coffee / Tea Break**		Exhibition areas
11:00 - 12.00		**URGO Symposium:** **The big enemy: Late referral** **From good local woundcare to timely and integrated interdisciplinary care** **Chair: Kristien van Acker**	URGO MEDICAL HEALING PEOPLE®	Schiller Saal
		Introduction to Local woundcare: what's new? Elevated level of MMPs in DFU and impact on wound healing.	Jose Luis Lazaro, Spain	
		Presentation of a survey of Four Nations Practice of Diabetic Foot Care	Chris Manu, United Kingdom	
		The Diabetic Foot attack :concept and possible tools	Michael Edmonds, United Kingdom	
		How to involve Acute medicine in Emergency Diabetic Foot Ulcer management?	Marcus Simmgen, United Kingdom	
12.05 - 12:50		**Oral Presentations Varia** **Chairs: Ralf Lobmann, Fran Game**		Schiller Saal
	O21	Painful neuropathy is common but largely undiagnosed in subjects with and without diabetes participating in a nationwide educational initiative (PROTECT Study)	Doerr Stefan, Germany	
	O22	MicroRNA 210 role for wound healing in diabetes	Sergiu Bogdan Catrina, Sweden	
	O23	Screening of Obstructive sleep apnea syndrome with respect to the incidence of macrovascular complications and impairment of microcirculation in patients with the diabetic foot	Vladimira Fejfarova, Czech Republic	
12:50 - 13.45		**Lunch**		Exhibition areas
13.45 - 14.45		**Oral Presentations: Ischemia** **Chairs: Nikolaos Papanas, Edward Jude**		Schiller Saal
	O24	MR spectroscopy in the assessment of effect of revascularization in diabetic patients with critical limb ischemia	Andrea Nemcova, Czech Republic	
	O26	Impact of heart failure and dialysis in the prognosis of diabetic patients with critical limb ischemia and foot ulcer	Marco Meloni, Italy	
	O27	Is WIfI scoring system enough for identifying factors related to healing diabetic foot ulcers in patients with critical limb ischemia?	María Pilar Vela Orús, Spain	
14.50-15.50		**Poster discussion II**		Poster area
		Parallel session E: Surgery - Vascular **Chair: Zulfiqarali G. Abbas**		
	P37	Plantar surgical approach and mid foot stabilization by external fixation in treatment of mediotarsal osteomyelitis in ulcerated mid foot charcot neuroarthropaty	Carlo Caravaggi, Italy	
	P38	Conservative approach is a good option in diabetic foot surgical treatment?	Roberto da Ros, Italy	
	P39	Indocyanine green fluorescence angiography in diabetic patients with peripheral arterial disease	Zera Abdulvapova, Russian Federation	
	P40	Squared fasciocutaneous random plantar flaps in the treatement of noninfected diabetic plantar ulcers	Carlo Caravaggi, Italy	
	P41	Medium-term follow up in patients who were performed curative surgery in neuropathic forefoot ulcers in patients with Diabetes mellitus	Esther Garcia Morales, Spain	
	P42	Diabetic foot surgery performed by diabetologists in a third level centre: results of 15 years of activity	Chiara Goretti, Italy	
	P43	Estimation of wound healing possibility (based on the number of amputations and mortality of patients) in dependence of perfusion in cases of syndrome of diabetic foot	Maksym Gorobeiko, Ukraine	
	P44	Is the peripheral vascular disease of patients Type 2 diabetes different from that of patients with Type 1 diabetes?	Chris Manu, United Kingdom	
	P45	Interobserver reliability of the ankle-brachial index (ABI), toe-brachial index (TBI) and distal pulses palpation in patients with diabetes	Francisco Javier Alvaro Afonso, Spain	
	P46	Surgical outcomes in patients with osteomyelitis located on the sesamoids treated by conservative surgery. A technical propose	Victoria Candelario Poteleschenko, Spain	
		Parallel session F: Neuropathy **Chair: Nikolaos Papanas**		
	P47	Evaluation of the usage special customised protective footwear in preventing ulcerations and amputations of the lower extremities in patients with neuropathy	Addo Tesfaye, Greece	
	P48	Relationship of Plantar Pressure and glycemic control in Type 2 Diabetic patients with and without neuropathy	Rana El-Hilaly, Egypt	

Sunday 11 September 2016

Time	Abs.	Title	Speaker	Area
	P49	Which is the most frequently abnormal neuropathy test in patients with type 2 diabetes and neuropathic foot ulcer?	Nikolaos Papanas, Greece	
	P50	Neuropathy is more common than peripheral vascular disease or deformity as a risk factor for Diabetic Foot in urban Indian population	Satyan Rajbhandari, United Kingdom	
	P51	Corneal Confocal Microscopy And Cardiovascular Autonomic function Tests For Detecting Diabetic Neuropathy In Children	Ekaterina Artemova, Russian Federation	
	P52	Effect of orthopedic footwear concepts on plantar pressure relief and patient satisfaction in patients with diabetes mellitus	Jennefer Zwaferink, Netherlands	
	P53	Utility of Sudomotor function test as a clinical tool in risk stratification system of diabetic patient	Irene Sanz, Spain	
	P54	Change in fat pad composition in the neuropathic diabetic foot and it's association with dynamic plantar foot pressure	Sicco Bus, Netherlands	
		Parallel session G: Research **Chair: Nicolaas C. Schaper**		
	P55	Complete wound healing in a month and persisting for 2 years with the use of autologus adipocyte tissue derived - Mesenchymal stem cells in a non-healing diabetic ulcer. A case presentation	Triantafillos Didangelos, Greece	
	P56	New possibility to evaluate bone quality in female with DM2	Tatiana Gracheva, Russian Federation	
	P57	Relationship between inflammatory markers with clinical and histological presentation of diabetic foot osteomyelitis	Rebeca Alvarez-Madroñal, Spain	
	P58	Albuminuria as predictive risk factor for foot ulceration in patients with diabetes mellitus	Johana Venerova, Czech Republic	
	P59	Use of a new antibiotic bone substitute to induce healing of osteomyelitis in the diabetic foot	Christine Whisstock, Italy	
	P60	Plasma levels of Asymmetric Di Methyl Arginine and endothelial dysfunction in diabetic subjects with neuropathic foot ulcer	Fady Kyrillos, Egypt	
	P61	Expression of Different collagen types in diabetic foot ulcers and chronic wounds of various etiology	Elena Komelyagina, Russian Federation	
	P62	Assessment of Microcirculation in the Foot of People with Diabetes with Laser Speckle Contrast Imaging	O. A. Mennes, Netherlands	
		Parallel session H: Outcome and Varia **Chair: Anne Rasmussen**		
	P63	Impact of a diabetic foot ulcer: the family's point of view	Ying Ying Kong, Belgium	
	P64	Impact of a diabetic foot ulcer: the patient's point of view	Evelien Coeckelbergh, Belgium	
	P65	Acellular Fish Skin Graft's Structure and Bioactivity is Better Preserved Compared to Mammalian Derived Scaffolds due to Less Harsh Processing	Maria Kristinsdottir, Iceland	
	P66	The effectiveness of VAC-therapy in patients with diabetic foot	Svyrydov Mykola, Ukraine	
	P67	Variables associated to the impact on the quality of life of relative carers of patients with Diabetic Foot Ulcer	Yolanda García Álvarez, Spain	
	P68	Long-term results of endovascular therapy in diabetic patients with critical limb ischemia	Anna Gorbacheva, Russian Federation	
	P69	Efficacy of diabetic foot team in early treatment of limb and life threatening diabetic foot infections	Paolo Galenda, Italy	
	P70	6-year results of a diabetic foot unit: a toe-flow model	Juan Pedro Sánchez Ríos, Spain	
16.00		**Closing words and farewell** **Coffee, tea, snacks and wine**		Maritim Hotel Lobby

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Diabetic Foot Study Group

of the EASD

Porto · Portugal
8 - 10 September 2017

Conference theme

Advancement of knowledge on all aspects of diabetic foot care

Main subjects during conference

- Epidemiology
- Basic and clinical science
- Diagnostics
- Classification
- Foot clinics
- Biomechanics, Osteoarthropathy
- Orthopaedic surgery
- Infection
- Revascularisation
- Uraemia
- Wound healing/outcome

- Be updated on diabetic foot research happening across Europe
- Understand risk factors for foot ulceration and Charcot foot
- How technology can help in preventing foot ulcers and facilitate wound healing
- Practice and innovation of Diabetic Foot Wound Treatment

Prize Orals

[PO1] TREATMENT WITH RECOMBINANT HUMAN PARATHYROID HORMONE DOES NOT ENHANCE CLINICAL RESOLUTION AND FRACTURE HEALING OF CHARCOT OSTEOARTHROPATHY - DOUBLE BLIND RANDOMISED PLACEBO CONTROLLED CLINICAL TRIAL

Michael Edmonds[1], AN Donaldson[1], Wegin Tang[1], Maureen Bates[1], Timothy Jemmott[1], V Morris[1], David Elias[2], Nina Petrova[2]

[1] *Diabetic Foot Clinic, King's College Hospital NHS Foundation Trust, London, United Kingdom*
[2]*King's College Hospital, London, United Kingdom*

Aim: The main objective of this study was to investigate whether recombinant human parathyroid hormone (rh PTH 1-84) can enhance fracture healing and arrest bone and joint destruction in the acute diabetic Charcot foot.

Method: We carried out a double blind randomised placebo controlled trial in 48 patients with acute Charcot osteoarthropathy. We treated patients with daily subcutaneous injections of recombinant human parathyroid hormone (rh PTH 1-84) or placebo until clinical resolution of the osteoarthropathy or up to a period of 12 months. All patients received casting therapy and Calcium and Vitamin D3 supplementation. Time to clinical resolution was recorded in months. Semiquantitative bone marrow oedema (BMO) scores and fracture scores were calculated on non-contrast magnetic resonance imaging scans and the rate of change of these scores at presentation and on follow up (at clinical resolution or at 12 months) was compared between the groups.

Results/Discussion: Logistic regression analysis indicated that there was no statistical difference between the active and placebo in the percentage of patients with clinical resolution at 6 months (Odds ratio=0.94; 95% CI 0.30 to 3; P=0.92) and at 12 months (Odds ratio=2.3; 95% CI 0.68 to 7.7; P=0.18). There was no statistically significant difference between the survival (non-resolution) patterns between the active and placebo groups. The log-rank (Mantel-Cox) statistic was 0.11 yielding a p-value of 0.74 and the estimated hazard (for resolution) ratio was 1.1 (95% CI 0.57 to 2.1; P=0.78).

The total BMO score significantly decreased between presentation and follow up (p<0.001). However, the rate of change in the total BMO score was not significantly different between the active and placebo groups (p=0.95). Similarly, the total fracture score significantly decreased between presentation and follow up (p=0.001). However, the rate of change in the total fracture score was not significantly different between the active and placebo groups (p=0.55).

Conclusion: This study has shown that treatment with rh PTH does not enhance time to resolution and fracture healing of the acute Charcot foot. Casting therapy remains the mainstay of Charcot foot management.

[PO2] INITIAL RESULTS OF THE NATIONAL DIABETES FOOTCARE AUDIT OF ENGLAND AND WALES

William Jeffcoate[1], Tom Latham[2], Arthur Yelland[2], Robert J. Young[3]

[1]*Nottingham City Hospital, Foot Ulcer Trials Unit, Diabetes and Endocrinology, Nottingham, United Kingdom*
[2]*Health and Social Care Information Centre, Leeds, United Kingdom*
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Aim: There is evidence of considerable variation in the outcome of disease of the foot – both within and between countries. Systematic audit is required to document the extent of variation and can therefore be a key tool in improving overall quality of care. This report presents details of experience gained in the first 12 months of the National Diabetes Footcare Audit (NDFA) of England and Wales.

Method: The NDFA was launched in July 2014 with the aim that all specialist services might eventually participate. Each is asked to recruit as many as possible of all newly presenting episodes of foot ulceration and to enter key information on-line. Core demographic information on their diabetes history is obtained centrally by database linkage and does not need to be specifically gathered; the only data submitted are (a) the time elapsed between first presentation to a health care professional and first assessment by an expert, (b) the type and severity of the index foot ulcer using the SINBAD system and (c) a single measure of clinical outcome – being alive and ulcer-free at 12 weeks and at 24 weeks. Further outcome data (including hospital admission, incidence of amputation and later mortality) are obtained by electronic linkage to national databases of hospital activity and population statistics.

Results/Discussion: 5215 ulcer episodes (in 5015 people) were registered by 129 specialist clinical services in the first nine months. When the foot ulcer population was compared with the core national diabetes population, there were more males (70% vs 56%), mean age was higher (67 vs 64 years) and there were fewer people of Asian extraction (3% of T2DM vs 10%). 2804 index ulcers (53.8%) were graded less severe (SINBAD score <3) while 2411 (46.2%) were graded more severe (≥3). Statistically significant relationships were observed between the time to first assessment and ulcer severity, between the time to first assessment and ulcer-free survival at 12 weeks and between ulcer severity and ulcer-free survival at 12 weeks. The outcome was significantly worse when the delay to first expert assessment was 14 days or longer.

Conclusion: These initial results confirm the feasibility of undertaking nationwide online audit of foot ulcers and the early results provide strong support for the current recommendation that all newly occurring ulcers should receive early referral for expert assessment. When numbers are greater and outstanding outcome data are available, it will be possible to make case-mix adjusted comparisons of outcomes between different health economies and geographical areas as well as between individual specialist services.

[PO3] EVALUATION OF THE EFFECTIVENESS AND COST-EFFECTIVENESS OF LIGHT-WEIGHT FIBREGLASS HEEL CASTS IN THE MANAGEMENT OF ULCERS THE HEEL IN DIABETES: A RANDOMISED CONTROLLED TRIAL

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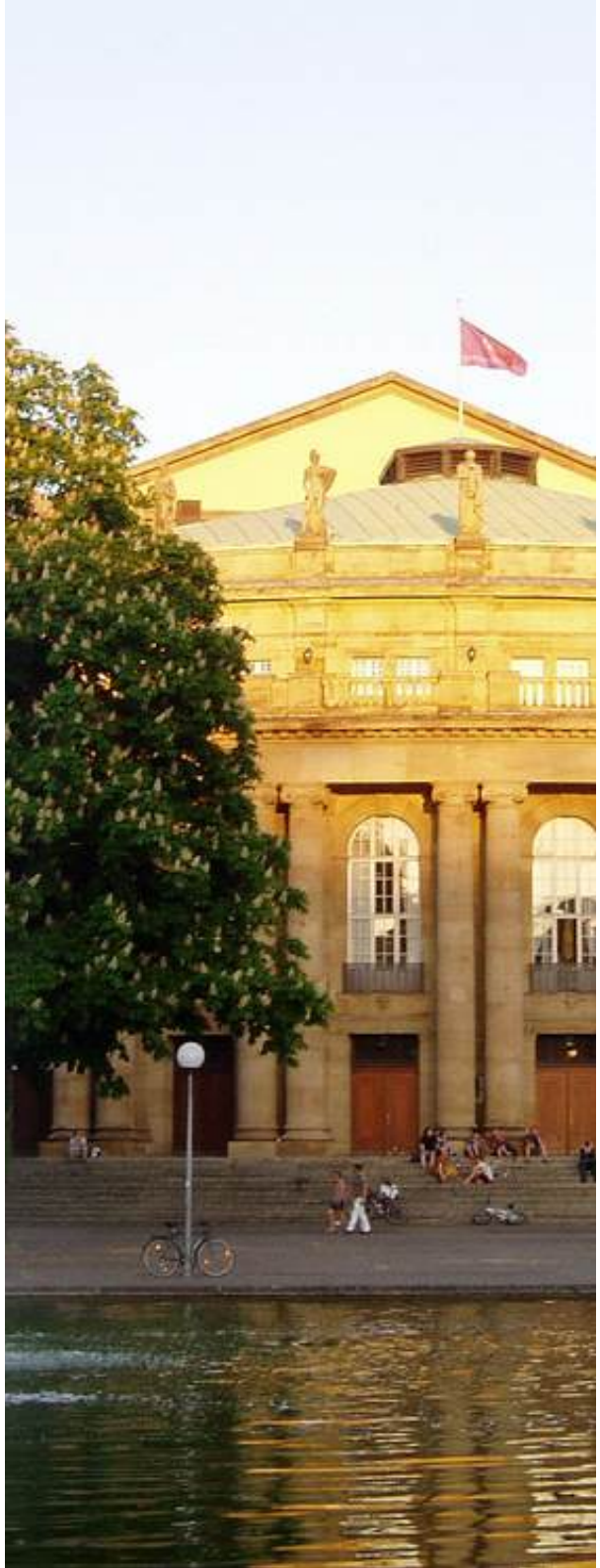
Aim: Management of heel ulcers in diabetes is difficult: there is no specific treatment and the median time to healing exceeds 200 days. An uncontrolled pilot study presented to the DFSG in 2009 suggested that use of lightweight fibreglass heel casts might result acceleration of healing. The aim of this study was to undertake a formal evaluation by comparing outcome following the use of such heel casts in addition to usual standard care with standard care alone. The study was funded by the UK NIHR Health Technology Assessment programme.

Method: This was a randomised observer blind trial with patients randomised 1:1 to intervention or usual care, stratified by ulcer depth and cross-sectional area. The study was powered to detect a difference in healing of 15 percentage points (55% versus 40%). Participants were identified from 35 specialist diabetic foot services in UK. Soft tissue infection was not an exclusion criterion nor were peripheral artery disease of any severity or impaired renal function. Those in the intervention arm received usual care supplemented by the use of a lightweight fibreglass cast moulded from the participant's heel, applied over the primary dressing and held in place with tape/bandage. Participants were reviewed each two weeks when the ulcer was debrided (if necessary), cleaned and re-dressed. Dressing changes between clinic visits were undertaken by their usual clinical carer. The primary outcome was healing at or before 24 weeks. Secondary outcomes included time to healing, secondary infection, new ulceration, pain, incidence of minor and major amputation and health status. Health economic analysis was undertaken to assess the incremental cost per Quality Adjusted Life Year.

Results/Discussion: 509 participants (68% male; mean age 67.5±12.4 years) were recruited. Median ulcer area was 275 (25^{th}-75^{th} centile: 104-683) mm^2 and ulcer duration at baseline was at least 2 weeks. 256 and 253 participants were randomised to the intervention and control groups, respectively, and primary outcome data were available in 212 and 213. When analysed by intention to treat, 94 (44%) of the intervention group healed with 24 weeks of follow-up, compared with 80 (37%) in the control group (OR 1.42 (0.95, 2.14), p=0.088). Median adherence to the use of the intervention was 100%; findings were unaffected by per protocol analysis. There was no difference between groups in any other outcome measure or in adverse events. The costs in the two groups were not statistically different.

Conclusion: The study was conducted to a high standard. It was not possible to demonstrate clear benefit from the intervention.



Oral Abstracts

[001] RATE OF CHANGE IN SERUM BONE TURNOVER MARKERS IN PATIENTS WITH CHARCOT OSTEOARTHROPATHY TREATED WITH RECOMBINANT HUMAN PARATHYROID HORMONE – DATA FROM A DOUBLE BLIND RANDOMISED PLACEBO CONTROLLED CLINICAL TRIAL

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Aim: There is a growing body of evidence to show that parathyroid hormone is an effective anabolic therapy for the enhancement of bone repair, following fracture. Furthermore, healing of fractures can be monitored with markers of bone turnover.

The main objective of this study was to measure prospectively bone markers and assess fracture healing in patients with acute Charcot osteoarthropathy treated with recombinant human parathyroid hormone (rh PTH 1-84) / placebo until clinical resolution or up to a period of 12 months.

Method: We carried out a double blind randomised placebo controlled clinical trial in 48 patients with acute Charcot osteoarthropathy. Serum concentration of the bone turnover markers amino-terminal propeptide of type I procollagen (P1NP) and carboxyterminal telopeptide of type 1 collagen (CTX) were measured at presentation and then at 3 monthly intervals until clinical resolution of the osteoarthropathy or up to a period of 12 months. The rate of change of the serum concentration of these bone turnover markers from baseline and to clinical resolution was compared between the active and placebo groups.

Results/Discussion: There was a significant reduction in the serum concentration of P1NP during the study period, (P=0.004). However, the rate of change in P1NP was not significantly different between the active and placebo groups (P=0.13).

The serum concentration of CTX remained unchanged from presentation to follow up (P=0.92). Moreover, there was no significant difference in the longitudinal change of this marker between the active and placebo groups. (P=0.25).

Conclusion: This study has shown that serial measurements of the serum concentration of the systemic bone turnover markers CTX and P1NP are not useful when monitoring treatment with rh PTH and do not differentiate between active and placebo treatment.

[002] TREATMENT OF THE ACUTE CHARCOT ARTHROPATHY IN NON-SELECTED OUTPATIENT COHORT: RESULTS OF 8-YEAR EXPERIENCE

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Aim: To analyze the results of the treatment in patients with the active Charcot arthropathy (ACA).
Method: 141 patients (males/females: 68/73; type 1/2: 78/63) with ACA (stage 0 – 29; stage 1 – 112) and without foot ulcer at the first presentation were followed until healing of destructions (non-active stage, NASA). Median duration of ACA before first visit – 2,25 months (0-18). Criteria of NACA were as follows: absence of edema, redness and the temperature difference between feet less than 2 degrees of Celsius accompanied with coalescence on X-ray and absence or slight bone marrow edema on MRI. 78 pts. were under the treatment (68 pts. were casted, 10 used walkers), 63 pts. refused of treatment but agreed to be under the follow-up.

Results/Discussion: Main causes of refuse were: distrust to doctor (39,13%), problems with employment (33%), home or family problems (17,4%), concomitant pathology (10,47%). Mean healing time in the treatment group and in "refusers", respectively: 11,4±6,8 months and 17,3±8,9 months (p<0,001). Healing time did not depend on the stage of ACA and was longer in pts. used walkers vs. contact casts: 13,8±7,3 vs. 11,2±6,5 months (p<0,02). The final foot deformities in pts. with stage 0 vs. stage 1: light (90% vs. 44,9%), moderate (10% vs. 22,4%) and severe (0% vs. 32,7%); p<0,01 for inter-group difference. Age, diabetes type, gender, clinical parameters of diabetes and its complications did not influence on the time of transition ACA to NACA. The higher the quantity of affected foot regions, bones and physical activity of pts, the more severe foot deformities were noticed at the end of treatment (p<0,02). The type of off-loading devise did not influenced on the course of CA. Complications were more frequent in "refusers" compared with treatment group (56,4% vs. 17,5%) and more severe (13,6% amputations vs. 0%). Complication rate in pts. treated with walkers was 3-fold higher compared with those pts. who used casts (p<0,05). Relapses were noticed in 13 pts: their healing time was 15,1±8,4 months. They differed from pts. without relapses only with more high level of physical activity.

Conclusion: 44,7% of patients refused of treatment. A large gap between the onset of CA and beginning of the treatment probably explains long treatment periods and absence of difference in healing times between stages 0 and 1. However treatment in stage 0 is more effective compared with stage 1 in severity of foot deformities. Foot morphology and patient-related factors influenced on the effect of treatment. The use of casts was more safe and effective compared with walkers.

[003] HOW TO IMPROVE THE OUTCOME OF CHARCOT FOOT? – RESULTS OF 5 YEARS FOLLOW UP – PROSPECTIVE STUDY

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Aim: Study the impact of nullification of the suggested risk factors responsible on better outcome of Charcot neuroosteoarthropathy (CN), and its contralateral foot (CF).

Method: Prospective analysis of the impact of compliance with the nullified suggested risk factors on both feet as 1. Compliance with the removable-cast-walker (RCW), 2. Compliance with the regular follow-up visits, 3. Nullified leg-length-discrepancy induced by the high rigid outsole of the RCW, and 4.slowing of the gait speed (24 steps ± 3/min). 43 Patients presented ≥5 years ago with unilateral CN and normal CF were included and subdivided into (Group A) compliant with all nullified risk factors and (Group B) non-compliant with ≥1 of the nullified risk factors, of matched age, sex and BMI, and with no statistically significant difference regarding HbA1c and diabetes duration in between. Both feet are then examined for any complications happened since January 2010 till February 2016.

Results/Discussion: ≥5 years ago, the CN foot showed no significant difference between both groups regarding the history of ulceration 28%(n=5) vs 44%(n=11), recurrent ulceration 11%(n=2) vs 12.5%(n=3), deformity 66.7%(n=12) vs 68%(n=17), ulcer/deformity relationship 80%(n=4) vs 44.4%(n=4) of the ulcers were related to the foot deformity, and minor amputation 16.7%(n=3) vs 16%(n=4), in group A vs group B respectively, p value in all was > 0.05, as shown in table 1. After ≥5 years, 5.6%(n=1) vs 20%(n=5) in CN foot, and 0% vs 20%(n=5) in the CF have new ulcers, 5.6%(n=1) vs 28%(n=7) in CN foot, and 11%(n=2) vs 4%(n=1) in the CF have new deformity, 0% vs 4%(n=1) in CN foot, and 5.6%(n=1) vs 4%(n=1) in the CF have minor amputation, and 16.7%(n=3) vs 24%(n=6) in the CF developed CN, in group A vs group B respectively, as shown in table 2. In summary, there is statistically significant difference regarding the complications happened in the CN foot, 11.1%(n=2) vs 44%(n=11) and in the CF, 16.7%(n=3) vs 48%(n=12) in group A vs group B respectively, (p<0.05 in both). Logistic regression analysis for prediction of occurrence of complications reveals that the adherence to nullification of these risk factors decreases the risk of occurrence of complications by >6 folds in the CN foot (odds ratio 6.3, p=0.03) and >4 folds in the CF (odds ratio 4.6, p=0.04).

Conclusion: Nullification of leg-length-discrepancy, slowing of the gait speed, compliance with the RCW and regular follow up visits greatly improved the outcome of patients with CN in Mansoura Foot clinic.

Table 1: Comparison between compliant and non-compliant groups 5 years ago (1st presentation)

	The Charcot foot				
	History of Ulceration	**Presence of deformity**	**Minor amputation**	**Recurrent ulceration**	**Ulcer/deformity relationship**
Group.A (n=18)	28%(n=5)	66.7%(n=12)	16.7%(n=3)	11%(n=2)	80%(n=4)
Group.B (n=25)	44%(n=11)	68%(n=17)	16%(n=4)	12.5%(n=3)	44.4%(n=4)
p-value	0.22	0.59	0.63	0.64	0.24

Table 2: Comparison between compliant and non-compliant groups after 5 years duration

	The Charcot foot			The Contralateral foot			
	New Ulcers	**New Deformity**	**New Minor amputation**	**Ulcers**	**Deformity**	**Minor amputation**	**Charcot**
Group.A (n=18)	5.6% (n=1)	5.6% (n=1)	0% (n=0)	0% (n=0)	11% (n=2)	5.6% (n=1)	16.7% (n=3)
Group.B (n=25)	20% (n=5)	28% (n=7)	4% (n=1)	20% (n=5)	4% (n=1)	4% (n=1)	24% (n=6)
p-value	0.02			0.034			

[004] VALUE OF SPECT/CT IN THE DIAGNOSIS OF DIABETIC FOOT OSTEOMYELITIS BY 99MTC-HMPAO-LABELED LEUCOCYTE SCAN

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Background and aim: Scintigraphy with in vitro labeled leucocytes is a well established method for diagnosing diabetic foot osteomyelitis (DFO). However, poor spatial resolution and lack of anatomic landmarks often limit the ability of labeled leucocyte scan to discriminate bone from soft tissue infection, especially in areas with small bone structures as in the foot. The aim of the study was to evaluate the contribution of SPECT/CT as an adjunct to planar images of ^{99m}Tc-HMPAO-labeled leucocyte scan (LS) for diagnosing and localizing infection in the diabetic foot.

Patients and methods: Fifty consecutive patients with clinical suspicion of DFO were included in the study. Totally 64 pedal sites suspected for DFO were investigated by ^{99m}Tc-HMPAO-labeled leucocyte scan. Planar images were acquired 1 and 4 hours post injection of in vitro labeled autologous leucocytes followed by a SPECT/CT scan at the end of the study. LS images were interpreted alone and in conjunction with SPECT/CT scans and were considered to be positive for DFO when focally increased leucocyte bone uptake was observed. Final diagnosis was based on clinical and radiological follow-up or bone biopsy.

Results: Among the 64 pedal sites investigated, 24 cases of DFO, 5 cases with acute Charcot arthropathy without osteomyelitis, 31 sites with simple soft tissue infection (STI) and 4 sites negative for active infection were finally diagnosed. LS planar images showed increased leucocyte accumulation compatible with active -bone and/or soft tissue- infection in 60 of 64 sites, and were negative for active infection in 4 of 64 sites. In patients with positive scans, the addition of SPECT/CT correctly localized infection to bone in 23 of 24 sites with DFO and to soft tissues in 30 of 31 sites with STI, changing the interpretation of planar images in 12 of 60 patients with positive scans and providing additional anatomical information and precise definition of the extend of infection in 33 more patients with positive scans. Conversely, the addition of SPECT/CT did not alter the evaluation of patients with negative LS planar scans. Sensitivity, specificity, accuracy, positive and negative predictive value of LS planar images for diagnosing DFO were 82.6%, 78 %, 79.7 %, 67.9% and 88.9% respectively. All values were improved with the addition of SPECT/CT to 100%, 95.1%, 96.9%, 92% and 100%, respectively.

Conclusion: SPECT/CT improves the diagnostic performance of ^{99m}Tc-HMPAO-labelled leucocyte scan for DFO. The additional performance of SPECT/CT increased the diagnostic accuracy of LS for DFO from 79.7% to 96.9% by enhancing both sensitivity and specificity of the study. The CT component of SPECT/CT provides accurate anatomical localization of increased leucocyte uptake, enabling discrimination of bone from soft tissue infection and better definition of the extent of infection.

[005] THE CONCORDANCE OF EMPIRICAL ANTIBIOTIC THERAPIES IN PRIMARY CARE VERSUS ANTIBIOTIC TREATMENT GUIDED BY BONE CULTURE IN PATIENTS WITH CLINICALLY SUSPECTED DIABETIC FOOT OSTEOMYELITIS

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Aim: To analyze if the empirical antibiotic prescribed at Primary Care by General practitioner (GP's) is correlated with the results of bone cultures in patients with diabetic foot osteomyelitis (DFO).

Method: An observational study was performed in 80 patients with clinical suspect of DFO, who are taking antibiotic prescribed by GP's for treating bone infections. Bone samples were taken in every patient for microbiological and histological analysis. Bone cultures' sensitivity was compered with previous antibiotic therapy. We analyzed antibiotic concordance and bacterial resistant. If the infection were polymicrobial the antibiotic selected in the antibiogram should be sensitive in all of the pathogen isolated.

Results/Discussion: Median time from ulcer was 13,5 weeks (Q1: 25-Q3: 30) and the patients were taking antibiotics for a median time of 5 weeks (Q1: 3-Q3: 10) so far. The previous antibiotic and the results of bone culture match only in 18.8% (n=15) of the patients. 81.3% (n=65) of the patients had bacteria's resistance to the antibiotic that they were taking. Most concordance antibiotics were 60% (n=9) beta-lactams and 26.7% (n=4) quinolones. Most sensitive antibiotic to bone cultures were cephalosporin 81.3% (n=65), quinolones 35% (n=28), beta-lactams 22.5% (n=18) and meropenem 17.5% (n=14). In most cases the selection of the empirical antibiotic therapy in Primary care didn't correspond with the result of the bone culture so the hierarchy of the administration of empiric antibiotic treatment should change it.

Conclusion: The International Guidelines are not well implement in Primary care. These Guidelines should be implemented in Primary Care properly in order to choose the best antibiotic therapy in this kind of infections. In most of the cases DFO are not well treating primarily by GPs that could produce complications as: ulcers worsening, infections spreading by bacteria's resistant and minor and major amputations.

[006] ADMISSION TIME DEEP SWAB SPECIMENS COMPARED TO BONE SAMPLING TO GUIDE TARGETED ANTIBIOTIC THERAPY IN HOSPITALISED PATIENTS WITH ACUTE SEVERE DIABETIC FOOT AND OSTEOMYELITIS

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Aim: A significant challenge in guiding antibiotic therapy among hospitalized individuals with severe diabetic foot infection is the lack of a gold standard culturing technique. Whist many studies have suggested that cultures from wound swabs are unreliable; their findings have been limited by poor swabbing technique, use of historical swab results and inclusion of non-selective outpatient and hospitalized patient cohorts with widely variant ulcer stages. Our study aimed to evaluate if deep swab cultures taken at time-point of a hospital admission with a severe diabetic foot infection could reliably identify pathogens compared to cultured bone specimens.

Method: Retrospective review of consecutive hospital admissions with a severely infected diabetic foot, Texas Grade 3 ulceration and clinico-radiological evidence of osteomyelitis over a 9 month period. A deep swab (DWS) through the actively infected discharging ulcer down to the bone, was taken at time of admission. Bone sampling was undertaken during surgery (SBS). The number of organisms isolated per individual per sampling technique was then determined and data is represented as such.

Results: A total of 59 subjects (average 63±9 years, 75% male, 85% Type 2 diabetes, HbA1C 8.9%) met the inclusion criteria. The number of organisms isolated by DWS was significantly lower than with SBS (0.9±0.7 vs1.5±1.0 individual, p=0.02). With the DWS technique, 42/59 (73%) of individuals had 1 or more positive growth, whilst with SBS the proportion was higher, 50/59 (85%). Importantly, all but one individual with no growth on DWS had a positive culture on SBS. Furthermore, there was poor concordance in growth between the techniques, with only 15 /59 (25%) growing identical organisms (κ=0.3). There was a trend for individuals with negative SBS 09/59 (15%) to wait longer to have their index infection clearance surgery (average 5.8 days vs 4.5 days amongst those who had positive bone growth).

Conclusion: The deep swab technique had poor reliability in guiding initial or subsequent targeted antibiotic therapy in the acutely infected osteomyelitic diabetic foot requiring hospitalisation. We believe, early bone sampling should remain the mainstay for guiding antibiotic therapy. Efforts should be focused on early surgical infection clearance and bone pathogen isolation. Delays to surgery may increase the possibility of no growth in bone specimens. When surgical debridement is contraindicated or access to theatre is difficult, deep swab cultures may only reliably inform in a select few and positive growth results need to be viewed with caution.

[007] PROSPECTIVE ASSESSMENT OF WHITE BLOOD CELL SPECT/CT IN MONITORING ANTIBIOTIC TREATMENT IN PATIENTS WITH DIABETIC FOOT OSTEOMYELITIS

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Aim: Osteomyelitis is a risk factor for lower extremity amputation in diabetic people. Antibiotic therapy allows a remission in 60 to 80% of cases. However the optimal duration of antibiotic therapy remains controversy due to the absence of validated marker of osteomyelitis remission. We have previously shown that the negativity of white blood cell SPECT/CT imaging at the end of treatment allowed to predict remission of osteomyelitis at 1 year in all cases. A positive imaging was associated with recurrence in 70% of cases. The aim of our study was to evaluate prospectively the interest of white blood cell SPECT/CT to set the duration of antibiotic therapy.

Method: Patients with a clinical and radiological diagnosis of osteomyelitis were included in two diabetic centers between April 2014 and January 2016. On the 56 patients included, 40 had a follow-up longer than 6 months. White blood cell SPECT/CT was performed after 6 weeks of appropriate antibiotic therapy. In the absence of abnormal uptake, antibiotic therapy was discontinued. In case of abnormal uptake antibiotic therapy was continued for a total of 12 weeks and then stopped after a new SPECT/CT. Remission was defined as the absence of recurrence of osteomyelitis on the same location at 6 months.

Results/Discussion: The location of osteomyelitis was mainly a toe (46%) or a metatarsal bone (49%). The mean duration of the wound was 18 ± 32 weeks. The mean number of microorganism was 2.6 per cases. Staphylococcus aureus methicillin-sensitive was found in 55% of cases and there was no strain of Staphylococcus aureus methicillin-resistant. Antibiotics were stopped at 6 weeks in 50% of cases according to a negative white blood cell SPECT/CT. Abnormal uptake persisted at 12 weeks in 60% of the 20 patients with abnormal uptake at 6 weeks. No recurrence was observed at 6 months for all cases with a negative SPECT/CT at 6 or 12 weeks. For cases with an abnormal uptake at 12 weeks, the recurrence rate was 50% after a median delay of 4 months (2-7). The total remission rate was 85%.

Conclusion: These preliminary results using white blood cell SPECT/CT in monitoring antibiotic treatment of diabetic foot osteomyelitis show that at least 50% of patients are in remission after 6 weeks of antibiotic therapy. Despite the extension duration of antibiotics, 30% present an osteomyelitis recurrence. These data are in line with the new recommendations of IWGDF who advocate that a 6 weeks antibiotic therapy in diabetic foot osteomyelitis would be sufficient for most of the patients.

[O08] ASSESSMENT AND COST ANALYSIS OF THE HYPER ACUTE DIABETIC FOOT SERVICE TO MANAGE THE SEVERE FOOT ATTACK

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Aim: Assessment and cost analysis of the hyper acute diabetic foot service to manage the severe foot attack. An acute severely infected diabetic foot is now being considered the equivalent of a myocardial infarction (MI). Today, many acute services e.g. (Stroke, MI) are housed in specialist centers in the UK. We report the development of a specialized acute multidisciplinary management team or hyper acute unit consisting of a dedicated diabetologist, orthopaedic & vascular surgeon and in-patient podiatric practioner.

Methods: In November 2013 thought was given to service development; in May 2014 our service leads (ME, VK, MB) implemented acute pathways for new colleagues following staff expansion. Clear pathways were established for severe acute infection in the non-ischaemic compromised foot that required acute surgery. An emphasis was placed on rapid access to surgery and multi-disciplinary care, ensuring good communication, continued training & on-going audit.

All patients requiring surgical debridement for acute non-ischeamic infection between November 2013 and April 2015 were included and prospectively followed. Our exclusion criteria included all non-acute admission including those requiring surgical reconstruction. We continually recorded demographic details, clinical indices, severity of infection through biochemical markers (CRP, WCC) and diabetic status (HB1Ac) from admission. During the admission episode we recorded Time to Surgery (TTS), Length of Stay (LOS) and Number of Debridement's Per Hospital Episode (NDHE).
Statistical analysis was undertaken in 3-month periods from Nov 2013 covering 6 quarters and conducted using a Student's T – test between time groups. Cost analysis was undertaken using standard NHS England tariffs in 2014 -15.

Results: 60 patients were found to meet the inclusion criteria in that period. On average there were 11.3 (9-16) admissions per quarter, mean age was 57.6. Mean CRP at presentation was 125.2 (72.2-170.2); WCC was 11.6 (10.5 – 12.5); HB1Ac on admission was 10.68 (7.28-11.23). No difference in admission age, CRP, WCC and HBA1c was detected between each quarter (P<0.05).
Prior to service re-development implementation, admission TTS in Aug 2013 was as high as 7 days and the LOS in the first 6 months of the study was 56 days (51.8 – 60.2 days). Following a 3 month period of implementation both LOS & TTS fell in the proceeding 2 quarters. The TTS reduced from a mean of 6 days to 1 day in the final 6 months of observation. LOS fell sequentially to a mean of 28 days in the last quarter; providing a maximal improvement of 22.2 days in the observed time & surgical debridement (NDHE) fell from 2.0 per hospital admission to 1. No patient to date in this group has undergone major amputation on the affected limb.
During the first year, of the study 47 patients required the hyper acute diabetic foot service, the improvement in LOS demonstrated would have led to a potential cost savings of up to £302,586 per annum; the additional reduction in theatre usage would add £29,892 per annum; a combined cost saving of £332,478 per annum.

Conclusion: Joint Multidisciplinary working & early access to surgical debridement are observed to reduce multiple procedures and risk of multiple anaesthetics. Concurrently a reduction in LOS has been achieved with no increased risk of early major amputation. Thus a hyper acute service may improve clinical-efficiency; we would recommend further evaluation of this concept and service.

[O09] DECREASE IN (MAJOR) AMPUTATIONS IN GERMAN DIABETICS - A SECONDARY DATA ANALYSIS BY AOK RHEINLAND/HAMBURG

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Aim: In two German regions with 11.1 million inhabitants, 6 networks for specialized treatment of DFS were implemented between 2002 and 2008. Data provided to the largest insurance company for accounting purposes was analyzed in order to determine changes in amputation rates as well as changes in the rate of diabetics requiring amputations in the years before and after the implementation of these networks.

Method: Data covering 2.9 million insured people collected during the years 2007–2013 was analyzed. For each region, the diabetics, their age, gender, and amputations were analyzed by the use of log-linear Poisson regression.

Results/Discussion: The rate of diabetics needing major amputations fell significantly by 9.5% per year ($p < 0.0001$) from 217 to 126 of 100,000 patients per year. The rate of diabetics needing amputations of all kind fell from504 to 419 of 100,000 patients per year ($p = 0.0038$).

This clear decrease was concomitant to structural changes in health care due to networks for specialized care being provided with extra funding, as well as disease management programs. The networks integrate health care providers such as diabetologists, surgeons, nurses, orthopedic shoemakers, podiatrists, and other professionals in an organized system of shared care. They also organized awareness campaigns, educated community nurses and general practitioners, to provide second opinions before a major amputation, and used various media to spread information about DFS.

Conclusion: At the end of the observation period, the rate of diabetics requiring amputations was still high. For this reason, further expansion of organized specialized care is urgently needed.

[O10] INCREASING AGE AND UNDERLYING RENAL PROBLEMS ARE THE MAIN FACTORS FOR INCREASED MORTALITY IN DFU

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Aim: Diabetic Foot Ulcer (DFU) is associated with high mortality. The literature suggests that about 50% of subjects will die within 5 years of developing foot ulcer. The most common reason for death is cardiovascular disease. We wanted to study if there was high mortality in subjects with diabetic foot ulcer who attended our multi-disciplinary foot clinic with DFU. The aim of this study was to analyse the mortality rate in subjects who presented with diabetic foot ulcer in our multi-disciplinary foot clinic and to analyse risk factors associated with it.

Method: This was a retrospective audit on a randomly selected clinic population. Out of 2500 eligible subjects, 200 subjects with NHS number beginning with 4 were randomly selected. The date when they first came to the clinic was collected in the case of subjects who had multiple episodes of ulceration. Their status was noted in 2016 as dead or alive. If dead, the year of death was noted. This project was registered with the local regulatory board.

Results/Discussion: A total of 204 electronic patient records were studied on subjects who presented to the foot clinic from 2003 to 2013. Out of this cohort 70 (34.3%) subjects died [mean age of death 71 (+/- 8.5) years] at the median follow up point of 8 years following the first recorded episode of DFU. Further breakdown of this data, we found that 51.4%, 41.8%, 28.6% and 23.1% died at median follow up of 12 years, 9 years, 6 years and 3.5 years respectively. Subjects who died were older [67.0 (+/-8.8) years vs 64.2 (+/- 8.5) years; p = 0.02]. Out of all subjects 125 (61.3%) were males, but there was no gender difference in mortality (p>0.05) in this cohort. We also did not find any difference (p>0.05) in baseline cholesterol between subjects who died and those who were alive [4.1(+/-1.3) mmol /L vs 4.2 (+/-1.2) mmol/L]. There was also no difference in HDL cholesterol and HbA1c at baseline. The serum creatinine level was significantly higher in subjects who died [115.3 (+/- 54.3) vs 97.3 (+/- 43.3) micro-mol/L; p = 0.01] along with raised urinary albumin creatinine ratio [36.7 (+/-93.5) vs 12.6 (+/- 33.1); p = 0.001]. Four subjects with DFU were undergoing dialysis and all of them died during follow up.

Conclusion: Our recorded mortality is lower than published series. This is possibly due to aggressive treatment of cardiovascular risk factors in our cohort. We found that underlying renal problems were associated with increased mortality. Our study is limited by our inability to analyse cause of death as most patients died long after their care episode was complete with our team. Further studies are needed to analyse if mortality has improved in DFU with aggressive treatment of cardiovascular risk factors.

[O11] CLINICAL AND MICROBIOLOGICAL OUTCOMES AFTER SEQUENTIAL LOW-FREQUENCY ULTRASOUND WOUND DEBRIDEMENT OF NEUROISCHEMIC DIABETIC FOOT ULCERS

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Aim: To evaluate the effectiveness of wound debridement with low-frequency-ultrasound used in combination with a super-oxidized solution to remove biofilms, and control bio-burden in neuroischemic diabetic foot ulcers.

Method: 17 outpatients (15 male, 2 female) with neuroischemic diabetic foot ulcers Texas 2D, which had been present for 7.26 ± 6.9 months, were involved in this single center prospective study. Ulcer treatment included weekly sessions with low-frequency ultrasound (LFUS) used in combination with a super-oxidized solution during six weeks treatment time. Moist wound dressings were applied between debridement procedures. Soft tissue punch biopsies (3mm) were taken before and after each debridement session for qualitative and quantitative microbiological analysis. Wound conditions were assessed weekly using a validated wound scoring method.

Results/Discussion: Analysis of tissue samples showed poly-microbial bacterial presence in 70% (n=12), and mono-microbial bacterial presence in 30% (n=5) of our patients. Seven different bacteria species were isolated including biofilm builders such as Pseudomonas aeruginosa. A significant reduction of bacterial presence was detected after each debridement session, with 5,7 ± 1,6 vs. 4,5 ± 1,6 Log CFU/g tissue (p<0.001) after the first; 6,2 ± 1,8 vs. 4,4 ± 1,9 Log CFU/g tissue (p=0.005) after the second, and 5,2 ± 1,1 vs. 4,1 ± 1,7 Log CFU/g tissue (p=0.008) after the third debridement session. The mean total bacterial load reduction before and after debridement sessions was 5,57±1.1 and 4,3 ±1,5 Log CFU/g tissue (p<0.001) respectively. The mean relative bacterial load reduction effect after each LFUS debridement session was 1,26 ± 0,9 Log CFU/g tissue after the first, 1,763 ± 1.8 Log CFU/g tissue after the second and 1,1 ± 1,1 Log CFU/g tissue after the third session. As a result of significant reduction of bacterial presence, wound conditions improved markedly showing significant differences in wound scoring (Wollina score) between patient admission and end of treatment with 2.58 ± 1.2 vs. 5.08 ± 1.92 scoring points (p<0.001) respectively.

Conclusion: Sequential wound debridement of neuroischemic diabetic foot ulcers with LFUS used in combination with a super-oxidized solution reduces bacterial load significantly, not only right after debridement but also during the complete period of treatment in a cumulative way. Sequential wound debridement with LFUS improves wounds conditions, which can be associated with a decreased bacterial load. Measured effects of significant bacterial load reduction are independent to the bacterial species, acting in the same way against every type of bacteria, including resistant bacteria strains. Sequential wound debridement with LFUS can avoid the use of antimicrobials and antibiotics and therefore reduce the probability of bacteria to develop resistance.

[O12] COST-EFFECTIVENESS ANALYSIS OF CUSTOM-MADE FOOTWEAR ON FOOT ULCER RECURRENCE IN PATIENTS WITH DIABETES IN THE DIAFOS TRIAL

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Aim: To determine the cost-effectiveness of offloading-improved custom-made footwear to prevent plantar foot ulcer recurrence in high-risk patients with diabetes mellitus.

Method: 171 neuropathic diabetic patients with a recently healed plantar foot ulcer were randomly assigned to 1) custom-made footwear which was evaluated, optimized and monitored at 3-monthly visits based on in-shoe plantar pressure management and analysis or 2) custom-made footwear, which was evaluated according to usual care. Primary outcome was plantar foot ulcer recurrence in 18 months. The economic evaluation was designed as a cost analysis with the cost-saving potential of the intervention as the primary outcome. For this analysis data from the DIAFOS trial was used. Healthcare costs included the costs of the intervention (input) and treatment costs of a recurrent plantar diabetic foot ulcer (output). Bottom-up micro costing was used to quantify intervention costs. These costs included the time investment of the footwear technician to modify the footwear, the sum of the observed volume of footwear modifications multiplied by their respective unit costs, footwear materials costs, and costs for the purchase (effectively write-off), maintenance and time use of the in-shoe plantar pressure measurement and analysis. Time investment was multiplied by gross salary. The average total for direct and indirect treatment costs of a foot ulcer were derived from existing data from the Eurodiale study.

Results/Discussion: On the basis of intention-to-treat, 33 of 85 patients with improved footwear and 38 of 86 patients with usual care had a recurrent ulcer (relative risk -11%, P=0.48). A total of 1183 footwear modifications in a mean 1.2 rounds of modifications per shoe pair per visit per patient were made in the improved footwear group; 33 footwear modifications were made in the usual care group patients. The total expenditures for the intervention were € 38.507 for the intervention and €206 for usual care. Average costs for treatment of a foot ulcer are €10.091. Offloading-improved custom-made footwear led to lower costs since its effectiveness offsets the added costs of the intervention and was cost-saving by €12.121.

Conclusion: Based on exact data for the intervention costs and reference data for ulcer treatment costs, offloading-improved custom-made footwear seems cost-effective compared with custom-made footwear that does not undergo such improvement. Although the DIAFOS trial could not demonstrate a significant risk reduction, accompanying cost-savings might still turn offloading-improved custom-made footwear into a treatment of first choice for the prevention of plantar foot ulcer recurrence in high-risk diabetic patients.

[O13] PATIENTS' ADHERENCE TO CUSTOMIZED DIABETIC INSOLES AS OBJECTIVELY ASSESSED BY A TEMPERATURE SENSOR

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Aim: Customized diabetic insoles reduce the mechanical stress by re-distributing pressure to the plantar tissue. Thus, customized diabetic insoles are an effective means to prevent the reoccurrence of neuropathic diabetic foot ulcerations. However, the efficacy of these insoles is highly dependent on patients' adherence. By recommendation, patients should wear their customized diabetic insoles as much as possible for the prevention of diabetic foot problems. However, adherence data often rely on self-report since objective parameters are not available. The aim of this study was to objectively assess patients' adherence with a temperature sensor directly incorporated into their insoles.

Method: In a pilot study, the cut-off value for optimal temperature was determined that differentiates between wearing and not wearing footwear. For this purpose, a ROC analysis was conducted that yielded an area under the curve of.996 ($p<.0001$). A cut-off value of 25° Celsius was determined that achieved a sensitivity of 95.3%, a specificity of 99.8%, a positive predictive value of 98.7%, and a negative predictive value of 99.2%. In the main study, temperature sensors were incorporated into the specialized diabetic insoles of 26 patients with type-2-diabetes and diabetic foot syndrome (age: 67.5±10.8 yrs.; 35% female; BMI: 30.3±4.7 kg/m^2; diabetes duration: 10.4±6.8 yrs.; HbA1c: 7.7±0.6%).

Results/Discussion: On average, data from 133.5 days per patient could be analysed. Patients wore their diabetic footwear (temperature>25°C) on an average (median) of 3.4 hours per day (inter-quartile-range (IQR): 0.5 - 6.9 hours/per day). On an average (median) of 51% of days, patients did not wear their diabetic footwear (IQR: 16.9 - 81.8%).

Conclusion: Wearing time of diabetic insoles and other specialized diabetic footwear can be objectively and validly assessed by temperature sensors. This study offers objective data regarding patients' adherence to their customized diabetic insoles. Nearly every second day, patients did not wear their insoles at all. Results of this study indicate that the utilization of specialized diabetic footwear is suboptimal in order to prevent re-ulcerations and other diabetes foot problems. Future studies should examine how the adherence of patients with a high risk for foot ulcerations can be enhanced, e.g. by patient education or technological assistance or reminders.

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[014] PERCUTANEOUS NEEDLE FLEXOR TENOTOMY OF HAMMER, MALLET AND CLAW TOES IN THE DIABETIC PATIENT

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Aim: Diabetic foot ulcer is a costly complication, prevention and prompt treatment is important to reduce the risk of infection, minor and major amputations. The aim of the study was to examine the effectiveness of a modified minimally invasive flexor tenotomy technique performed with needle, to prevent and heal toe ulcers in diabetic patient with claw, hammer and mallet toe deformities, seen in our multidisciplinary outpatient clinic.

Method: Patients referred from podiatrist to orthopedic surgeon between 17th Feb. 2015 and 23th Feb. 2016 that underwent percutaneous needle tenotomy of the deep and superficial flexor tendons of the toes. The surgical procedure was performed in local anesthetics. The tenotomy was Performed with a needle, with a diameter of 1,2 mm, and length of 40mm. The needle was introduced through the skin immediately proximal to the web level, in the toe chosen for tenotomy, corresponding to the placement of the deep and superficial flexor tendons. All patients were offered therapeutic sandals and seen at 2 and 7 days post intervention.

Results/Discussion: 42 patients had 135 toes treated by percutaneous tenotomy, 16(12%) toes with ulcers and 119(88%) toes with impending ulcerations were treated. Average age was 66.02 years (41-89 years), 30 (71%) were males, average diabetes duration was 24,69 years (6-70 years), 28 patients had type 2 diabetes (66,6%), average BMI were 29,9 kg/m^2 (18,9-41,6 kg/m^2), HbA1c 63,23 mmol/mol (33-96 mmol/mol), total cholesterol 4,7 mmol/L (1,4-9,4 mmol/L) and blood pressure 135/75 mmHg (97-200/56-96 mmHg), 4 patients were smokers (10%). Total loss of vibration sense (>50 volt) was observed in 57% off right and 55% of left feet, palpable foot pulses were found on right foot in 36 patients (86%) and 38 on left foot (90%). Retinopathy was present in 5 patients (12%). Ualbcrea ratio was 92,4 (3-920).

All surgical incisions healed uneventfully, 41 patients after 2 days (98%), and one patient after 7 days (2%). No complications, e.g. bleeding or pain were recorded. There were 12 neuropathic (75%), 3 neuro-ischemic (19%) and 1 ischemic ulcer (6%). The average duration of ulcer before tenotomi was 6,5 weeks (1-26 weeks), all ulcers (16) healed in the observation period, in a mean of 24 days (2-105 days). There was no recurrence of toe ulcer in the period. No infection was recorded and no amputations performed due to the procedure. Eight patients had transfer complication (19%), with a total of 12 toes affected. 4 toes had transfer ulcers (33%), and 8 incurred pressure signs (67%) after the primary tenotomy. One patient underwent re-tenotomy due to insufficient primary procedure (2%). Mostly the tenotomy was performed on right foot 90 toes (67%). The tenotomies performed were distributed on: first toe 22 (17%), second toe 37 (27%), third toe 34 (25%), fourth toe 23 (17%) and fifth toe 19 (14%). 6 patients (14%) needed assistance from home nurse to change the dressing or wound observation after the procedure. 28 patients (67%) were treated with handmade shoes with rocker bottom to prevent future ulcers.

Conclusion: Needle tenotomy is a simple, safe and effective procedure for preventing and/or treating ulcers of claw, mallet and hammertoe deformities in diabetic patients. This off-loading surgery should be offered all patients at-risk of ulcers of a hammer, mallet or claw toe. The procedure can result in transfer ulcers if not performed on all toes of one foot at same primary intervention. Flexor tendon tenotomy of the first toe can present a challenge, likely due to the caliber of the tendons, and relation to the sesamoids. The follow-up period was relatively short, and further investigation is needed, and will be carried out at our center.

[O15] A REVIEW OF THE IMPACT OF A NEW FOOTCARE INTERVENTION PROGRAMME CARRIED OUT IN TWO HAEMODIALYSIS UNITS IN NOTTINGHAM, UK

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Aim: Each year a significant number of individuals with diabetes undergoing haemodialysis (HD) suffer foot conditions that result in a hospital admission, or at worst, amputation of a limb. In light of this, a two-part diabetic foot intervention programme was initiated on two HD units based on an acute hospital site in Nottingham, UK. This review aimed to establish whether these interventions had any effect on major and minor amputation rates, bed days/cost for foot related problems, access and frequency of preventative podiatry care and patient satisfaction. The review also aimed to assess the cost of providing the service, as well as monitor the level of referrals from the dialysis units to the local diabetic foot MDT and other specialisms for foot problems.

Method: The first intervention involved training dialysis nurses to carry out 8-weekly foot checks on the HD units. The training also provided referral details for the diabetic foot MDT, and a patient questionnaire aimed at assessing current foot health behaviour. The second intervention involved establishing a regular four-weekly podiatry service on both the HD units. Provided by specialist podiatrists, the service comprised routine podiatry care, footwear advice, self care advice, monitoring of pressure areas and ongoing vascular and neurological assessment. It also allowed for referral where necessary to other services such as vascular surgeons, orthotists, district nurses for pressure relief and the diabetic foot MDT. To measure feedback, a questionnaire was completed by the patient before and after the provision of the programme to assess whether access to podiatry and frequency of treatment had altered.

Results/Discussion: The amount of bed days and major and minor amputations for patients attending these haemodialysis units over four years is shown below:

Year	Stage of programme	No. patients admitted for foot disease	No. of bed days	Cost of bed days	Amputations during admissions
01/04/2012 – 31/03/2013	Prior to any intervention	7	152	£60,800	2 minor (forefoot)
01/04/2013-31/03/2014	Nurse led foot checks 08/2013 -02/2014	6	86	£34,400	1 minor (toe)
01/04/2014 – 31/03/2015	Podiatry begins 11/2014	7	377	£150,800	2 major (AKA) 3 minor (1 forefoot, 2 toe)
01/04/2015 – 31/03/2015	Ongoing Podiatry	1	8	£3,200	0

Patients reported satisfaction with the service. Referrals from the HD units to the diabetic foot MDT and other specialisms went from 0 prior to the intervention, to 35 referrals from dialysis nurses and 28 from podiatrists in the following 24 months. The staff cost of providing the service on the dialysis units per year was found to be 25% less than providing the service in the community (£2,667 compared to £3,523).

Conclusion: The foot care intervention programme appears to have resulted in a drop in amputations and bed days amongst HD patients, as well as resulting in frequent referrals to the diabetic foot MDT and other specialisms. It has been more cost effective to provide the podiatry service on the HD units than clinics and patient's homes.

[O16] CHARACTERISTICS OF NEW-PATIENT REFERRALS TO SPECIALIST DIABETES FOOT CARE SERVICES ACROSS EUROPE

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Aim: There are different models of healthcare structures across Europe, with different referral pathways to specialist diabetic foot care services. We aim to analyze the referral patterns, indication and characteristics of new patients to different specialist diabetes foot services across Europe.

Method: We conducted a survey of all new patient referrals to 10 specialist diabetic foot centers in 5 countries, namely France, Germany, Italy, Spain and England. A standardized questionnaire was designed to collected data on demographics, source of referral, reason, duration of problem and wound characteristics if present. Data on consecutive new patient appointments was collected simultaneously in all centers over a 13 week period, from July to September 2015. Data reported as Mean±SD and comperism of proportions.

Results/Discussion: There were 569 patients included in the survey from the 10 centers. Italy had the highest representation with 38.3% of patients, then England with 27.6%, 18.5% from Spain, 10% from Germany and 5.6% from France. The overall mean age was 65±13 years, 64% male, 79.8% had Type 2 Diabetes, 15.6% with Type 1 Diabetes and 4.6% did not have diabetes. Most patients were referred from other specialist, 46.2%, then referrals from the General Practitioner (GP) 25%, then self-referrals 14.6%, then 14.2% from podiatrist. Foot ulceration was cited as the most common active problem for referral, representing 59.9% of referrals, followed by 25% for intact-ischeamic foot and 15.2% with either acute Charcot arthropathy or its complications. Of those presenting with ulceration 59.4% had a Texas Wound Classification of 1b and above, and 35.6% had moderate or severe infection as per the IDSA infection grading. Overall 53.8% presented after having the problem for more than 1 month, only 8.4% had presented within a week of current foot problem.

Conclusion: This survey demonstrated that a majority of the patients presented after a month or more to the specialist foot service, with a severe clinical grade of pathology. This could represent a missed opportunity for early specialist intervention. Thus, more studies are warranted to further delineate the possible causes of these late referrals which are apparent across all centers surveyed.

[O17] EFFECTIVENESS OF TREATMENT IN NETWORKS PRACTICING SHARED CARE FOR PEOPLE WITH DFS

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Aim: The German, nationwide insurance company DAK concluded in 2008, in the region of Northern Rhineland, contracts with 70 diabetologist centers certified according to the German Diabetic Foot Working Group. Northern Rhineland is a region with approximately 9.550.000 inhabitants. The centers together with surgeons, specialized nurses, podiatrists and shoemakers form 5 regional networks of shared care with enhanced quality insuring measures. Each network covers a region of 1-3 million inhabitants. In 2015 DAK analyzed reimbursement data to answer the question, whether specialized care in a network is associated with less amputations than treatment outside a network. The secondary aim was to assess the costs inside and outside the network.

Method: In a retrospective analysis, data of 1052 people with active DFS (wounds or active Charcot foot) starting treatment from 01.01.2009 to 30.06.2014 was analyzed. The control group was found among other people insured by DAK using matched pairs found by propensity score matching. This accounted for an equal distribution of factors such as sex, age and overall burden of diseases.

Results/Discussion: In the network treatment 14 major and 182 minor amputations had been reimbursed. Outside the networks the figures were 40 (p: 0,0004) and 203 (p: 0,28). The major contributors to costs were hospital stays (1351/1655 in/out in Euro in the quarter of the begin of therapy), drugs (423/430) and medical costs in outpatient facilities (583/389). Costs could be analyzed for a period of up to 5.5 years and were slightly higher in the first 2 quarters and slightly lower for 4 quarters thereafter without significant difference between both groups.

Conclusion: Treatment in specialized and certified centers organized in networks applying shared care reduces major amputations significantly by two third and minor amputations not significantly while costs do not differ.

[O18] PREDICTION MODEL FOR PLANTAR FOOT ULCER RECURRENCE IN HIGH-RISK DIABETES PATIENTS

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Aim: The aim of this study was to construct a prediction model for plantar foot ulcer recurrence in high-risk diabetes patients, and to internally validate its predictive performance.

Method: Data were retrieved from a multicenter randomized controlled trial on plantar foot ulcer recurrence (n = 171).[1] Demographic and disease-related data, barefoot and in-shoe peak plantar pressure, footwear adherence, and daily walking activity were entered in a multivariate logistic regression analysis. Variable selection was based on correlation analysis and the Akaike information criterion. Two logistic regression models were created, the first on all plantar foot ulcers (intention to treat, ITT), the second on all plantar foot ulcers from unrecognized repetitive stress. Performance was assessed by the area under the receiver operating curve (AUC, score 0-100), calibration graphs, and the Brier score (0-1). Internal validation was done by bootstrapping based on 1000 resamples.

Results/Discussion: The linear predictor of the first model on 71 patients who had a recurrent plantar foot ulcer in 18 months follow-up was: -0.92 + 0.82 * Living alone + 0.039 * Months duration of a previous ulcer – 0.05 * Variation in 7-day measured daily stride count + 1.59 * Presence of a minor lesion (abundant callus, blister, hemorrhage). The AUC was 0.72, and Brier score 0.21. The linear predictor of the second model on 41 patients with a recurrent ulcer from unrecognized repetitive stress was: -1.85 + 0.031 * Months duration of a previous ulcer – 0.071 * Number of months that the previous ulcer was healed + 2.0 * Presence of a minor lesion. The AUC was 0.78, and Brier score 0.16. Both models produced predicted probabilities from under 1% to more than 90%. The calibration graphs showed for the first model no marked deviations between the predicted and observed probabilities, the second model displayed some deviation in the middle range of the predicted probabilities.

Conclusion: These are the first prediction models for plantar foot ulcer recurrence. Based on the above-mentioned variables both models showed a fair discrimination ability between no ulcer and ulcer recurrence. Even so both models can predict ulcer recurrence with a risk score between 1% to more than 90%. The models may have utility in informing patients about future risks and guide doctors and patients in joint decision making on further treatment and follow-up.

[1]Bus SA, Waaijman R, Arts M, et al. Effect of custom-made footwear on foot ulcer recurrence in diabetes. Diabetes Care. 2013;36:4109-16.

[O19] IS TRANSCUTANEOUS OXYGEN PRESSURE A SUITABLE MEASUREMENT METHOD FOR ASSESSMENT OF THE EFFECT OF CELL THERAPY ON CRITICAL LIMB ISCHEMIA IN DIABETIC PATIENTS?

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Background: Some patients with critical limb ischemia (CLI) could obtain therapeutic benefit from autologous cell therapy by the use of bone marrow-derived mononuclear cells. The main goal of cell therapy of CLI is improvement of limb ischemia, therefore transcutaneous oxygen pressure ($TcPO_2$) should be the main parameter evaluating the effect of this procedure. The aim of our study was to compare $TcPO_2$ values measured on the foot treated by cell therapy to the $TcPO_2$ changes on the contralateral foot and, also, to the reference spot on the clavicle.

Methods: Thirty-three diabetic patients with chronic CLI (defined by $TcPO_2$ before treatment < 30 mm Hg on the treated foot) undergoing autologous cell therapy in our centre between January 2008 and February 2015 and with both limbs assessed were included in the study. $TcPO_2$ was measured before and at 1, 3 and 6 months after the procedure. The reference measurement spot was on the clavicle.

Results: $TcPO_2$ increased significantly in the treated foot after 1, 3, and 6 months from 17.7 to 30.4 ($p < 0.01$), 39.9 ($p < 0.001$), and 42.2 mm Hg ($p < 0.001$), respectively. $TcPO_2$ values in the control limb were without significant changes after 1, 3, and 6 months (NS). The changes of $TcPO_2$ compared to baseline values between treated and control limbs were significantly different after 3 months (23.1 vs 4.2 mm Hg, $p = 0.0005$) and 6 months (29.4 vs 11.7 mm Hg, $p = 0.013$); the difference after 1 month was non-significant (12.1 vs 4.8 mm Hg, $p = 0.069$). Pearson´s chi-square test of improved/impaired values between both feet revealed a significant improvement of the treated foot compared to the control one ($p = 0.002$). The reference spot for $TcPO_2$ measurement on the clavicle was without significant changes at all measured intervals (56.3 ± 11.4, 57.5 ± 7.5, and 58.1 ± 9.5, NS) compared to baseline (56.1 ± 9.6). The foot/clavicle index from baseline to 3 months was significantly increased on the treated foot (from 0.33 to 0.71, $p < 0.001$), whereas the control limb was without a significant difference (from 0.67 to 0.65, NS).

Conclusion: Our study showed a significant increase of $TcPO_2$ on the treated limb with no-option CLI and no $TcPO_2$ changes on the contralateral limb or on the reference measurement spot. $TcPO_2$ proved to be a suitable method for assessing the effect of autologous cell therapy.
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[O20] SEVERITY OF FOOT PATHOLOGY (IWGDF CATEGORIES 2 AND 3) SHOWS THE STRONGEST ASSOCIATION WITH MORTALITY IN DIABETES

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Background and aims: Little is known on the association of foot lesions (amputations, ulcerations) and diabetic vascular complications vs. cardiovascular risk factors on mortality. Thus, we carried out a prospective 5-year study to examine the impact of established vascular complications and classical risk factors on mortality in diabetic patients.

Material and methods: We included 244 patients attending a diabetes clinic during the preceding 5 years: of these, 53 (group A) had meanwhile died, and 191 (group B) are still alive. Cardiovascular risk factors (hypertension, triglycerides, HDLc, LDLc, fibrinogen, proteinuria, smoking), diabetes duration, macrovascular disease [coronary artery disease (CAD), cerebrovascular disease (CeVD) and peripheral arterial disease (PAD)] were assessed. Peripheral neuropathy diagnosed by the Neuropathy Disability Score (NDS), and retinopathy was diagnosed by funduscopy. Vibration perception threshold (VPT) and Neuropad time to colour change were studied as well. The International Working Group on the Diabetic Foot (IWGDF) risk categorisation was used to quantify severity of foot pathology.

Results: There were no differences between groups A and B in the following parameters: male gender [31(58.5%) vs. 94(49.2%), p=0.23], type 1 diabetes [6 (11.3%) vs. 24 (12.6%), p=0.80], HbA_{1c} (8.9%±2.04 vs. 9.2±1.94%, p=0.17), triglycerides (1.9±1.51 vs. 1.93±1.7mmol/l, p=0.90), HDLc (1.27±0.51 vs. 1.25±0.28mmol/l, p=0.80), LDLc (3.44±0.81 vs. 3.62± 0.89 mmol/l, p=0.18), smoking [7 (13.2%) vs. 36 (18.8%), p=0.34], diabetic retinopathy [34 (64.15%) vs. 105 (54.97%), p=0.29], proteinuria (385.2±609.9 vs. 443.9±1003, p=0.23), CeVD [4 (7.55%) vs. 10 (5.23%), p=0.52], CAD [5 (9.43%) vs. 16 (8.38%), p=0.81] and combined CeVD+CHD [2 (3.77%) vs. 9 (4.71%), p=0.81]. Patients in group A exhibited significant differences in the following parameters: age at developing foot lesions (69.2±8.77 vs. 66.2±9.7years, p=0.036), DM duration (20.2±10.45 vs. 16.96±8.8, p=0.026), hypertension [42 (79.2%) vs. 117 (61.3%), p=0.015], fibrinogen (4.3±1.11 vs. 3.89±0.88, p=0.02), ankle reflexes (AR) score (3.42± 1.06 vs. 3.04±1.28, p=0.03), Neuropad response (13.8± 8.9 vs. 10.8± 7.2min., p=0.03), VPT (3.35±3.2 vs. 4.8±3.00 V, p=0.004), and IWGDF risk category (p=0.0002). However, in multivariable logistic regression analysis including risk factors significantly associated with mortality, it was only IWGDF category 2/3 that remained significantly associated with mortality (OR: 3.78, 95% CI: 1.72-8.28, p=0.001).

Conclusion: Severity of diabetic foot pathology was a stronger prognostic factor of mortality than cardiovascular risk factors. This finding underlines the importance of timely diagnosis and management.

[O21] PAINFUL NEUROPATHY IS COMMON BUT LARGELY UNDIAGNOSED IN SUBJECTS WITH AND WITHOUT DIABETES PARTICIPATING IN A NATIONWIDE EDUCATIONAL INITIATIVE (PROTECT STUDY)

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Aim: Painful distal sensory polyneuropathy (DSPN) is associated with considerable morbidity and an increased risk of mortality, but neuropathy screening is underutilized in primary care practice. We conducted a nationwide educational initiative to determine the prevalence and risk factors of diagnosed and previously undiagnosed painful and painless polyneuropathy.

Method: Among 1,589 individuals participating in the initiative, 643 had no diabetes by history (ND) (age [mean±SD]: 67.7±11.8 years, 39% male), 113 had type 1 diabetes (age: 59.4±15.6 years, 47% male), and 833 had type 2 diabetes (age: 69.7±9.7 years, 51% male). DSPN was assessed by history and foot examination including pressure (10 g monofilament), temperature (tip therm instrument), and vibration (tuning fork) perception and was classified as possible, probable, and severe if 1 of 3, 2 of 3, and 3 of 3 tests were abnormal. Painful DSPN was defined as having pain and/or burning at rest in the feet, while painless DSPN was defined as the presence of paraesthesia, numbness, or absence of symptoms. Foot pulses, HbA1c (point-of-care testing), and symptom questionnaires were determined in subsets of participants.

Results/Discussion: DSPN was detected in 49.3 (95% CI: 46.0-52.6)% of ND, 43.5 (35.4-51.9)% in type 1, and 52.9 (50.0-55.9)% in type 2 diabetes subjects. The percentages of subjects with painful DSPN were 66.7 (60.1-72.8)% in ND, 61.5 (43.6-77.4)% in type 1, and 61.8 (56.2-67.2)% in type 2 diabetes subjects. Among participants with painful polyneuropathy, the latter was reported as previously undiagnosed by 75.8 (67.5-82.9)% of ND, 28.5 (16.6-64.5)% of type 1, and 60.2 (52.5-67.4)% of type 2 diabetes participants. These rates were around 20% higher in subjects with painless DSPN. Apart from age, painful DSPN was associated with higher BMI in participants with type 2 diabetes (r=0.242; P=0.001). Among ND participants, 30.1 (26.0-34.5)% had HbA1c values of 5.7-6.4%, while 4.1 (2.5-6.4)% showed HbA1c levels ≥6.5%. Painful DSPN was associated with HbA1c in type 2 diabetes subjects (r=0.121; P=0.040) and in ND individuals who had HbA1c levels ≥6.5% (r=0.837; P<0.001).

Conclusion: Almost half of subjects with and without diabetes participating in an educational initiative had DSPN which was painful but previously undiagnosed in almost two thirds in all three groups. Since the risk of diabetes was increased in one third of participants without known diabetes, effective strategies to reveal undetected diabetes as well as neuropathy should be implemented.

[O22] MICRORNA 210 ROLE FOR WOUND HEALING IN DIABETES

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Aim: The specific therapeutically options for diabetes foot ulcers are limited because the pathogenic mechanisms for delayed wound healing in diabetes are still unraveled. Even though prolonged exposure of the tissues to hyperglycaemia is the primary causative factor for chronic complications of diabetes it has recently become increasingly evident that hypoxia plays an important role. Tissues' response to hypoxia is mediated by transcription factors called Hypoxia Inducible Factors (HIFs), which regulates various genes that adapt the cells to low oxygen concentration. In diabetes, however, the cellular response to hypoxia is impaired as a consequence of the repression of HIF-1. Reactivating the HIF signaling in diabetes is followed by improved wound healing rate despite chronic hyperglycemia. MicroRNA 210 (miR210) is a robust target gene of HIF and mediates an important part of the hypoxic response by modulating cell cycle, mitochondria metabolism with direct effects on angiogenesis and cell survival. In this study, we aim to investigate the contribution of miR 210 for the HIF signature during wound healing aiming for a potential narrower specific therapeutic target.

Method: The effect of diabetes on mir210 expression in skin and wounds was studied in two diabetic mouse models characterized by delayed wound healing: – db/db mice and streptozotocin induced diabetic mice. The wound model consists of full-thickness wounds made on the dorsum of the animals. The wound area was determined every second day using a digital camera. The modulation of miR210 by glucose and oxygen was investigated in human dermal fibroblasts (HDF) cultured in normal (5mM) and high (30mM) glucose concentrations exposed to normoxia (21% O_2) or hypoxia (1% O_2) for 24 hours. The expression of mir210 was evaluated both in vitro and in vitro by qPCR. The direct influence of mir210 for wound healing in diabetes was studied in mir210 knockout mice where diabetes was induced by streptozocin (50mg/kg i.p for 5 days). The wound model consists of full-thickness wounds made on the dorsum of the animals. The wound area was determined every second day using a digital camera.

Results/Discussion: In concordance with the HIF repression in diabetes the expression of miR210 in the skin of db/db mice was significantly reduced compared with the skin from the control mice ($p<0.01$, t-test; n=10). Moreover miR 210 was induced by 1.7 folds in wounds compared with uninjured skin ($p<0.01$, t-test; n=10) but markedly reduced in the wounds of diabetic animals ($p<0.05$, n=10). The expression of miR 210 *in vitro* followed the HIF signaling regulation being increased (8 folds) in HDF cultured in hypoxia and normoglycemia ($p<0.01$, t-test; n=5) but repressed in the cells cultured in high glucose and hypoxia ($p<0.05$, n=5). *in vitro* the wound healing rate was delayed by diabetes and further modulated by the lack of mir210 KO.

Conclusion: miR 210 is part of the HIF signature for wound healing both in diabetic and non diabetic conditions.

[O23] SCREENING OF OBSTRUCTIVE SLEEP APNEA SYNDROME WITH RESPECT TO THE INCIDENCE OF MACROVASCULAR COMPLICATIONS AND IMPAIRMENT OF MICROCIRCULATION IN PATIENTS WITH THE DIABETIC FOOT

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Obstructive sleep apnea syndrome (OSAS) is closely connected not only with diabetes mellitus, but also with cardiovascular diseases. It occurs in approximately 2-4% of the general population, the incidence in diabetic patients is much higher. OSAS is usually detected by validated tests (polysomnography), but prescreening (questionnaires) may indicate the risk patients.

The aims: of our study were to assess subjectively described sleep disorders, the possible occurrence of OSAS in patients with the diabetic foot (DF) and its possible association with macrovascular complications and the impairment of microcirculation.

Methods: We included consecutively into our study 105 patients with the DF (mean age 63±8.8years, BMI 31.2±4.7kg.m-2) who were treated in our foot clinic (1/2016-3/2016),completed screening questionnaires (for detection of OSAS Berlin questionnaire-assessed three domains, at least 2 must be positive; STOP-Bang questionnaire stating the low, medium and high risk of OSAS; and Epworths sleepiness scale(ESS) detecting excessive daytime sleepiness),questionnaires subjectively evaluating the quality of sleep and tiredness, and in whom we performed basic anthropometric examinations (neck, waist, hips circumferences). The presence of cardiovascular heart disease (CHD was present in 28.2% of all patients with the DF), strokes(in 9.7%),peripheral arterial disease (PAD in 58.3%) and the values of transcutaneous oxygen pressure determining the microcirculation (TcPO2-an average 40.9±14.3mmHg) were examined in all study patients. Based on the results of screening questionnaires, patients were divided into 3 groups (category 1 - patients with positive Berlin and STOP-Bang questionnaires referring to the high risk of OSAS, category 2 - patients with a positive one questionnaire, category 3 - both questionnaires negative).

Results: Based on the screening questionnaires belonged to category 1 29.8% of patients (31/105), to category 2 63.5% (67/105) and to category 3 6.7% (7/105) of patients with the DF. Only category 1 correlated significantly with subjectively described awakening(p=0.03), poor quality of sleep(p=0.0064), lack of sleep(p=0.001), tired feeling(p=0.0001) and with higher excessive daytime sleepiness(ESS;p=0.0039). Selected anthropometric measurements positively correlated with category1-BMI(p=0.0012), neck circumference(p=0.001), waist circumference (p=0.0004) and hip circumference(p=0.0099). Category 1 correlated significantly only with the presence of PAD(p=0.023) but not with CHD and strokes. Compared to category 3 (0%), significantly more patients with the DF had TcPO2 below 40 mm Hg-in category 1 (62.5% of patients;p=0.017), marginally significantly in category 2 (45.6%of patients;p=0.068).

Conclusions: The incidence of OSAS is probably higher in risk group of patients with the DF. Used screening tests for OSAS correlated significantly in patients with the DF with subjectively described sleep disorders, selected anthropometric parameters, the occurrence of PAD and with the impairment of microcirculation. Therefore we should try to detect OSAS in such high-risk patient population focusing especially on patients with the DF combined with PAD and lower TcPO2.

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[O24] MR SPECTROSCOPY IN THE ASSESSMENT OF EFFECT OF REVASCULARIZATION IN DIABETIC PATIENTS WITH CRITICAL LIMB ISCHEMIA

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Aim: The standard method for assessment of effect of revascularization in patients with diabetic foot and critical limb ischemia (CLI) is transcutaneous oxygen pressure ($TcPO_2$). Magnetic resonance spectroscopy (MRS) reflects the changes of oxidative muscle metabolism. The aim of our study was to evaluate the contribution of MRS of calf muscle in the assessment of microcirculation and effect of revascularization in diabetic patients with CLI and to compare it with healthy controls.

Methods: Seventeen diabetic patients with CLI treated either by autologous cell therapy (ACT; 8 patients, mean age 62.6 ± 8.9 years) or percutaneous transluminal angioplasty (PTA; 9 patients, mean age 66.7 ± 5.4 years) in our foot clinic during 2013-2016 and 19 healthy controls (mean age 57.6 ± 9.9 years) were included into the study. $TcPO_2$ measurement was used as a standard method of non-invasive evaluation of limb ischemia. MRS examinations were performed using the whole-body 3T MR system 1 day before and 3 months after the procedure. Subjects were examined in a supine position with the coil fixed under the musculus gastrocnemius. MRS parameters were obtained at rest and during the exercise period divided into 3 parts: a two-minute rest period, a six-minute exercise period and a six-minute recovery period. The exercise was performed by the plantar flexion once per repetition time (2s) with a weight load of 7.3 kg. Rest MRS parameters of oxidative muscle metabolism such as phosphocreatine (PCr), inorganic phosphate (Pi), phosphodiesters (PDE), β-adenosine triphosphate (βATP), and intramyocellular pH were compared between patients and healthy controls. Recovery constant PCr (τPCr) and mitochondrial capacity (Qmax) were calculated from dynamic MRS. The standard T-test and ANOVA were used for statistical analysis.

Results: Patients with CLI had significantly lower PCr/Pi ($p < 0.01$) and significantly higher Pi and pH (both $p < 0.01$) in comparison with healthy controls. We observed a significant improvement in TcPO2 after both ACT (from 19.6 ± 10.4 to 32.1 ± 13.1 mmHg, $p < 0.05$) and PTA (from 31.1 ± 16 to 44.4 ± 14.4 mmHg, $p < 0.05$). However, the rest MRS parameters did not change significantly after either ACT or PTA. There was no correlation between any of the rest MRS parameters and TcPO2 values. In individual cases we observed improvement of dynamic MRS parameters but only a few patients were capable of exercise (2 out of 3 in ACT group, 3 out of 5 in PTA group).

Conclusion: Results of our study show impaired oxidative metabolism of calf muscles in patients with CLI in comparison with healthy controls. According to our results, the rest MRS parameters of calf muscle do not seem to reflect the changes after revascularization in rest, on the other hand, an improvement in dynamic MRS parameters in individual cases was observed; this finding should be verified in a large number of patients.

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[O26] IMPACT OF HEART FAILURE AND DIALYSIS IN THE PROGNOSIS OF DIABETIC PATIENTS WITH CRITICAL LIMB ISCHEMIA AND FOOT ULCER

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Aim: To establish the role of heart failure (HF) and dialysis (D) in the prognosis of diabetic patients with critical limb ischemia (CLI) and foot ulcer (FU).

Method: The study group included 104 diabetic patients with CLI and FU (man 68%/woman 32%, age 68,5±1,05 years, diabetes duration 21,5±1,2 years, mean HbA1c 64,3±2). All patients followed our limb salvage protocol and were treated by percutaneous transluminal angioplasty (PTA) of limb affected by ischemic foot lesion. According to the presence of HF and D patients were divided in four subgroups: 1) without HF and without D; 2) with HF, without D; 3) without HF, with D; 4) with HF and D. HF was considered in case of ejection fraction less than 50% or documented clinical history. D was considered in case of chronic renal replacement therapy. The most significant variables of the four groups are described. We reported 1-year outcomes expressed as: limb salvage (LS), major amputation (MA), death (De).

Results/Discussion: Overall 80 patients (77%) survived with limb salvage, 5 patients (5%) had major amputation of affected limb and 19 patients (18%) died: (10/19) 53% for sepsis, (8/19) 42% for heart complications, 1/19 (5%) for other causes. 11/19 patients (58%) died during hospitalization. There were not differences about the cause of death between the four groups. The most significant variables are respectively reported for groups 1,2,3 and 4: anemia (66.7, 100, 80.8, 93.8%) (χ=0.002), malnutrition (59, 100, 91.7, 100%) (χ=<0.0001), inability to stand or walk without help (0, 20, 15.4, 25%) (χ=0.0023), ulcer size (>5 cm^2) (63.6, 85, 69.2, 100%) (χ=0.003), lower limbs steno-obstructions (vessels) (3.9±0.2, 4.7±0.3, 4.8±0.3, 5.3±0.4) (χ=0.0054), positive procalcitonin (3.9, 25, 23, 62.5%) (χ<0.0001), hospital complication (19, 47.3, 23.1, 50%) (χ=0.03). 1-year outcomes for the groups 1,2,3 and 4 were respectively: LS (95.6, 62.5, 76, 37.7%), MA (4.4, 6.3, 4, 6.2%), De (0, 31.2, 20, 56.3%) (χ=0.0001).

Conclusion: Patients with heart failure and dialysis showed more comorbidities, more risk of sepsis and hospital-complications than patients with preserved heart and renal function. The simultaneous presence of heart failure and dialysis influences dramatically the prognosis of diabetic patients with critical limb ischemia and foot ulcer. These patients reported 1-year mortality greater than 50% and they should be considered as highest risk subjects. Close monitoring of cardiovascular complications and infections is requested.

[027] IS WIFI SCORING SYSTEM ENOUGH FOR IDENTIFYING FACTORS RELATED TO HEALING DIABETIC FOOT ULCERS IN PATIENTS WITH CRITICAL LIMB ISCHEMIA?

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Aim: Identify risk factors related to healing ischaemic and neuroischaemic ulcers in diabetic patients with critical limb ischaemia and classified according to the Wound, Ischemia and foot Infection (WIfI) scoring system in a multidisciplinary tertiary hospital unit.

Material & Methods: From February 2011 to June 2012 we collected 124 ischaemic or neuroischaemic episodes in 100 diabetic patients. In 9 ulcers out of 124, the date of the initial lesions is unknown and 7 patients from 100 were lost to follow up, therefore 115 ulcers in 93 patients has been the subject of the study. Besides the WIfI scoring, we assessed the offloading therapy, the complexity of the arterial lesions according to TASC II classification, the amputation rate and the benefit of revascularisation.

The statistical analysis to evaluate the influence of different factors concerned with ulcer healing was carried out with the SPSS vs 22.0 programme.

Results: The median time for ulcer healing was 7.65 months [95% CI 5.723-9.587].

After a Cox regression multivariate analysis the complexity of arterial lesions showed that TASC A lesions have a HR 6.6 times [95% CI 2.20-20.18] more probability to heal than TASC D. Similarly small ulcers following WIfI risk stratification system have a HR 9.99 times [95% CI 1.33-74.25] more probability to heal as compared with extensive lesions. Furthermore, no previous history of amputation has HR 13.69 times [95% CI 1.86-100.39] more probability to heal than patients who have suffered a major amputation.

A relevant positive risk factor for healing ulcers was podiatric treatment at discharge although in the multivariate analysis did not reach statistical significance. Following WIfI risk stratification ulcer, ischaemia, risk of amputation and benefit of revascularisation revealed significant for ulcer healing.

None of patients with extensive infection healed, therefore no statistical analysis was possible.

Conclusions: TASC II classification, ulcer characteristics according to WIfI classification system and previous history of amputation were independent negative risk factors for ulcer healing in our study.

Poster Abstracts

[P01] THE INVESTIGATION OF THE ANTIMICROBIAL ACTIVITY OF THE EASTERN EUROPEAN AND NEW ZEALAND HONEY TO MULTIDRUG-RESISTANT STRAINS

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Aim: To compare the activity of manuka honey from New Zealand prepared from commercial samples of approved for clinical use as a topical antibacterial agent for the treatment of diabetic foot infections and Eastern European natural honey against strains of bacteria with extreme phenotypes of antimicrobial resistance.

Method: The study involved isolates of bacteria known profile of sensitivity to antibiotics and established genetic determinants of stability for multiresistant isolates. Investigation totally included 95 strains: Acinetobacter baumannii - 22, Enterobacter cloaceae - 2, Escherichia coli - 4, Klebsiella oxytoca - 1, Klebsiella pneumoniae - 13, Serratia marcescens - 3, Pseudomonas aeruginosa - 24, Staphylococcus aureus (MRSA) - 18, Staphylococcus aureus (MSSA) - 5 further 3 control strain. The study used 6 different samples: Manuka (New Zeland), Activon Tube (New Zeland), natural honey (Demidov district, Smolensk, Russia), natural honey (Monastyrschina district, Smolensk, Russia), natural honey (Gagarin district, Smolensk, Russia), natural honey (Rostov-on-Don, Russia). Determination of sensitivity was conducted in the broth dilution method with the determination of the minimum inhibitory concentrations (MIC) of honey against test organisms. The procedure for determining the sensitivity was carried out on a special protocol comprising the following stages: prepare a solution of honey at a concentration of 30% (weight/volume) in Mueller-Hinton broth, sterilization by filtration through a 0.22 micron membrane filter, a suspension of each test isolate in sterile 0.85% sodium chloride at a density of 0.5 McFarland add to the plates using an automatic multipoint inoculator Mast UriDot (UK), the plates were incubated in a normal atmosphere at 35°C for 18-24 hours. The minimum concentration at which there was no evidence of microbial growth was regarded as MIC of honey in respect of the isolate.

Results/Discussion: The samples of commercial antibacterial agent based on manuka honey showed MIC for P. aeruginosa from 20% to 30%, 10% and 15% MIC for A. baumannii, from 7.5% to 30% MIC for Enterobacteriaceae, 5% to 30% for various phenotypes MRSA and from 5% to 15% for MSSA. Three samples of honey from Smolensk showed similar results to each other. Regarding P. aeruginosa strains from 7.5% to 15% MIC, 10% to 20% MIC for A. baumannii, from 10% to 20% MIC for Enterobacteriaceae, from 1.88% to 7.5% for different phenotypes of MRSA and from 3.75% to 10% for MSSA. Honey from Rostov-on-Don showed the worst results of all samples.

Conclusion: Honey is an effective antibacterial agent in vitro against multi-drug resistant strains of extreme collection from patients with diabetic foot infections from different hospitals in Russia. None of phenotypes has not demonstrated MIC above 30% for all the samples of honey. Eastern European honey exceeds the activity of honey New Zealand manuka for all types of microorganisms tested. With respect to individual strains MIC Eastern European honey 3-4 times lower than the MIC manuka. The difference between MIC honey from Smolensk and New Zealand may be due to γ-sterilization, which runs manuka. As a result of this procedure, some active components (antimicrobial peptides) might collapse. Honey from Smolensk can be the basis for an effective topical treatment for diabetic foot infection even in the face of MDR infection.

[P02] THE CHARCOT FOOT: AN EMERGING PUBLIC HEALTH PROBLEM FOR AFRICAN DIABETES POPULATION

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Background: Although the awareness, diagnosis, management of the complications associated with diabetes have improved in African countries over the past decade, surveillance activities in Tanzania and anecdotal reports from other African countries have suggested increasing prevalence of Charcot Foot over the past few years. Charcot foot is a very serious condition that can lead to severe deformity, disability, or, ultimately, amputation. This is of concern because of the of the potential for Charcot foot to set back the positive progress, and outcomes, including reduced rates of leg amputations, achieved by the Step by Step Foot Program in Africa.

Aim: We therefore carried out this study to (i) characterize the epidemiology and clinical burden of Charcot Foot in a large diabetes population in Tanzania; and (ii) evaluate outcomes of persons with the condition.

Methods: This was a prospective analytic cohort study. A case was defined as any person with diabetes who presented to the Muhimbili National Hospital (MNH) diabetes clinic during January 2013 through December 2015 (study period) and diagnosed Charcot Foot for the first time. Following informed consent, patients were followed up in the MNH outpatient clinic. We carried out detailed clinical assessments, and documented presence of peripheral neuropathy (PN), macrovascular disease (i.e., peripheral vascular disease, cerebrovascular, or ischemic heart disease [IHD]), and microvascular disease (retinopathy or nephropathy). Education and counseling were part of the follow-up program.

Results: Of 3,271 patients who presented to the MNH clinic during the 3-year study period, 571 (18%) met the case-definition for Charcot Foot; all case-patients had type 2 diabetes. The prevalence for each of the years 2013, 2014, and 2015 was 19/1192 (1.6%), 209/1044 (20%), and 343/1035 (34%), respectively; the increases in the slope of the trendline was statistically significant ($p < 0.001$). Of these, 374 (65%) were male. The characteristics of case-patients were as follows: median age: 56 (range: 14-92) years; median duration of diabetes 10 (range: 0-33) years; median body mass index: 26.6 (range: 18-49) kg/m2. Of the 571 study patients, 547 (96%) had PN; none had microvascular disease. In addition, none of the 147 (26%) persons with macrovascular disease had cerebrovascular disease or IHD. All 571 patients had presented with open foot ulcers—397 (70%) were Wagner stage 2, 72 (12%) were Wagner stage 3, and 102 (18%) were Wagner stage 4. Over 90% of acute these ulcers were in the midfoot region. Common precipitating factors included blisters (36%), callus (13%), prick with sharp object (9.3%), rat bites (9%); blunt trauma (7%), or burns (4%). Delay in seeking medical treatment was common (median 7 [range: 1-360]) days. Management included sloughectomy (513 [90%]) and major limb amputation (21 [4%]).

Conclusion: The prevalence of Charcot Foot disease is increasing in the Tanzanian diabetes patient population, and is strongly associated with neuropathy. Charcot Foot can lead to severe deformity, disability, and amputation. Because the risk of limb amputation, it is important that patients with diabetes seek immediate care if signs or symptoms appear and avoid delay in seeking medical attention. Early diagnosis of Charcot Foot by care givers is extremely important for successful outcomes. Warmth to the touch, redness, and localized swelling with tenderness in the feet are key clinical findings that might herald a Charcot Foot.

[P03] ANALYSIS OF 5-YEAR PROGNOSIS AND RISK FACTORS IN CHINESE PATIENTS WITH THEIR FIRST DIABETIC FOOT ULCERS

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Objective: To describe the mortality and the recurrence of diabetic foot ulcers of the following 1,3 and 5 years among Chinese patients with their first diabetic foot ulcers,as well as to investigate the risk factors of mortality and the recurrence of diabetic foot ulcers among Chinese patients with their first diabetic foot ulcers.

Methods: This is a retrospective cohort study. 204 patients with their first diabetic foot ulcers who were admitted to the Department of Endocrinology in one level 3 hospital in Guangzhou from 1 January 2004 to 31 August 2009 were enrolled in the study. They were followed up until 31 August 2014. The observing outcomes include the mortality and the recurrence of diabetic foot ulcers. The baseline data was collected in the electronic medical records, and the follow-up data was collected in the electronic medical records or by telephone interview. The data was analyzed by software SPSS version 19.0.

Results: 1. The study showed that the total mortality rate of patients with their first diabetic foot ulcers in 5 years was 41.2%, and the cardiovascular and cerebrovascular diseases were the leading causes of death (37.9%). In the study, 37 patients (18.1%), 64 patients (31.3%), and 84 patients (41.2%) died within 1 year, 3 years, and 5 years respectively. The cumulative survival rates of the patients in 1 year, 3 years and 5 years were 81.8%, 68.2% and 57.0% respectively The median survival time was 7.00 years. 2. The recurrence rates in patients with their first diabetic foot ulcers for 5 years was 34.3%, and the cumulative recurrence rates among them in 1 year, 3 years and 5 years were 18.0%, 33.9% and 39.0% respectively. The mean time between the occurance and the first recurrence was 2.28 ± 1.74 years, and the injury was the leading cause of recurrence. 3. The log-rank test results showed that the aged 60 or above, the diabetic duration 10 years or above, complicated with Hypertension, Hypoproteinemia, Diabetic Nephropathy, and Peripheral Arteria Disease, the foot ulcers 2 or above,Wagner grade 4~5, and with major foot amputation would increase the risk of death($P<0.05$). The Cox's proportional hazards model indicated that the patients' age(RR=3.877, 95%CI 2.025~7.420), complicated with Hypertension(RR=1.599, 95%CI 1.032~2.478), Hypoproteinemia(RR=1.858, 95%CI 1.235~2.794)and Peripheral Arteria Disease(RR=1.492 95%CI 1.060~2.102)were the independent risk factors of mortality 4. The log-rank test showed that smoking, diabetic foot ulcer duration 2 months or above, and complicated with Diabetic Peripheral Neuropathy were the risk factors of the recurrence of diabetic foot ulcers($P<0.05$). And the Cox's proportional hazards model indicated that smoking(RR=1.858, 95%CI 1.154~2.994), diabetic foot ulcer duration (RR=1.930, 95%CI 1.215~3.083) and complicated with Diabetic Peripheral Neuropathy RR=1.775, 95%CI 1.015~3.104 were the independent risk factors of the recurrence of diabetic foot ulcers.

Conclusions: 1. The total mortality rate of patients with diabetic foot ulcers for 5 years was at a relative high level (41.2%). The cumulative survival rates of the patients in 1 year, 3 years and 5 years decreased gradually, and the cardiovascular and cerebrovascular disease was the leading cause of death. 2. The patients were likely to be recurrenced after being diagnosed with diabetic foot ulcers firstly, and the injury was the important leading cause of recurrence. 3. The aged 60 or above, complicated with Hypertension, Hypoproteinemia and Peripheral Arteria Disease were the independent risk factors of mortality. The smoking, diabetic foot ulcer duration 2 months or above and complicated with Diabetic Peripheral Neuropathy were the independent risk factors of the recurrence of diabetic foot ulcers.

Table 1 Results from Cox regression carried out on 5-year follow-up mortality data

Variable	β	SE	Wald	P	RR	95%CI
Age	1.355	0.331	16.732	0.000*	3.877	2.025~7.420
Hypertension	0.469	0.224	4.405	0.036	1.599	1.032~2.478
Hypoproteinemia	0.620	0.208	8.851	0.003	1.858	1.235~2.794
Peripheral Arteria Disease	0.400	0.175	5.251	0.022	1.492	1.060~2.102

* $P<0.01$

Table 2 Results from Cox regression carried out on 5-year follow-up recurrence data

Variable	β	SE	Wald	P	RR	95%CI
Smoking	0.620	0.243	6.494	0.011	1.858	1.154~2.994
Diabetic foot ulcer duration	0.660	0.238	7.730	0.005	1.930	1.215~3.083
Diabetic Peripheral Neuropathy	0.574	0.285	4.046	0.044	1.775	1.015~3.104

[P04] SURGICAL MANAGEMENT OF CHARCOT DEFORMITY - INTERNAL OR EXTERNAL FIXATION?

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Aim: Charcot neuropathy (CN) is a severe joint disease that makes surgical planning very challenging, because it is combined with ankle instability, serious deformities, and recurrent ulceration. The aim of the present study was to examine the rate of bone fusion after external or internal fixation in patients with CN.

Method: We retrospectively examined 58 patients with CN who had undergone reconstruction of the ankle either with tibiotalocalcaneal or tibiocalcaneal arthrodesis. The mean age was 59.1 (range 26 to 81) years at surgery. Of the 58 patients, 38 were treated using intramedullary nail arthrodesis and 19 using an external fixator (1 patient received neither).

Results/Discussion: At a mean follow-up period of 31.3 (range 12 to 57) months, limb salvage and bone fusion had been achieved in 94.83%. The mean time to bone fusion was 12 (range 6 to 18) months. Three patients (5.2%) required a more proximal amputation. All but these 3 patients gained independent mobilization in custom feet orthoses or off the shelf orthoses. Of the 58 patients in the present cohort, 56 (96.6%) would undergo surgery again.

Conclusion: In conclusion, internal and external fixation both lead to promising results in the treatment of CN. Internal fixation should be preferred when no indications of ulcer or infection are present.

[P05] PLASMATIC SCALPEL IN THE SURGICAL TREATMENT OF DIABETIC FOOT OSTEOMYELITIS

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Aim: The aim of the study was to evaluate the outcomes of surgical treatment of diabetic foot osteomyelitis using plasmatic scalpel.

Method: We presented 79 diabetic foot cases with osteomyelitis ofmetatarsal bones. Patients were treated in General Surgery Department from 2010 till 2014.The mean age of the patients was 65±11 years. All the patients had diabetes II type. Chronic osteomyelitis was diagnosed on the basis of bone biopsy, MRI, X-ray and clinical signs. Patients were randomized in 2 groups. Surgical treatment in 1 group (n=40) included osteonecrectomy with plasmatic scalpel. In group 2 (n=39) plasmatic scalpel was not used. Postoperative regimen included antibiotics by Amoxicillin/Clavulanic acid for 14 days, immobilization for 1 month and dressings with 1% povidone-iodine solution. Follow-up period was 6 months.

Results/Discussion: Such complications as surgical site infections, recurrence of osteomyelitis and amputations were observed in group 1 in 22,5% in comparison with 35,9% in control group. The recurrence was found in 12,5% and 20,5% cases respectively. The surgical site infections were diagnosed in 10% in group 1 and in 12,8% in group 2. Amputations were performed in 0% and 2,6% cases in two groups respectively. Surgical intervention using plasmatic scalpel in diabetic patients with osteomyelitis of metatarsal bones is characterized by low rate of infectious complications, recurrence of osteomyelitis and amputations.

Conclusion: The plasmatic scalpel is an effective and safe approach to manage chronic metatarsal osteomyelitis in diabetic foot patients.

[P06] ESTABLISHING NORMATIVE THERMAL PATTERN DATA FOR THE HANDS AND FEET: A FIRST STEP IN DEVELOPING A DIABETES THERMOGRAPHY PROTOCOL

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Background: Thermography is an emergent tool for the diagnosis of foot complications in diabetes, which have been shown to alter foot temperatures. However, in order to make this a valid clinical tool, baseline data and patterns for healthy adults must be established. Thus the aim of this study was to collect normative baseline data and identify any significant differences between hand and foot thermographic distribution patterns in a healthy adult population.

Methods: Thermographic data was acquired from 50 healthy subjects using a FLIR camera for acquisition of both plantar and dorsal aspects of the feet, volar aspects of the hands, and anterior aspects of the lower limbs under controlled climate conditions.

Results: There is general symmetry in skin temperature between the same regions in contralateral limbs, in terms of both magnitude and pattern. There was also minimal intersubject temperature variation with a consistent temperature pattern in toes and fingers. The thumb is the warmest digit with the temperature falling gradually between the 2nd and the 5th fingers. The big toe and the 5th toe are the warmest digits with the 2nd to the 4th toes being cooler.

Conclusion: Measurement of skin temperature of the limbs using a thermal camera is feasible and reproducible. Temperature patterns in fingers and toes are consistent with similar temperatures in contralateral limbs in healthy subjects. This study provides the basis for further research to assess the clinical usefulness of thermography in the diagnosis of vascular insufficiency in diabetes.

[P07] AUTOLOGOUS MESENCHYMAL STEM CELLS IN TREATMENT OF RECALCITRANT NEUROPATHIC DIABETIC FOOT ULCER: RANDOMIZED CONTROLLED TRIAL

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Aim: Study the effect of locally injected autologous bone marrow mesenchymal stem cells (BM MSCs) on ulcer healing in patients with resistant neuropathic diabetic foot ulcers.

Method: Twenty patients with resistant neuropathic diabetic foot ulcers were randomly assigned to conventional treatment and proper offloading modalities alone or with added MSCs injection. Aspiration of 40cc of Patients' own bone marrow under good aseptic technique. MSCs were characterized by adherence and trans differentiation. Cultured cells were subjected to microbiological and karyotyping testing. Cultured BM MSCs were injected in the edges of the wound at eight points in day 0 and day 7. Total injected cell number ranged from one million to 2 million cells. Cases were followed for 12 weeks for size of ulcer and any local reactions

Results/Discussion: In the group of MSCs ulcer size decreased by median 49.9%(9.09%,86.6%) after 6 weeks and reached median 68.24% (3.03%-100%) after 12 weeks while the conventionally treated group ulcer size reduction was median7.67% (-30%-35%) and median 5.27% (-133.33%- 25%) respectively (P value < 0.0001)**.**Complete healing was achieved in one case in MSCs group. There were no systemic complications or local reactions to the stem cell therapy.

Conclusion: Local injection of autologous bone marrow derived mesenchymal stem cell is promising in healing of recalcitrant neuropathic diabetic foot ulcers. The procedure is safe and well tolerated by the patients. Optimum number of injected cells and frequency of injection is still to be determined.

[P08] UNDERUSE OF ORTHOPEDIC SHOES IN CHARCOT PATIENTS: ANALYZE OF THE ROUTINE CLINICAL PRACTICE

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Aim: The foot ulcer is known to be one of the most frequent complications of non-active Charcot foot (CA). We aimed to answer the questions: 1) is there an influence of wearing/non-wearing of orthopedic shoes on the development of foot ulcers in long-term follow-up? 2) Why the patient does not wear orthopedic shoes? 3) Is there a difference between CA and non-CA patients in their attitude towards wearing of orthopedic shoes?

Method: 98 patients with CA (males/females: 40/58; type 1/2: 64/34) were followed for 36 months (8-108 months). Age: 54,2±10,8yrs, duration of diabetes 24,4±13,5 yrs. Frequency of ulcers, amputations and new CA were checked. Patients were asked: "Do you need in orthopedic shoes?", "Why don't you wear your orthopedic shoes?" and "How often do you wear your orthopedic shoes?" Their answers were compared with 123 non-CA patients with high risk of ulcer.

Results/Discussion: 46,2% of patients developed 112 foot ulcers. 7 ulcers led to amputation (2 – above the foot, 5 – toes). CA of contralateral foot developed in 2 patients and 2 patients died. 16,7% of pairs of shoes was custom made and others were off-the shelf. The frequency of ulcers and all foot-related events slightly differenced in the group used orthopedic shoes and in non-users: 43,2% and 59,6% (ns). Among users 23% wear orthopedic shoes indoors and outdoors; 64% - only outdoors, 11% - only during winter and 2% - indoors. Causes of non-wearing of orthopedic footwear were: difference between foot and shoe shapes (56%), previous experience of injury with orthopedic shoes (11%), aesthetics problems (11%), living in-door only (5%) and other causes - 17%. Proportion of patients wearing the orthopedic shoes and main causes of refusal in CA and in non-CA patients were nearly the same. 52,7% of CA patients answered that they actually need in orthopedic shoes and 47,3% did not think so; in non-CA patients these answers were 80% and 20%, respectively. In fact 27% of CA patients used orthopedic shoes whereas in non-CA patients 54% used them.

Conclusion: CA patients are characterized with high probability of foot-relation outcomes. Their compliance of wearing orthopedic shoes is extremely low. Patients with CA are less compliant compared with patients without CA. The most important cause of underuse of orthopedic shoes irrespective to presence of CA is lack of custom-molded shoes. The stimulation of the production of custom shoes and psychological support appears to be the key points to increase compliance of the use of orthopedic shoes.

[P09] FACTORS ASSOCIATED WITH POSITIVE BONE CULTURES IN PATIENTS WITH DIABETIC FOOT ULCERS

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Background and aim: Osteomyelitis (OM) is a major complication in patients with diabetic foot ulcer and can be difficult to precisely diagnose and effectively treat. The aim of this study was to assess factors which could be associated with positive cultures from a bone specimen in patients with diabetic foot ulcers with respect to their medical history of previous foot ulceration, duration of antibiotic use prior to surgery, X-ray bone changes, presence of foot ischemia, long-term diabetes control, and chronic inflammatory markers.

Method: Our retrospective study included 93 diabetic patients (76M/17F, 26 Type 1/67 Type 2 DM, mean age 62±12 years) treated at a diabetic foot clinic for chronic foot ulcer Wagner 2-4 over a one-year period (Jan-Dec 2015). In all these patients, bone samples for culture were collected because of suspected OM during open surgery or by direct bone biopsy. Indications for foot surgery and bone sampling included deep chronic ulcer with the underlying bone, a positive probe-to-bone test and/or worsening of chronic wound often with cellulitis and suspected bone involvement. The following medical record data were included into the statistical analysis: history of open wound of foot, previous antibiotic use > 3 months, positive/negative X-ray bone changes, transcutaneous oxygen tension (TcPO2) on the foot dorsum, glycated hemoglobin (HbA1c) > 70 mmol/mol, and C-reactive protein (CRP) > 25 mg/l. Patients were divided into two groups according to positive or negative bone microbiology results and both groups were compared.

Results: Positive microbiology results of bone samples were obtained in 67 (72%) patients while, in 26 (28%) patients, microbiology was negative. When comparing both groups, patients with bone positive microbiologic findings had significantly more often CRP elevation (56% vs. 28%, p =0,019) and a history of > 3-month antibiotic treatment (54% vs. 12%, p < 0.0001). A non-significant trend toward uncontrolled diabetes in patients with positive bone samples was also found (33% vs 19%, NS). No differences between both groups in TcPO2 (43.7±12 mmHg vs. 44.2±13.9 mmHg, NS), positive X-ray bone changes (73% vs. 77%, NS) or previous history of ulcer or foot surgery (34% vs. 34%, NS) between patients with positive and negative bone samples were observed.

Conclusion: Based on our results, it seems that elevation of CRP, though mild, together with longer previous antibiotic treatment and unsatisfactory diabetes control may be associated with positive bone culture and predispose to chronic OM. Ischemia may contribute to persistent positivity of bone culture but is probably not necessarily a predisposing factor to it if foot TcPO2 is satisfactory. Long-term soft tissue-guided antibiotic treatment may be not effective enough to eliminate bone infection and bone biopsy is highly recommended.

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[P10] PATIENTS ON HAEMODIALYSIS HAVE A HIGHER NUMBER OF RISK FACTORS FOR DIABETIC FOOT ULCERATION

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Introduction: There is a high level of ulceration and amputation in diabetic patients with CKD stage 5. Until recently CKD stage 5 was not itself considered a risk factor in the NICE risk stratification tool. Many patients were therefore placed into the low "no risk" category and are still not accessing regular Podiatry care including preventative health education and the removal of pressure related hyperkeratotic lesions which are a contributory factor of new foot ulceration. The aim of the study was to determine if diabetic patients on haemodialysis had a higher prevalence of risk factors compared to diabetic patients without CKD5.

Methods: Patients in a Trust in the northwest region of the UK are screened on an annual basis within the GPs practices using the NICE guidance for risk stratification. 122 patients at the main haemodialysis unit were screened over a period of 3 years and compared with the patients from the local community clinics and domiciliary visits to determine if there were any significant differences between the 2 groups using the variables within the foot screening tool.

Results: 122 patients were included, 61 on haemodialysis (HD) vs 61 diabetes control (DC).There was no difference in age. Age: HD 67.7 +/- 12.7 years vs DC 68 +/- 14.2; p= NS. Significant differences (p<0.001) were found in the following risk factor variables. History of foot ulceration: HD 23 (37.7%) vs DC 2 (3.3%); p <0.0001. Current ulcer: HD 14 (22.9%) vs DC 1 (1.6%); p < 0.001. Less smokers were found in the haemodialysis group, HD 3 (4.9%) vs DC13 (21.3%); p = 0.01. Poor eye sight was five times more common, HD 32 (52.5%)vs DC 6 (9.8%);p < 0.0001. Neuropathy was two and half times more common, HD 35 (57.4%)vs DC 14 (22.9%);p < 0.001. Ischaemia was found to be four and half times more common, HD 27 (44.3%)vs DC 6 (9.8%);p < 0.0001. Statistical differences p<0.01 were found with foot deformity, HD 32 (52.5%) vs DC 16 (26.2%); p <0.01, callus and/or nail problems, HD 35 (57.4%) vs DC 20 (32.8%); p =0.01. There were more males in the HD group. Sex Male (%): HD 44(72.1%) vs 27 (44%); p<0.01. Statistically there was no difference in amputation: HD 5 vs DC 0 ; p = 0.06, however this is likely due to the fact that bilateral amputees do not have foot screening undertaken, currently the prevalence of bilateral amputees on the haemodialysis unit is 12.5% (n=4).

Conclusion: Risk factors for foot ulceration are more common in subjects undergoing haemodialysis. Patients with CKD are also more likely to have a higher number of risk factors for diabetic foot ulceration. Current foot risk stratification includes patients with CKD 5 within the high risk category but preventative care is still not targeting this vulnerable group. Further evidence is required on access to care and the independent risk factor of CKD 5.

[P11] COMMON PATHOGENS ISOLATED IN DIABETIC FOOT INFECTIONS AND RESPECTIVE RISK FACTORS FOR GRAM-NEGATIVE ORGANISMS

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Aim: The current study aimed to determine the most common microorganisms involved in diabetic foot infections and to identify possible risk factors related to the isolation of Gram-negative bacteria.

Method: In this retrospective study, all microorganisms cultured from 32 outdoor and admitted patients with diabetes mellitus of 'Venizelio' General Hospital of Heraklion, Greece. A total of 47 infected diabetic foot wounds were cultured using standard microbiological procedures. The samples were taken mainly by curettage and in cases where it was impossible by ulcer base swab. Data regarding sociodemographic characteristics, history of hospitalization and isolated microorganisms were recorded.

Results/Discussion: We identified 105 isolates, the most common pathogens of which were ***Enterococcus faecalis*** (12,4%), ***Staphylococcus aureus*** (9,5%) and ***Proteus mirabilis*** (7,6%). 45 isolates were Gram-negative in 32 cultures, corresponding to 68% of all cultures. 55% of the cultures were multimicrobial. 40% of patients suffered from osteomyelitis at some time, 15,5% were treated surgically for their infection whereas small amputation was performed in 3 patients (one with metastatic colon cancer in order to start as soon as possible chemotherapy). Mean age of patients was 63.8 (SD = 11.0) years. Compared to Gram-positive infections, cultures with Gram-negative organisms were taken from patients with a BMI > 30 kg/m^2 (p-value = 0.028). No significant association was found between isolated microorganisms and duration of diabetes, HbA1c, smoking or history of hospitalization.

Conclusion: In our study, Gram-negative organisms were isolated in more than 2/3 of the cases indicating that both Gram-positive and negative bacteria should be considered as common causes of diabetic foot infections. Treating physicians should always take cultures before starting empirical therapy, especially in obese patients, in order to accomplish higher cure rates and to lower the risk of antibiotic resistance.

[P12] EVALUATION OF THE EFFECTIVE AND SAFETY USING DAPTOMYCIN TO CHRONIC LOWER LIMBS ULCERS WITH MRSA INFECTIONS

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Aim: Methichillin-resistant Staphylococcus aureus (MRSA) related infections of the chronic lower limbs ulcers have been increasing in the world. Infections are the factor of delayed wound healing. MRSA infections are difficult to control and treat. In Japan glycopeptide antibiotic, aminoglycoside antibiotic and oxyazoline are insurance applied anti-MRSA antibiotic. They are increasing to show up as resistant and intermediate. A new anti-MRSA antibiotic as lipopeptide antibiotic (Daptomycyn: DAP) started using from September 2011. Therefore, in this study evaluating effective and safety using Dap to chronic lower limbs ulcers.

Method: Two studies are examined. First study is identification bacteria of wound cultivation. A total of 72 chronic lower limbs ulcers were identified between January 2012 and December 2012. Wound cultivation methods were swab cultivation and tissue cultivation. Results of these cultivations are analyzed what kind of bacteria, according detection of bacteria about pre, post swab cultivations and tissue cultivation. Second study is an effect of DAP to MRSA related infections of the chronic lower limbs ulcers. 125 chronic lower limbs ulcers patients with MRSA infections or suspected MRSA infections treated by DAP for at least three days between April 2012 and December 2014. The objects of patients are treated with DAP first time, if they are treated with DAP several times. Patients were treated by author in two hospital.

Results/Discussion: First study: Total number of microbacteria is 35 bacteria isolates from swab and tissue. MRSA, MSSA, Pseudomonas aeruginosa, Escherichia coli, Serratia marescens represented 22%, 14%, 12%, 9%, and 8% of the isolates. Concordance rate of all match, pre and post washing, not match is 46%, 33%, 8%. Second study: 76 patients MRSA related infection. The average age of patients is 65.8, and the men 51. The clinical effectiveness are WBCs, CRP and wound turning. Notable each efficiencies are WBCs 76.3%, CRP 55.3% and wound turning 77.6%. The results of other chemistry test data are 2 cases decrease PLT with count under 100,000 and 2 cases worsen stage CKD(eGFR). Expecting patients of acute limb ischemia (ALI), CK score over 1,000IU/L, and occurred cerebral vascular disorder and coronary artery disease under treatment, CK score is pre 64.3±58.8 and post 111.6±83.0 (P=0.004).

Conclusion: DAP is new anti-MRSA drug in Japan. MRSA is highly detection rate about chronic lower limbs ulcers. So DAP is effectively and safely about chronic lower limbs ulcers. Otherwise we require caution about outbreak of DAP-resistant bacteria in the future.

[P13] THE USE OF HOME PARENTERAL ANTIMICROBIAL THERAPY FOR DIABETIC FOOT INFECTIONS AND ITS ASSOCIATED COST SAVINGS AND REDUCTION IN INPATIENT STAY OVER A 1 YEAR PERIOD

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Aim: Diabetic foot infections (DFI) often require intravenous (IV) antibiotics resulting in a significant burden on inpatient hospital services. At our University Hospital, we have provisions to provide parenteral antimicrobial therapy at home via our Outpatient Parenteral Antimicrobial Therapy (OPAT) team. Trained nurses or patients themselves administer antibiotics at home and patients are followed up in clinic frequently. We reviewed our use of the OPAT service over 12 months to quantify the benefits.

Method: From the OPAT electronic records we identified 12 patients (8 male, mean age of 59 ± 9.4 years) who had IV antibiotics for DFI between January 2015 and January 2016. 8 patients had type 2 diabetes, 3 patients had type 1 diabetes and 1 patient had non-diabetic peripheral neuropathy. Mean HbA1C was 8.1% ± 1.7% (65mmol/mol ± 18.5mmol/mol). One patient had home antibiotics administered twice over that period via the OPAT service. Patients' paper and electronic records were retrospectively reviewed to assess method of admission; duration, nature and method of inpatient and outpatient antibiotic therapy; organisms identified with sensitivities; intravenous catheters used and resolution of infection.

Results/Discussion: 8 patients achieved resolution of their infection. The other 4 patients had either more severe infections or other factors affecting wound healing reflecting the multi-factorial nature of diabetic foot problems. The majority of patients were initially admitted to hospital, either from the foot clinic or as an emergency, and then discharged with OPAT. However 4 patients were started on OPAT directly from the clinic, bypassing any inpatient stay at initiation. Mean length of inpatient stay was 10.2 ± 8.8 days with a total of 132 bed-days. Assuming 1 bed-day costs approximately €410, this would cost the National Health Service (NHS) approximately €54120. This is likely to be an underestimation. OPAT antibiotics were given for a mean of 30.9 ±17.6 days, usually once daily via a midline (7 patients), PICC line (4 patients), Hickmann line (1 patient) or a peripheral cannula (1 patient). Two patients self-administered their antibiotics after proper training. In total, 402 days of OPAT antibiotics were administered.

Conclusion: Administering IV antibiotics at home is more cost effective than inpatient admission for IV antibiotics. With the increasing burden on hospital beds, administering antibiotics through the OPAT service can help reduce inpatient bed days resulting in a sizable cost saving to the NHS per patient. With the OPAT service some admissions can be avoided altogether which is beneficial for both patients and health care providers.

[P14] INFECTION AND GUT COLONIZATION BY KPC-PRODUCING KLEBSIELLA PNEUMONIAE AS RISK FACTORS FOR MORTALITY IN PATIENTS WITH DIABETIC FOOT INFECTIONS: A MULTICENTRE CASE-CONTROL STUDY

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To evaluate the role of KPC-Kp gut colonization and infection in influencing the mortality rate of diabetic patients with foot infection (DFI) we performed a retrospective, multicenter case-control study.
We analysed data from DFI patients cared for in 7 different centres. Patients were grouped as follow: Group A, patients with KPC-Kp isolated from infected foot specimen, Group B, patients with KPC-Kp isolated from rectal swab and Group C, control patients (negative for KPC-Kp cultures both from foot lesion and rectal swab).
From December 2010 to July 2015 62 DFI patients with KPC-Kp infections (42) (group A) or KPC-Kp gut colonization (20) (group B) were identified. The control group was represented by 49 pts (Group C). The three groups were similar regarding main demographic and clinical characteristics, except for the Charlson Index, significantly higher in Group A (13.5) and B (6.3) than in Group C (3.2) (p=0.002 Group A vs B and Group B vs C).

The mean duration of hospital stay was longer in Group A and B (respectively 40 and 44 days) vs Group C (7 days – p= 0.024 Group A vs B and p=0.018 Group B vs C). The levels of serum markers of Inflammation were significantly higher in Group A and B than in Group C, both Procalcitonin (Group A 1.86 ng/ml, Group B 1.12 ng/ml, Group C 0.72 ng/ml – p=0.025 Group B vs C, p=0.04 Group A vs C) and C Reactive Protein (Group A 13.5 mg/dl, Group B 6.3 mg/dl, Group C 3.2 mg/dl – p=0.002 Group A and group B vs C). Mortality was significantly higher in Group A (30.9%) and Group B (35 %) than in Group C (12.1% - p= 0.038 Group A vs C and p= 0.004 Group B vs C). The healing rate of DFI was 33% in Group A (p= 0.03 vs Group C) 30% in Group B (p= 0.002 vs Group C) and 57% in Group C.

In diabetic foot patients gut colonization and foot infection with KPC-Kp are associated with a reduction in healing rate and a significant increased in mortality

[P15] HIGH PREVALENCE OF QUINOLONE-RESISTANT MICROORGANISMS IN INFECTED DIABETIC FOOT

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Aim: Diabetic foot infections are often cause of hospitalization and amputation. Aim of this study was to define microorganisms of infected diabetic foot and prevalence of quinolone resistance

Method: Between January 2011 to December 2014, we analyzed the results of 105 cultures from patients with clinical signs of moderate or severe diabetic foot infections and not being treated with antibiotics. A total of 53 patients were registered, mean age 76.5 years, 81.1% male, 32% of patients had neuropathic foot, 13% ischaemic foot and 55% had neuroischaemic foot.

Results/Discussion: 89 (84.7%) cultures were positives, a total of 132 microorganisms were isolated, 71 Gram positive, 60 Gram negative and 1 fungus. Gram positive more frequently isolated were: St. aureus (44), E.faecalis (12), St.beta emoliticus (5), St.epidermidis (4), while Gram negative more frequently isolated were: Pseudomonas aeruginosa (15), Proteus mirabilis (10), E.coli (9), Morganella morganii (8), Serratia marcescens (7). In 69.5 % of cultures only one microorganisms was isolated.
The sites of the lesions were toe (46.6%), forefoot (34.2%) and heel (15.2%).
46.5% (61/131) of microorganisms were resistant to one antibiotic, while 16% (21/131) to two antibiotics, in particulary 11.1% of St.aureus were Methicillin-resistent and 32% (43/131) of microorganisms were quinolone resistant, of which 38% (27/71) of Gram positive and 26.6% (16/60) of Gram negative.

Conclusion: St.aureus and *P. aeruginosa* were the most frequently isolated pathogens. In this study microorganisms presented high percentage of resistance to quinolone, in particulary 70% of P.mirabilis (7/10) and 40.9% (18/44) of St.aureus. In our previous study of 2011, prevalence of P.Mirabilis quinolone resistant was 42.8%.
Ischaemia was an important risk factor for quinolone resistant, in fact 76.7% of pathogens were isolated from neuroischemic ulcers. Other risk factors were previous hospitalizzation (68.4%) and previous antibiotic therapy (81.5%).

[P16] MEDICAL IMAGING AND LABORATORY ANALYSIS OF DIAGNOSTIC ACCURACY IN 107 CONSECUTIVE HOSPITALIZED PATIENTS WITH DIABETIC FOOT OSTEOMYELITIS AND PARTIAL FOOT AMPUTATIONS

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Aim: The aim of this study was to compare the preoperative diagnostic accuracy of plain radiographic (X-ray) findings for diabetic foot osteomyelitis to the accuracy of magnetic resonance imaging (MRI) findings for osteomyelitis in the patients with confirmed histopathological specimens showing osteomyelitis. Secondly, it was desired to determine whether certain variables within the initial clinical presentation and preoperative laboratory findings were associated with more accurate diagnosis of diabetic foot osteomyelitis in this study population. Lastly, it was desired to determine the most common bacterial organisms found in bone and soft tissue cultures which were taken intraoperatively, and to determine how often the same organisms were found in both.

Method: Retrospective electronic chart review of 107 consecutive diabetic patients hospitalized at a single institution for first incidence of partial foot amputation based on initial clinical presentation from January 2012 through December 2014. Data collected from the charts included preoperative foot X-ray result, preoperative MRI result, preoperative laboratory results [white blood cell count (WBC), erythrocyte sedimentation rate (ESR), C-reactive protein (CRP)], bacterial organisms found on intraoperative soft tissue and bone cultures, and histopathology results of specimens obtained intraoperatively. Each subject was categorized according to anatomical location on preoperative clinical presentation. Statistical analysis included descriptive distribution, contingency analysis, bivariate scatter plots, simple and multiple logistic regressions, ANOVA or Welch's ***t***-test, and Tukey-Kramer's HSD as a post-hoc method.

Results/Discussion: Utilizing the logistic regression model based on the MRI results without considering the X-ray findings, it was found to be marginally significant (***p***-value = 0.0556; ***n*** = 80) with generalized R^2 = 0.1803. Only the effect of ESR was found to be statistically significant in this model (***p***-value = 0.0280) while the effect of the MRI findings was not statistically significant at all in diagnosing the foot osteomyelitis (***p***-value = 0.8886). In contrary, by utilizing the logistic regression model based on the X-ray findings without considering the MRI results it was found to be statistically significant (***p***-value = 0.0076; ***n*** = 79) with generalized R^2 = 0.2661, which was higher than that of the model based on the MRI findings. Among all the possible models examined, this was also the best fit (optimal) model considering all the variables in the study. Both the effects of ESR and of X-rays were found to be statistically significant in diagnosing the diabetic foot osteomyelitis (***p***-value = 0.0099 for ESR; ***p***-value = 0.0403 for X-rays). It was found that the higher ESR was, the higher the chance of the diabetic foot osteomyelitis was (unit odds ratio = 1.0326). Also, with positive radiographic findings, more likely the diabetic foot osteomyelitis was (odds ratio = 5.2291; ***p***-value = 0.0253). Although it was not found statistically significant, it was also observed that with abnormal CRP, the foot osteomyelitis was more likely (odds ratio = 3.8814; ***p***-value = 0.1475).

The six bacteria most frequently found in both soft tissue and bone cultures were ***Peptostreptococcus*** species, ***Staphylococcus aureus***, coagulase negative ***Staphylococci***, Group B ***Streptococci***, methicillin resistant ***Staphylococcus aureus***, and ***Enterococcus*** species. In addition, the relative frequencies of the bacterial organisms found in the specimens with positive histopathology (***viz***., diabetic foot osteomyelitis) and the specimens with negative histopathology were almost identical. This explains the fact that even though the site was infected based on intraoperative bacteriological analysis, the sample sent for a histopathologic analysis sometimes showed negative results. Thus, this indicates that diagnosis of true diabetic foot osteomyelitis cannot be made based on the bacteriologic analysis of the bone and/or soft tissue cultures alone.

Conclusion: It has been known that initial X-rays of the foot sometimes delay in showing evidence of osteomyelitis while MRI is more sensitive and specific even for early foot osteomyelitis. However, the results of this retrospective study in a diabetic population with partial foot amputations states otherwise. After adjusting for the effects of covariates (such as age, ESR, and CRP), X-rays seem to have significantly more significant power than MRI in predicting/diagnosing the diabetic foot osteomyelitis. More research and randomized prospective studies can provide further significant results in confirming the diagnostic accuracy of preoperative medical imaging and laboratory testing in patients with diabetic foot osteomyelitis and partial foot amputations.

[P17] DIABETIC FOOT INFECTION AS A CAUSE FOR FALL IN EGFR EVEN IN THOSE WITH NO CKD

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Aim: The aim of the study was to investigate the role of Diabetic foot infection (DFI) in declining eGFR among patients with and without CKD at baseline.

Method: A total of 440 patients with diabetes were recruited for a prospective study with a 12 month follow-up period (0, 3, 6 and 12 months). At the end of the follow up period a total of 194 subjects were included in the study. 246 patients were excluded due to loss of follow up and longer duration of wound healing or active ulcer. The study subjects were categorized into four groups. (Group I: diabetic subjects with CKD (stage 2 & 3) and DFI (n=52), Group II: diabetic subjects with CKD (n=50), Group III: diabetic subjects with DFI with no CKD (n=42) and Group IV- T2DM (n=50). Demographic, anthropometric and clinical parameters were recorded accordingly. Stratification of CKD was based on the eGFR stages as per KDOQI guidelines using CKD EPI formula and albuminuria. Classification of DFI was according to University of Texas Health Science Center San Antonio (UT) classification system (grade 2b and 3b).

Results/Discussion: The mean age of the study population was 58.6 ± 9.1 yrs with 10.2 ± 5.5 mean duration of diabetes. Significant fall in eGFR was observed within the group I at 6 months ([0 vs. 6]:64.703 ± 17.73 vs. 57.63 ± 15.55, p< 0.01) and 12 months ([0 vs. 12]: 64.703 ± 17.73 vs. 52.65 ± 14.82, p< 0.001). In group II fall in eGFR was noticed in 12 months ([0 vs.12]: 58.56 ± 15.06 vs. 47.5 ± 10.91, p< 0.001) and in group III significant fall in eGFR was observed in 3 months ([0 vs.3]:84.71 ± 12.73 vs. 78.36 ± 14.17 p< 0.05), 6 months ([0 vs. 6]: 84.71 ± 12.73 vs. 76.75 ± 13. 03, p< 0.01) and 12 months ([0 vs. 12]: 84.71 ± 12.73 vs. 74.1 ± 12.4, p< 0.001). No significant fall in eGFR was observed in group IV. The mean differences of eGFR in 12 months were 12.05 ± 2.91, 11.06 ± 4.16, 10.61± 0.33 and 3.34± 3.57 (ml/min/1.73m2) in all the groups respectively compared to baseline line

Conclusion: There was a significant reduction in eGFR among DFI patients with no evidence of CKD and also among DFI patients with CKD at baseline. Therefore development of DFI may cause decline in eGFR irrespective of CKD status.

[P19] CHARCOT FOOT ATTACKS IN A NON-TRANSPLANTED DIABETES MELLITUS POPULATION: THE IMPORTANCE OF CORTICOSTEROIDS AS A CAUSATIVE FACTOR

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Aim: Diabetes mellitus is nowadays the leading cause of Charcot neuroarthropathy. Polyneuropathy seems to be a prerequisite. The onset is frequently preceded by a trauma, though this cannot always be recalled by the patient. In a study on diabetes type 1 patients undergoing a simultaneous pancreas-kidney transplantation, a significant higher rate of Charcot neuroarthropathy attacks post-transplantation was observed that was positively correlated to the cumulative dose of used corticosteroids. The aim of this study was to retrospectively investigate the correlation between the use of corticosteroids and the development of a Charcot neuroarthropathy in a non-transplanted diabetes population

Method: Patients were included when treated or counselled in our interdisciplinary diabetic foot clinic from January 1, 2004, until December 31, 2015. Based on the Belgian IKED registration diabetes patients with a Charcot foot were individualized. The diagnosis of Charcot neuroarthropathy was checked based on the patients' medical records. Subsequently, all patients that underwent a transplantation in the past were excluded. For all remaining patients their medical records were checked for the use of corticosteroids prior to the development of the Charcot foot.

Results/Discussion: According to the IKED registration, a total of 100 diabetes patients with a Charcot foot was retrieved. Of these 100 patients, seven patients were excluded because they were transplanted in the past and eight other patients were excluded because they were misdiagnosed as a Charcot foot. Another nine patients were excluded because insufficient information about the use of corticosteroids was found in the medical records. A total of 76 patients with a Charcot foot and with sufficient information about corticosteroid use was analyzed. Out of these 76 patient, 39 patients (51%) had a confirmed diagnosis of a Charcot neuroarthropathy and the date of onset was known. In 26 patients (34%) the exact onset of the Charcot neuroarthropathy attack could not be determined, or a strong suspicion for a Charcot neuroarthropathy was present but without radiological evidence. In eleven patients (14.5%) the available information was based on only one visit in our clinic rendering it sometimes difficult to confirm the diagnosis. Out of these 76 patients with a Charcot foot, eight (10.5%) had a history of corticosteroids use prior to the development of their Charcot foot. Unfortunately, no cumulative corticoid dose could be calculated.

Conclusion: Since 68 out of 76 diabetes patients (89.5%) developed a Charcot neuroarthropathy without the evidence of the use of corticosteroids in the past, the use of any corticosteroids seems not to be a prerequisite for the development of a Charcot foot. However, a major limitation of this retrospective study was the difficulty to retrieve sufficient and correct information using the IKED registration forms and the medical records.

[P20] THE ROLE OF THE CT GUIDED BONE BIOPSY IN PATIENTS WITH DIABETIC FOOT SYNDROME TO DIFFERENTIATE OSTEOMYELITIS FROM CHARCOT- NEUROOSTEOARTHROPATHY

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Aim: The diabetic foot syndrome represents one of the most common complications in patients with diabetes mellitus. The Charcot neuro-osteoarthropathy (CN) is a severe complication that increased in incidence in the last years (i.e. in Germany 7% of patients with diabetic foot syndrome suffer from CN). In acute situations it is very important to discriminate CN against Osteomyelitis because both diseases require different treatments.
Despite modern diagnostic tools (Scintigraphy with leukocysts / MRI / FDG-PET / SPECT-CT) a definite diagnosis is not always possible.

In these cases a bone biopsy can help decisively.

Method: In eight patients a MRI scan (Magnetom Symphony, 1,5 T, Fa. Siemens) determined the extent and activity of the bone lesions.
The identified lesions were computertomography (64 Slice CT, Fa. Siemens)-guided biopsied under sterile conditions with a 16 G bone biopsy needle.
If necessary a local anaesthesia was injected.
The specimens were evaluated cytologically and microbiologically.

Results/Discussion: In 90 % of cases (n= 7) a definitive diagnosis could be achieved.

Conclusion: In patients with diabetic foot syndrome a bone biopsy could clearly distinguish between CN and Osteomyelitis in 90% of the cases.

In our hands a bone biopsy is a safe and helpful diagnostic tool.

[P21] WHAT MRI-INTERVALS FOR MONITORING THE RESOLUTION OF ACTIVE DIABETIC CHARCOT FOOT ? A RETROSPECTIVE CLINICAL STUDY

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Aim: MRI should be applied for establishing the diagnosis of active Charcot foot as soon as possible when an insensate foot in diabetes gets swollen (Petrova et al, 2015). Furthermore, MRI can be used for monitoring the response of the condition, in particular of bone marrow edema (BME), to offloading and immobilisation treatment. The speed of evolution/resolution of BME, which is largely unknown, was reviewed from MRI follow-up studies obtained in clinical routine.

Method: A total of 33 MRI follow-ups of various durations were retrieved from patients' charts of a single institution, comprising 15 cases of active Charcot foot grade 0 and 1 (Chantelau and Grutzner, 2014) in 13 patients. The initial MRI had been performed 3 (<0.25-5) months [median (range)] after the inciting trauma, which was identifiable in 14 cases.

Results/Discussion: The 1st follow-up studies after 2.25 (1.5-3.75) months showed – according to radiologists' semiquantitative comparisons- partial resolution of BME in all but 3 cases (whose BME had not fully developed <1 week after the trauma on the initial MRI and decreased only later). There were 5 more follow-up studies without BME reduction in which, however, insufficient offloading and immobilisation was deemed causative. In 6 cases, BME had disappeared after 9 (3-17.5) months of treatment, on the 2nd to 4th follow-up MRI. BME changes varied according to succession and interval of follow-up (Table):

Length of MRI follow-up intervals, months	1.5-2	>2-4	>4
MRI follow-up studies, n	8	16	9
Distribution of 1st/2nd/3rd/4th MRI follow-ups, n	6/2/0/0	9/6/1/0	0/4/4/1
MRI follow-up studies with BME reduction, n (%)	4 (50)	13 (81)	8 (89)

Conclusion: Short-term (< 2 months) MRI follow-ups seem useful early after onset of treatment of active Charcot foot, to track completion of the initial BME lesion, and/or to underpin patient compliance. For monitoring BME resolution in compliant patients, 3 months interval is sufficient. The data corroborate reports that BME evolution parallels the bone healing processes, which take several months of treatment to complete (Krüger et al. RÖFO 1999, Edmonds et al. Diabetologia 2006, Zampa et al. Skeletal Radiol 2011, Ruotolo et al. 2013). Further MRI study is required for assessing the chronology of BME changes more precisely.

[P22] BIOMECHANICS OF THE CONTRALATERAL FOOT IN DIABETIC PATIENTS WITH UNILATERAL MINOR AMPUTATIONS

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Aim: To study the biomechanical behavior of the contralateral foot in presence of unilateral minor amputations.

Method: 98 patients with unilateral minor amputations (Gr.1) and 126 patients with severe peripheral neuropathy without history of amputations and Charcot foot (Gr.2) were examined. Pressure distribution measurements were performed with emed-a50 system. Peak pressure (PP), maximum force (MF), force-time integral (FTI), and contact time (CT) normalized to roll-over process (ROP) were calculated beneath the hindfoot (Hf), midfoot (Mf), metatarsal heads (MTH1-MTH5), big toe (T1), second (T2), and lateral toes (T345). MF and FTI were normalized to the body weight (BW). ANOVA was used for the intergroup comparison ($p<0,05$).

Results/Discussion: Significant differences in Gr.1 vs. Gr.2 are the increased loading of Mf (PP: 142±114 vs. 126±113 kPa, $p<0,01$), MTH1 (PP: 366±262 vs. 338±244 kPa, $p<0,01$; MF: 21,2±9,1 vs. 20,1±8,7 %BW, $p<0,05$; FTI: 10,8±5,5 vs. 10,0±5,5 %BW, $p<0,01$), MTH4 (PP: 262±148 vs. 236±119%, kPa, $p<0,001$ and MF: 14,2±4,7 vs. 13,6±4,5 %BW, $p<0,05$), and MTH5 (PP: 314±246 vs. 246±216 kPa, $p<0,001$; MF: 8,9±4,7 vs. 7,8±4,4 %BW, $p<0,001$; FTI: 4,3±2,7 vs. 3,7±2,4 %BW, $p<0,001$) and decreased loading of T1 (PP: 304±177 vs. 341±214 kPa, $p<0,001$; MF: 11,9±6,2 vs. 12,8±6,8 %BW, $p<0,01$; FTI: 5,3±3,5 vs. 5,9±3,7 %BW, $p<0,05$) and T345 (MF: 2,8±1,9 vs. 3,7±2,9 %BW, $p<0,001$; FTI: 1,4±1,2 vs. 1,8±1,6 %BW, $p<0,001$). Besides, significantly increased CT was found beneath MTH5 (79,5±7,1 vs. 78,1±7,9 %ROP, $p<0,001$). No significant changes of the parameters were found beneath Hf, MTH2, MTH3, and T2. The loading distribution pattern was the same in both groups. However, progression of motor neuropathy, clawing of the toes, and increase of the plantar deviation of the metatarsal heads caused the overloading of the lateral metatarsal heads and decrease of push-off in the contralateral feet. The increased loading of the midfoot could be due to the gradual development of non-Charcot associated collapse of the medial and central arches caused with progression of motor neuropathy.

Conclusion: Minor amputations influence on the biomechanical functions of the contralateral foot increasing the risk of ulceration and further amputations on the contralateral foot of the medial and lateral metatarsal heads. Similar loading patterns of the feet without amputations in patients with severe neuropathy and of the contralateral feet in operated patients suggest the contribution of "biomechanical continuum" in high risk of amputations.

[P23] EVALUATION OF D-FOOT, A TOOL TO IDENTIFY THE RISK FACTOR FOOTDEFORMITY IN DIABETES

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Aim: There are several foot quantitative assessments that are commonly used to identify the risk factor "foot deformity" in diabetes. The aim of the study was to evaluate the reliability of some of the continuous variables.

Method: An eHealth tool, D-Foot, for objective risk classification for patients with the risk of developing diabetic foot ulcers were used. Out of a total of 22 assessments in the software, four continuous variables that specifically capture foot deformities were extracted. These four variables were: passive range of flexion at metatarsal phalangeal joint 1; maximum toe height, maximum flexion in the ankle joint and navicular drop test. Measurements were carried out with a goniometer and with a ruler respectively.

The D-Foot software was constructed for daily use by Prosthetist Orthotists (PO) and podorthotists at the Departments of Prosthetics and Orthotics (DPO). The purpose with the D-Foot was to facilitate an objective risk stratification and foot assessment in diabetes. Inter-reliable tests took place 2014-2015. A total of 97 patients with diabetes (type 1 n=33, type 2 n=64) referred to the DPO were included. Mean age was 64 ± 13, duration 17 ± 14 years and BMI 28 ± 5. All four DPO's in the Region Västra Götaland participated: Göteborg (n_G=38), Trollhättan (n_T=22), Borås (n_B=14 and Skövde (n_S=23).
Every patient was evaluated by two clinicians. After that the first PO had completed the assessment the second PO examined the feet using D-foot on a tablet. The clinicians where experienced PO or Pedorthotists.
In the analyse of inter-agreement a variant of Pearson's correlation coefficient (r) and intra class correlation coefficient (ICC) were used, named the weighted sum. This summery statistic takes into consideration the fact that the four DPO included a different number of patients. Agreement for each DPO's were also calculated.

Results: Inter-agreement (weighted sum) was: for passive range of flexion at metatarsal phalangeal joint 1 (r=0.65; ICC=0.62); maximum toe height (r=0.52; ICC=0.44), maximum flexion in the ankle joint (r=0.72; ICC=0.66) and navicular drop test (r=0.40; ICC=0.32). An example of the variation of the inter-agreement (r and ICC) is given for passive range of flexion at metatarsal phalangeal joint 1: Gothenburg r=0.75, ICC= 0.75; Trollhättan r=0.56, ICC=0.55, Borås r=0.33, ICC= 0.17 and Skövde r=0.75, ICC= 0.75.

Discussion: Weak agreement in some variables were noticed and regional discrepancy was found. Single DPO reported lower values, in general, for hallux joint motion as compared with other DPO. However, a new technique was introduced for these two measurements and can possible explain a low agreement.

The DPO's in Göteborg and Skövde in general showed higher agreement regarding the ICC on the variables involving a goniometer as compared with the DPO´s in Borås and Trollhättan. The DPO in Borås had however better results of variables obtained with an ordinary ruler.

It makes no sense to believe that patients with diabetes in the southern part of the studied region in general have less mobility in their toes. This study highlights the need to facilitate foot assessment for PO´s.

Conclusion: It is more difficult than expected to evaluate the feet in diabetes and to assess whether a foot present with the risk factor foot deformity or not. There is a need for further research to find robust method to use in the foot assessments in diabetes. In the second revision of the eHealth tool D-Foot assessments with low agreement are considered a) to be explained with an easy-to understand manual or b) to be removed.

[P24] DEFORMATION AT FIRST PRESENTATION IS ASSOCIATED WITH ULCERATION IN ACTIVE CHARCOT FOOT: A PROSPECTIVE FOLLOW-UP STUDY OF 62 PATIENTS OF THE IQED-FOOT STUDY

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Aim: Charcot foot is a rare but devastating complication of diabetes. We aimed to get a clear picture of the actual circumstances in which Charcot foot occurs and how it is managed. Emphasis was placed on epidemiological data (age at occurrence, diabetes duration, history of smoking,...) and data about management (time to diagnosis, deformation present at diagnosis, method of immobilization).

Method: Thirty-four multidisciplinary diabetic foot clinics in Belgium sampled the first 52 patients presenting with diabetic foot problems, resulting in a total of 1782 cases in 2014. 62 cases were prospectively registered as acute Charcot foot, defined as a red, swollen and warm foot, and followed up to a maximum of six months in terms of treatment and outcome. Data were collected, for the purpose of quality-of-care monitoring in the IQED-Foot study. The data were stratified in 2 different ways, after which analysis was performed. In a first comparison, a subgroup 'acute Charcot foot with wound at presentation (N=27)' and a subgroup 'acute Charcot foot without wound at presentation (N=35)' were analyzed. In a second comparison, a subgroup 'acute Charcot foot with deformation at presentation (N= 40)' and a subgroup 'acute Charcot foot without deformation at presentation (N=22)' were analyzed.

Results/Discussion: The prevalence of already existing deformation of an acute Charcot foot at first visit was significantly higher in case a wound was also present (85.2% vs. 48.6%, $P<0.05$). The occurrence of new wounds located at the fulcrum of the deformity causing a pressure point during follow-up was significantly higher in the group of patients with wounds at the first visit (55.6% vs. 11.4%, $P<0.05$). This was also the case for the occurrence of new wounds outside the pressure point (25.9% vs. 0%, $P<0.05$). Considering treatment, the use of immobilization of the foot was significantly higher in the group of patients without wounds at the first visit (100% vs. 85.2%, $P<0.05$). Stratifying cases with or without deformation at first visit, the only significant difference between the two groups, was the higher prevalence of wounds at the first visit in the group with deformation (57.5% vs. 18.2%, $P<0.05$).

Conclusion: The incidence of acute Charcot foot in a population of patients with diabetic foot problems was 3.5% (62 out of 1782 cases), which is similar to the incidence (0.1% to 8%) reported in the literature. The presence of wounds and deformation proved to be significantly and positively associated at time of the first visit.

Furthermore, new wounds preferentially occurred at the fulcrum of the deformity of the acute Charcot foot by causing a pressure point. A limitation of this study is the low number of cases which is probably responsible for the lack of other significant differences between the groups.

[P25] DIABETES, ANKLE PLANTAR FLEXION AND FOOT ULCERS

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Lower extremity ulcers represent one of the most ominous, dreaded, and costly complication of diabetes mellitus. Many factors contribute to the development of diabetic foot. Limited joint mobility, in particular in patients with peripheral neuropathy, is a major risk factor for ulcers. The aim of this study was to test the feasibility and usefulness to evaluate ankle joint mobility (AJM) in both plantar and dorsiflexion for monitoring the ulcerative risk.

AJM in plantar (PF) and dorsiflexion (DF) was evaluated in 99 patients with diabetes, type1/type2: 50/49, (58/41;M/F), and 59 healthy controls (32:27/M:F). Patients and controls were divided into 6 groups by age and neuropathy: 32 young patients without neuropathy (group YD), mean age 12.4±2.0 yr, 29 young controls (group YC), mean age 11.4 ± 3.3 yr, 38 elderly patients without neuropathy (group ED), mean age 58.5 ±10.3 yr, 15 neuropathic patients without history of foot ulcer (group ND), mean age 62.1 ± 7.9 yr, 14 neuropathic patients with history of foot ulcer (group NUD), mean age 64 ± 8.4 yrs, and 30 elderly healthy controls (group EC), mean age 60.3 ± 6.4 yr. Diabetes duration was respectively: group YD 5.5 ± 3.5 yr, ED 16.5 ± 10.6 yr; ND 18.2 ± 13.1 yr and NUD 13.7 ± 9.6 yr. AJM was evaluated by an inclinometer with the patient lying supine, the subtalar joint in neutral position and the ankle in the position freely taken at the beginning. The knee, corresponding to the ankle evaluated, was extended and put over a rigid 5-cm high support.

The AJM in plantar and dorsal flexion of different groups was: group YC 147.2°±19.17°, group EC 130,4°±15.1°, group YD 118,5°±19.7°, group ED 107.9°±24,9°, group ND 108,0°±28,8°, group NUD 78.1°±18.4°. Evaluated on the whole elderly patients (ED, ND, NUD) showed a significantly lower AJM in plantar and dorsal flexion than controls (EC group) ($p < 0.001$). Patients with neuropathy and history of foot ulcer (NUD group) showed a more significant AJM reduction in DF and PF than all other groups ($p < 0.005$). The total range of motion of ankle in NUD group was reduced of 40.1% compared to the EC group and of 46.9% compared to the YC group (78.1°± 18.4 vs 147.2°± 19.1, 130.4°± 15.1). Only DF was significantly reduced in the NUD group compared to the ED group ($p < 0.001$). The YD had lower AJM in both movements compared to the young controls (YC) ($p < 0.001$) with PF lower than DF (30.9% vs 15.5%). Among patients and controls the elderly groups had a significant reduction of the only DF (EC vs YC, $p < 0.001$; ED vs YD, $p < 0.05$).
These results confirm that an AJM reduction of about 40% (28-32°) in patients with diabetic neuropathy can be considered as a threshold for ulcer risk. The method used allows a direct evaluation of AJM in plantar flexion that seems to show an early reduction in diabetic subjects, thereby providing useful information for patient monitoring.

[P26] ROLE OF CALCANEAL QUANTITATIVE ULTRASONOMETRY FOR DIAGNOSIS OF CHARCOT FOOT IN PATIENTS AFTER PANCREAS TRANSPLANTATION

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Aim: Previous studies showed high incidence of Charcot foot (CF) after simultaneous pancreas and kidney transplantation (PTX). The reason may be the persisting bone renal disease affecting also bones of the feet. Measurement of bone mineral density (BMD) especially in the calcaneal area may be helpful in diagnosing of CF in this high risk population. The aim of our study was to compare calcaneal quantitative ultrasonometry (QUS) parameters in patients after PTX with/without CF with patients with severe diabetic neuropathy (DN) and with CF patients.

Method: 72 diabetic patients were enrolled in the present study – 12 patients after PTX with inactive CF (PTX CF group); 20 after PTX without CF (PTX group); 20 patients with severe DN, but without CF (DN group) and 20 patients with inactive CF (CF group). BMD in calcaneal area was measured in both feet by QUS in the CF groups; in patients without CF (PTX and DN groups), the foot with the worse T score was used for later analysis. Osteoporosis measured by calcaneal QUS was defined as T-score ≤−1.8. BMD in the lumbar spine and proximal femur was assessed by dual energy X-ray absorptiometry (DEXA) by standard criteria.

Results/Discussion: There was a significant lower calcaneal BMD in affected foot in both PTXCF group (T score -3.3±1.9) and CF group (-3.8±1.9) in comparison with DN group (vs.-1.1±1.3; both $p<0.01$) and also with PTX group (-2±1.3; both $p<0.05$). Calcaneal BMD in non-affected foot in PTXCF (T score -2±1.1) was comparable with PTX group and both were significantly lower than in DN group (both $p<0.05$). The frequency of calcaneal osteoporosis of affected foot in PTXCF group was comparable with affected foot in the CF group (83% vs. 95%), but patients in the DN group had osteoporosis less often than both previous groups (50%; both $p<0.05$). BMD in the lumbar spine and proximal femur in both PTXCF and PTX group were significantly lower in comparison with both DN and CF group (all $p<0.05$).

Conclusion: Lower bone mineral density persists in all assessed localizations including calcaneal area in patients after pancreas transplantation, which may result in higher risk for Charcot foot after pancreas transplantation. Calcaneal quantitative ultrasonometry may be useful method for diagnosis of Charcot foot in patient after pancreas transplantation.

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[P27] STRUCTURAL CHANGES AND BIOMECHANICAL DISORDERS IN PATIENTS WITH DIABETES MELLITUS AND HIGH-RISK FOOT

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Introduction: The objectives of this study were to examine the factors associated with structural changes measures in x-ray planes and second to identify which is the radiological angle more disrupted in patients with Diabetes mellitus.

Methods: A cross-sectorial study between January and December 2015, was performed in a Diabetic Foot Unit. We evaluated 73 consecutive adult patients (N=123 feet) with Diabetes mellitus (DM). Patients were excluded with the following criteria: individuals with diabetic neuropathic osteoarthropathy; with history of ankle or first ray surgery or amputation; and those with history of rheumatoid arthritis. Neuropathy was diagnosed by using the Semmes-Weinstein 5.07/10 g monofilament and a biothesiometer. Passive dorsiflexion was assessed in the foot at the ankle and at the first metatarso-phalangeal joint (MFJ). A lateral radiographic view was obtained and the angles associated with the ankle and first MFJ were measured: tibiotalar angle, tibiocalcaneal angle, talo-calcaneal angle, talus inclination angle, calcaneal pitch angle, and first metatarsal inclination angle. Foot position was evaluated by using the foot posture index (FPI). Linear regression in SPSS version 20.0 (SPSS, Chicago, IL, USA) was used to evaluate the variables associated with each angles. p<0.05 was considered to be statistically significant for a confidence interval of 95%.

Results: Neuropathy was identified in 68 (55.3%) feet and 57 (46.3%) feet had history of forefoot ulcer. Variables associated with the measured angles are shown in the table.

n=123 feet	Tibiotalar angle	Tibiocalcaneal angle	Talus inclination angle	Calcaneal pitch angle	First metatarsal inclination angle.
Age	p=0.012 * [0.062-0.490]	p=0.024 * [0.022-0.300]	p<0.001 * [0.099-0.263]	p=0.002 * [-0.281—0.067]	p<0.001 * [-0.200—0.079]
Body Mass Index	p=0.609 [0.049-0.998]	p=0.001 * [0.153-0.600]	p=0.081 [0.169-0.954]	p=0.001 * [-0.458—0.116]	p=0.034 * [-0.202—0.008]
Foot Posture Index	p=0.387 [-0.083-0.971]	p=0.139 [0.143-0.953]	p=0.017 * [0.234-2.328]	p=0.002 * [-3.524—0.803]	p<0.001 * [-2.286—0.669]
Ankle joint mobility	p=0.307 [0.098-0.978]	p=0.678 [0.040-0.961]	p=0. 041 * [0.005-0.265]	p=0.887 [-0.014-0.921]	p=0.303 [-0.100-0.941]
Neuropathy	p=0.228 [0.116-0.940]	p=0.323 [0.096-0.926]	p=0.711 [-0.036-0.889]	p=0.293 [-0.102-0.881]	p=0.646 [0.045-0.840]
First MFJ mobility	p=0.987 [-0.002-0.999]	p=0.270 [-0.107-0.974]	p=0.070 [-0.175-0.884]	p=0.076 [0.172-0.876]	p<0.001 * [0.046-0.123]

Conclusions: Neuropathy was not found as a factor associated with structural changes in the foot. Changes in inclination of talus and first metatarsal angles were associated with foot position and limited joint mobility. These radiological changes could help to understand rocker bottom foot. Pronated feet associated with limited first MFJ showed similar changes to the rocker bottom foot.

[P28] DIAGNOSIS OF CHARCOT FOOT - A MARKER OF OVERALL DECLINE IN HEALTH AND WELL-BEING: THE PATIENT'S PERSPECTIVE

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Aim: The impact of a clinical diagnosis of Charcot foot with/ without deformity and its long-term treatment with a total contact cast on patient's quality of life has not been studied. The aim of this research was to enhance the understanding of the lived experience of the active Charcot foot with a view to investigate patient's acceptance and "life with a Charcot foot".

Method: We carried out a prospective study in diabetic foot patients recently diagnosed with acute Charcot foot presenting to one clinical centre and undergoing treatment with casting therapy. We applied a novel method of auto-photo elicitation and qualitative interviews, which were evaluated with interpretive phenomenological analysis. Participants were asked to bring in 3 to 5 of their own photographs to demonstrate how the diagnosis and management of active Charcot foot had affected their lives. These photographs were used as the basis of a discussion in a semi-structured, tape recorded interview.

Results/Discussion: We studied 8 patients with an acute active Charcot foot (6 males and 2 females; 2 with type 1 and 6 with type 2 diabetes). The mean age was 59 ±9.8 years (mean ±SD) and the mean duration of diabetes was 16±12.5 years. All patients were treated with total contact casting. One patient had bilateral involvement and was treated with two casts. Time from symptom onset to diagnosis ranged from 3 days to 6 months (10±9.5 weeks). Three patients had already developed Charcot foot deformity at the time of presentation to the Foot Clinic. Duration of casting therapy prior the interviews ranged from 3 to 7 months (3±1.8 months).

Patients identified several areas of concern including issues surrounding non recognition of symptoms and misdiagnosis of Charcot foot, lack of available information, the challenges of acceptance of the diagnosis, effects on diabetes, depression and suicidal thoughts, isolation, loss of meaningful activity and employment, changing sense of self, effects on relationships, and fear of the future. All patients saw being diagnosed with a Charcot foot as a marker of overall decline in health and well-being.

Conclusion: This is the first study that has explored the patient's perspective of the lived experience of active Charcot foot and its treatment with a total contact cast. It has demonstrated that both the diagnosis of a Charcot foot and its long-term management with total contact casting, have an immediate and severe impact on patient's perceived quality of life and sense of well-being. More patient focus research is required in order to improve patient care.

[P29] DO DIABETES MULTIDISCIPLINARY FOOT CLINICS HAVE AN IMPACT IN REDUCING MAJOR AMPUTATION RATES-THE COUNTY DURHAM AND DARLINGTON EXPERIENCE?

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Aim: To look at the major amputation rates over a 1 year period (2013-2014) in a district general hospital and compare with the previous years. To assess the impact of introducing multidisciplinary foot clinics and a 24 hour referral pathway on the major amputation rates in our diabetes patients.
We also looked at the referral time in days between the patient reported symptoms and first contact with Multidisciplinary foot team (MDFT). We wanted to determine if these amputations were preventable.

Method: This was a retrospective audit over a one year period. Major amputation data was analysed using clinical coding. Data was analysed using systmOne and electronic clinical documentation. Regional audit tool was used comprising 58 key parameters.

Results/Discussion: 31 major amputations were identified during the audit period when compared to previous years when the major amputations were around 51. Majority of these were men (n=28) with the mean age being 68. The significant reduction of major amputations was due to introduction of the multidisciplinary foot team, 24 hours referral pathway and education raising awareness amongst patients and various health care professionals. Around 50% of the referrals were seen within 24 hours. Suboptimal diabetes control was noted in these patients. Ideally we would like to see all these patients within 24 hours. However lack of awareness among patients and healthcare professions about the need for immediate referral in active disease foot patients continues to be the main hurdle in the delay in reporting and referrals.

Conclusion: Introduction of the multidisciplinary diabetes foot team and an effective care pathway had a major impact in reducing major amputations in these patients. Majority of diabetes foot amputations can be prevented if these patients are seen and assessed within 24 hours by a multidisciplinary foot team. Raising awareness among patients and healthcare professionals in primary care about the importance of good diabetes control and the need to be referred within 24 hours is the only way in reducing the major amputation rates in these patients. Education about the importance of early recognition and rapid referrals to the MDFT is the only way of preventing major amputation in these patients.

[P30] PERIPHERAL ARTERIAL DISEASE AND AMPUTATIONS IN DIABETIC PATIENTS WITH CHARCOT FOOT: ITALIAN DATA 2003-2013

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Background: Charcot neuroarthropathy is a serious complication of diabetes mellitus that can lead to foot ulceration, hospitalization and amputation.

The purpose of this study is to provide national data on the prevalence of hospitalization for Charcot foot in the DP and the incidence of major and minor amputations and revascularizations in our country.

Methods: In the period 2003-2013, on the national hospitalization database have been identified all hospitalizations with Charcot disease associated with diabetes (codes ICD-9-CM 713.0, 713.5, 713.8 with 250. for diabetes diagnosis indicated during the same hospitalization or in any of the patients in the same year). In the same period were also evaluated by ICD9 code in any position, the amputations (841) and intraluminal (39.5,39.90) and surgical ((39.25, 39.29) revascularizations.

Results: The admission rate for Charcot was constant from 2003 to 2013 with values ranging between 0.16 / 1000 and 0.13 / 1000 diabetic patients (p = NS after Poisson regression). The highest prevalence was found in the age group 45-54 and in males who showed a relative risk of 1.81. The days of hospitalization (10.4 ± 10.3gg in 2003; 12.2 ± 13.6gg in 2013) were unchanged over time. Out of 317 patients admitted in 2008, within 5 years 117 (36.9%) had a hospitalization for amputation or revascularization: there were 90 amputations (28.4%), including 61 minors, 26 major and 3 unspecified, there were also 57 revascularizations of which 52 endoluminal and 5 surgical.

Conclusions: Although not very often coded, the prevalence of Charcot foot remains constant in hospital admissions in our country. The Charcot foot is associated with increased risk of major or minor amputations and, although it has been usually associated with neuropathy only, peripheral arterial disease is not uncommon as well as the need of revascularization.

[P31] TOTAL CONTACT CASTING IS EFFECTIVE TREATMENT MODALITY IN FOOT ULCERS IN NON-PLANTAR AREAS

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Aim: Total contact casting (TCC) is an established treatment modality for offloading plantar foot ulcers in high pressure areas. The aim of this study was to assess the effectiveness of TCC in the management of foot ulcers in non-plantar areas.

Methods: We studied 15 patients who presented to our Diabetic Foot Clinic with post-surgical wounds (9) and non-plantar foot ulcerations (6). Ulcer sites included: dorsal medial arch (6); posterior calcaneal heel (2); medial site of 1st metatarsal head (2); post-digital amputations (2), transmetatarsal amputation (1); anterior ankle (1) and interdigital (1). All patients were treated with standard wound care and casting therapy: non-removable TCCs – 10 patients (6 TCC were with a window); bespoke removable TCCs (4), and aircast (1). At each visit, ulcer healing was monitored with a 3D digital wound assessment technology.

Results: There were 12 men and 3 women with a mean age of 61 ±11.9 years. There were 3 patients with type 1 diabetes (1 had kidney and pancreas transplant) and 12 patients had type 2 diabetes. Their mean HbA1C was 8.1±2.9%.The average ulcer size prior casting was 22±16 cm^2. All wounds healed using casting treatment and the mean ulcer healing time was 22±12.3 weeks.

Conclusion: Below knee TCC is a successful method of treatment for diabetic foot wounds which are not always associated with elevated plantar pressure. This study has shown that TCC is an effective treatment modality in postsurgical wounds and extensive foot ulceration in non-plantar areas. The benefits of TCC in controlling friction, reducing leg oedema and providing foot and ankle stability are key factors for optimising foot ulcer healing in diabetic foot patients.

[P32] MULTIDISCIPLINARY TREATMENT OF DIABETIC FOOT ULCERS; A PROSPECTIVE STUDY

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Aim: In the western world, the diabetic foot becomes an ever increasing problem. At the moment international guidelines such as the International Working Group on the Diabetic Foot (IWGDF) plea that a multifactorial approach is the way to go, given the fact that the diabetic foot is a combination of different causes such as polyneuropathy and peripheral arterial occlusive disease (PAOD). Since 2013, our Hospital implemented this multifactorial approach according to the latest standards. Therefore, our aim was to investigate the outcome of our renewed multidisciplinary treatment on the amputation rate and healing over the last years.

Method: A prospective study was conducted in 210 patients, involving new diabetic Diabetic foot ulcers in 2014 and 2015. These patients were treated conform the latest Multidisciplinary standards. As a reference we retrospectively used the records of 46 patients with new diabetic foot ulcers in 2012. Included in the approach for 2014 en 2015 was evaluation of a new referred patient within 1 week. Combined evaluation of new patients was conducted by vascular surgery, internist, rehabilitation specialist, wound nurse, podiatrist and cast master. Depending on the diagnoses of the diabetic foot ulcer, a treatment plan was created and followed by one of the doctors of this team. As a standard, renewed multidisciplinary evaluation of the patient was performed after 4-6 weeks and treatment plan adjusted when needed. Acute diabetic foot patients were reviewed by the vascular surgeon as soon as needed. In 2012, patients with diabetic foot ulcers were evaluated by vascular Surgery, Internist/podiatrist or rehabilitation specialist alone. After this first consultation, multidisciplinary approach was only organized when needed. From these cohorts, data concerning AGE, gender, Type of Diabetes, Smoking history, hypertension, time to cure the ulcer, Texas classification, Amputations (minor and major amputations combined), duration of admission and vascular interventions were recorded. Data was collected and analyzed in SPSS 22.

Results/Discussion: At baseline no significant differences in Type of Diabetes, Gender, Age, Smoking history and hypertension were observed between the 2012 and 2014/2015 cohorts. There was an increase in new patients over the observed years (46 (2012), 95 (2014) and 115 (2015)). No differences between the cohorts were observed in Vascular interventions, time to cure and admission days in hospital. The recorded Texas classification was distributed equally among the groups. There was a significant correlation with the Classification and amputation rate (minor and major). Amputation rate was increasing with severity of Texas classification ($p<0.05$). There was a significant difference observed between the amputation rate in 2012 and 2014/2015. In 2012; 37% (17/46) amputations were observed versus 20% (19/95) in 2014 and 15% (17/115) in 2015 ($p<0.05$).

Conclusion: A renewed multidisciplinary approach for diabetic foot ulcers seems to be effective in our clinic to reduce the rate of minor and major amputations. However, healing time, admission time and percentage of vascular interventions did not differ. In contrast it is difficult to judge quality of care based on amputation rate. Especially minor amputations are sometimes needed to control the disease.

[P33] A DEDICATED PAIN CLINIC BASED IN THE FOOT UNIT HELPS IN THE REDUCTION OF MORBIDITY ASSOCIATED WITH DIABETIC PAINFUL PERIPHERAL NEUROPATHY

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Aim: Diabetic painful peripheral neuropathy (DPPN) is a disabling complication and a significant clinical challenge. Coupled with a limited understanding of pathogenic mechanisms, pharmacologic choices are limited and treatment response not guaranteed. There continues to be a lack of emphasis on DPPN management in diabetes clinics and neuropathic pain review, is usually undertaken during routine diabetes or foot clinic appointments. We report our experience of undertaking a dedicated clinic, based in the diabetic foot clinic, aimed at diagnostic confirmation of DPPN and treatment maintenance.

Method: We report on patients attending a dedicated neuropathic pain clinic from April 2014 to August 2015. A referral pathway through the foot clinic was developed, such that biomechanical and vascular causes of pain were first excluded. Investigations were carried out to rule out secondary causes of neuropathic pain which was subsequently managed according to NICE (UK) guideline CG173.

Results/Discussion: 31 patients (age 67±13 years, type 2 diabetes 68%, males 65%) were reviewed a total of 115 times. Baseline 11-point visual analogue score (VAS) was 7.5±1.6. Although 70% (22/31) had been trialed on at least one neuropathic pain medication in the community prior to referral, only 32% (10/31) were actually taking any such medication at time of initial review. At 6 months, VAS was 5.1±1.5. Approximately 50% of the patients improved their VAS by ≥3, 25% by 1-2 points and 25% did not show any improvement (ANOVA $p<0.001$ for trend). Overall, 22% halved their VAS scores at 6 months. Importantly, 30% (10/31) of the patients had additional coexistent painful aetiologies (DPPN+ group). These were spinal stenosis n=3, lumbosacral entrapment n=3, myositis n=1, cervical compression n=1, paraproteinemia n=1 and B12 deficiency n=1). 6 month VAS was lower in the DPPN+ group (4.7±1.5 v 5.1±1.5) but this did not reach statistical significance.

Conclusion: We demonstrate a significant improvement in pain scores in a dedicated specialist neuropathic pain clinic model. Furthermore, we note that up to a third have associated painful comorbidities mistaken as DPPN, management of which may help improve pain scores. We believe, such focused clinics, delivered through the diabetic foot service will provide the required emphasis and may help relieve the morbidity associated with DPPN.

[P34] THE SIMPLE STAGING SYSTEM IDENTIFIES PATIENTS AT RISK OF ADVERSE CLINICAL OUTCOME: RESULTS FROM A ONE YEAR COHORT STUDY

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Aim: To evaluate the clinical outcome of patients presenting to a specialist diabetic foot clinic at one year follow-up in comparison to their staging in the simple staging system (SSS) of the foot at presentation.

Method: We conducted a retrospective cohort evaluation of patients attending the clinic over a one year period. The clinic uses a Simple Staging System to document the clinical state of the foot at every clinic visit. The SSS grades the foot from Stage 1 to 6 with increasing severity of clinical state: Stage 1, intact and Normal Foot; Stage 2, intact but At Risk Foot (neuropathy, ischaemia or Charcot); Stage 3, is an Ulcerated but Non-Infected Foot; Stage 4, Infected Foot; Stage 5, A Necrotic Foot; Stage 6, Non Salvageable Foot; and Non-Applicable if intact foot but has leg ulceration. We analysed the clinical outcome at one year with regards to probability of admission to hospital and mortality rate and ulcer healing. This was done for a cohort of individual patients who attended the clinic between February and March 2015. Consecutive clinic attendance data was captured on a Silhouette Database over the subsequent year. Data and clinical outcome extracted and analyzed with MS Excel spreadsheet.

Results/Discussion: There were a total of 491 individual patients who attended the clinic between 16th February and 20th March 2015. They subsequently had a total of 4,901follow-up appointments in the subsequent year. At baseline: 1% were staged as Not Applicable, 0.4% as Stage 1, 29.1% as Stage 2, 48.1% as Stage 3, 18.3% as Stage 4, and 3.1% as Stage 5. Over the one year follow-up period, 3% of patients with Stage 2 at baseline needed an admission, and in a sequential increment Stage 3, Stage 4 and Stage 5 had 10%, 19% and 27% probability of an admission respectively. There was also a sequential increment in their probability of death at one year follow-up, with 3% mortality of Stage 3, 7% mortality of Stages 3 and 4, and a 13% one year mortality with a baseline presentation with Stage 5. During the follow-up 15% of patients with a baseline Stage 3 achieved an intact foot i.e. a Stage 2 as did 2% of those with Stage 4 at baseline but none in the group with Stage 5 at baseline. One patient with Stage 5 progressed to Stage 6, depicting a 1/15 (7%) risk of major amputation.

Conclusion: This data partly validates the Simple Staging System with association of an increased risk of adverse clinical outcome in patients with higher SSS score. SSS score of 5 was associated with nearly twice the Relative Risk of mortality compared to Stages 3 and 4. The use of the SSS could help track patients progress as well as help to identify patients in whom care ought to be intensified to help avoid adverse outcomes.

[P35] METHODOLOGY OF A STRUCTURED DIABETIC FOOT EDUCATION PROGRAM (DFEP): A PAN INDIA INITIATIVE

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Aim: The diabetic foot is one of the most important contemporary challenges in India, the diabetic capital of the world.The Diabetic Foot Education Program – India (DFEP-India) is a Pan India programme initiated with the primary objective of updating treating physician's knowledge on
- Prevention of Diabetic Foot
- Management of Diabetic Foot (Debridement and offloading)
- Prevention of Diabetic Foot Complications

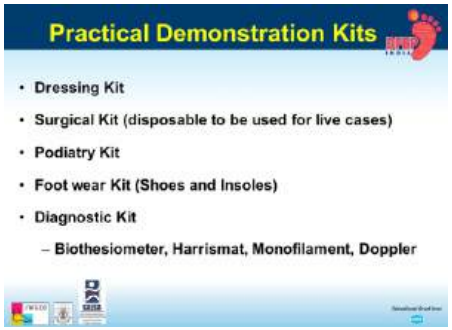
Method: The phase 1 of this pan India course was conducted during the period of April 2014 to Jan 2015 at 20 different centers in India and trained more than 1102 MD physicians. In the Phase 1 during nine hours of continuing medical education, participants were trained with didactic lectures, interactive live & simulated cases, interactive spot diagnosis, discussion & practical demonstration.
The phase 2 (Feb2015 to Jan2016) consisted of
-Distant learning certificate course
-Hands on training workshop for Diabetic foot

Results/Discussion: The course was developed and jointly rolled out under the auspices of International Working Group on the diabetic foot (IWGDF), Southern Arizona Limb Salvage Alliance (SALSA) & Indian College of Physicians (ICP). Phase 1

- Successfully conducted across 20 centers across India
- Participation of 1102 consulting Physicians
- All Doctors invariably rated the programme Excellent & universally appreciated the initiative

Phase 2

- Total 40 workshops in 40 weekends across India
- Duration: 5 hours with one hour of lectures/case discussion (11 am to 4.30 pm)
- Number of participants/workshop: 20 (divided in 4 groups for all activities)
- Faculty: (1) Surgeons and (1–2) Diabetologists/Endocrinologists



5 text modules for distant learning certificate course :

1. Assessment and examination of feet in diabetics (Diagnosing foot at risk)
2. Diabetic neuropathy
3. Diabetic foot infection
4. Neuroischaemic foot and its management
5. Podiatry procedures and Offloading & Shoe

Structured modules with few video lectures on five pre-selected topics were given to all enrolled physicians under the distant learning course. Parallel to this, the practical hands-on training workshops were conducted at 27 centers in India, wherein there was a day workshop with the primary aim to demonstrate practical issues and how to treat patients with diabetic foot lesion.

Conclusion: This programme DFEP Pan India initiative has conclusively proven that

1. There is an unmet need of such mega foot education initiative in India and other developing countries
2. A graded phase 1 and 2 programme has trained around 1100 physicians across the country with the basics and advanced diabetic foot management issues
3. A mix of lectures, video demonstrations, live case demos and live demonstration of 3 kits namely podiatry kit, dressing kit and footwear should be essential components of such programmes and very much appreciated by the participants
4. Interestingly the feedback demonstrated all round rating of the programme as excellent and there was universal appreciation of the DFEP initiative.
5. Expansion of such programmed to tier 4 and tier 3 cities and rural india is the need of the hour

[P36] THE NEED FOR MORE OPEN ACCESS TO SPECIALIST DIABETES FOOT CARE SERVICES: SUPPORTED BY HIGH APPOINTMENT COMPLEXITY SCORE FOR NEW SELF-REFERRED PATIENTS

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Aim: Our clinic has an open access policy which allows patients with foot problems to self-present or self-refer to our specialist foot care service. The aim of this study was to evaluate the complexity of new patient visits to a specialist diabetic foot clinic as a self-referred patient compared to other sources of referrals to the service.

Method: We conducted a six month evaluation of all new patient visits to the foot clinic between September 2015 and February 2016. For each patient visit, a "visit complexity score" (VCS) is calculated to reflect all of the investigations and interventions carried out during the consultation. Each activity is given a point score ranging between 0 and 6 depending on its complexity (e.g. 0 for just foot checks but no procedures needed, 1 for debridement of callus and nail care or blood test, 4 for an incision and drainage of pus, and 6 for minor amputation of a toe under local anesthetic). A total of the points score of all the activities performed during the appointment then equates to the VCS. The new referrals were divided into four groups depending on their source (Self-referred, Community Podiatrist, Secondary Care or General Practitioner (GP)). The VCS was then used to compare the complexity of activities carried out per each referral source. Data was extracted electronically and analyzed with MS Excel spreadsheet. Results reported as Mean±SD.

Results/Discussion: There were 127 new patient referrals which had complete data with source of referral. The overall mean VCS for the 127 appointments was 4.3±2.4 points: 6% of appointments were self-referred with a significantly higher mean VCS of 6.1±2.4 points compared to the overall mean [p=0.011], 9% of appointments were referral by community podiatrist with a significantly lower mean VCS of 4.4±1.9 points compared to the self-referrals [p=0.043], 39% of appointments were referred by secondary care services with a lower mean VCS of 4.4±2.5 points compared to self-referral [p=0.040]. 46% of patients were referred by their GP with a mean VCS of 3.9±2.2points which was also lower than self-referral [p=0.005].

Conclusion: These results indicate that self-referred patients needed high complexity of assessment and intervention and their decision to self-present was well justified. Thus, more of such open access appointments ought to be offered to patients as a mean of facilitating urgent specialist diabetes foot care.

[P37] PLANTAR SURGICAL APPROACH AND MID FOOT STABILIZATION BY EXTERNAL FIXATION IN TREATMENT OF MEDIOTARSAL OSTEOMYELITIS IN ULCERATED MID FOOT CHARCOT NEUROARTHROPATY

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Aim: Midfoot charcot neuroarthropathy is characterized by severe deformity and joint instability of midfoot with inversion of plantar arch and bone protrusion that may leads to chronic plantar ulcer with high risk of midfoot osteomyelitis The aim of study is value safe and efficacy of plantar surgical approach by wide ulcerectomy to remove infected bone together with midfoot stabilisation by external fixation.

Method: From December 2009 to August 2014 we treated 16 patients suggested to major amputation. All patients presented normal vascularisation of affected leg end foot.. Patients were treated by a first surgical procedure performing of ulcerectomy and infected bone removal followed by second surgical look consisted of debridment of bone and deep tissue, suture of plantar ulcerectomy and midfoot and and ankle stabilisation by external fixation. Bone and deep tissue biopsy for histological and cultural specimen were performed. Antibiotic therapy with Daptomic 8 mg/kilos/day and piperacillin-tazobactan 16 mg/day was applied the day before first surgical step and modified when obtained results of cultural specimens. After three months external fixation was removed and patients were allowed to walk with custom shoes with biomechanics rigid sole and moulded insole.

Results/Discussion: We observed healing of 14 patients (87%) while 2 patients (13%) shown progression of osteomyelitis that requested major amputation. We didn't observe progression of bone infection in the 14 patients healed.

Conclusion: Our study demonstrate that aggressive plantar surgical approach of mediotarsal ostemielyetis in ulcerated midfoot charcot neuroathropaty allow to obtain an elevate rate of healing reducing dramatically risk of major amputation

[P38] CONSERVATIVE APPROACH IS A GOOD OPTION IN DIABETIC FOOT SURGICAL TREATMENT?

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Diabetic patients with major amputation have a bad quality of life, prognosis and are expensive for health system. To avoid major amputations is the mission of diabetic foot treatment. Minor amputations (toe, ray, transmetatarsal, lisfranc, chopart) often help to obtain limb salvage, but few data are available about the best solution in partial foot amputation, risk of proximal amputation after foot surgery, outcome of patients.

Aim of the study: To evaluate foot and general outcome after minor or partial foot amputations in diabetic patients.

Method: Interrogation of surgery database between January 2012 and December 2014, founded 1195 surgical treatment on diabetic foot. For this study, we excluded surgical procedures on acute drainage, calcanectomy, skin and dermal graft, arthrodesis. We obtain 704 surgical procedures of minor and partial amputation of the foot. 99% of patients have type 2 diabetes, mean age was 72±11 years (mean ± SD), 82% were male, and a long history of diabetes 18 ± 11 years was founded. Peripheral neuropathy was present in 669 (95%) patients; peripheral arterial disease in 515 (73%), of them 416 (59%) underwent revascularization (94% endovascular, 6% surgical) before surgical intervention on foot.

Results/Discussion: We perform 359 surgical procedures at toe level (121 toe amputation, 237 partial toe amputation), 281 procedures at ray level (169 ray/rays amputation, 112 metatarsal bone resection), 65 minor amputations (53 transmetatarsal, 12 chopart). We compare characteristics of patients with different levels of treatment: non-statistical significant difference were founded in patient's age, diabetes duration, incidence of vascular disease and neuropathy, revascularization. Patients with forefoot amputation presented higher rate of ischaemic heart disease and dialysis (p<0.01). Outcome: of 359 patients treated at toe level 44 (12%) have ray amputation, 43 (12%) have forefoot amputation, 7 (2%) major amputation. Patients treated at metatarsal ray level: 18 (6%) have forefoot amputation, 2(1%) major amputation. Patients treated with forefoot amputation: 5 (8%) experienced major amputation. Mean follow up was of 22.1 ± 11.4 months. At follow up, 46 (12.8%) of patients treated at toe level died, 23 (8%) patients treated at ray level, 18 (28%) with forefoot amputation.

Conclusion: Data from this study indicate that conservative surgery of diabetic foot is a valid approach. Partial amputation of forefoot have a low percentage of proximal amputation. Forefoot amputation have higher rate of death at follow up respect more distal foot amputation, but they presented higher levels of comorbidity (terminal renal failure and ischaemic heart disease). In diabetic foot surgery, conservative approach lead to a lower risk of major amputation and permit a more functional autonomy.

		Basal characteristics		Outcome			
Level of surgical treatment	**n.**	**Ischaemic heart disease**	**Dialysis**	**Ray amputation**	**Forefoot amputation**	**Major amputation**	**Death**
Toe level	358	27 (7.5%)	32 (9%) p<0.01	44 (12%)	43 (12%)	7 (2%)	46(13%)
Ray level	281	22 (8%)	11 (4%)		18 (6%)	2 (1%)	23 (8%)
Forefoot amputation	65	12 (18%) p<0.01	17 (26%) p<0.01			5 (8%) p=0.01	18 (28%) p<0.01

[P39] INDOCYANINE GREEN FLUORESCENCE ANGIOGRAPHY IN DIABETIC PATIENTS WITH PERIPHERAL ARTERIAL DISEASE

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Background and aims: To evaluate diagnostic value of indocyanine green (ICG) angiography (ICGA) with intravenous injection ICG for assessment peripheral blood flow in diabetic patients with peripheral arterial disease (PAD).

Materials and methods: Prospective study included 23 diabetic patients with PAD who underwent percutaneous transluminal angioplasty (PTA) in 23 lower limbs. Diagnosis and treatment of PAD was based on recommendation of IWGDF (Hague, 2015). Transcutaneous oxygen tension (TcpO2) and ICGA were used to assess skin foot perfusion in ulcer site. To perform ICGA, charge-couple device camera, a laser (800 nm) - the SPY system (Novadaq, Bonita Springs, Fla) and intravenous fluorescent ICG were used. Time to maximum intensity (Tmax) in ulcer site during ICGA was recorded. Patency of lower limb arteries was evaluated by duplex ultrasound (DU). The degree of tissue damage was assessed according to Wagner classification.

Results: There were 23 diabetic patients with PAD. The mean age was 66,7,± 9,8 years, HbA1c 8,25±1,53%, diabetes duration 16,5[0,8-43] years, diabetes type 1/2-4/19, man/woman 61/39%. There were comorbidities: arterial hypertension in 93%, myocardial infarction in 18,75%, stroke in 16,6%, dyslipidemia in 70,8%, smoking in anamnesis in 56,25%, chronic kidney disease (stage 3-5) in 23%. Stenosis >50% of vessel diameter and occlusions were located in the iliac/femoral-popliteal axis in 4,34 % (n=1), exclusively in the infrapopliteal axis in 39% cases (n=9), and in both femoral-popliteal and infrapopliteal axis in 57% (n=13). All patients were divided into 2 groups according to the severity of PAD: group A - with mild PAD and nonhealing foot ulcers during 6 weeks despite of standard treatment, TcpO2>25<40 [28; 36] mmHg; group B - 12 patients with critical limb ischemia (CLI) and foot ulcers: TcpO2 < 25 mm Hg [9;21]. Groups A and B were comparable in comorbidities, severity of lower limb arteries obstructions and degree of tissue damage (Wagner 2-3, p-value<0,05).

Conclusion: ICGA is a good tool for visual and rapid quantitative assessment of regional foot perfusion. ICGA may be important additional method in PTA decision-making process in discussible cases. It was pilot study and further clinical investigations are required to refine cut-off of ICGA parameters for detection diabetic patients with insufficient ulcer site perfusion to achieve ulcer healing and clarify the indications for revascularization.

[P40] SQUARED FASCIOCUTANEOUS RANDOM PLANTAR FLAPS IN THE TREATEMENT OF NONINFECTED DIABETIC PLANTAR ULCERS

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Aim: Off-loading cast has not been widely used in treatment of plantar ulcer due to scarce acceptance by patients and high risk of side effects. We decided to value safe and efficacy of a squared fascio-cutaneous random plantar flap to cover plantar ulcers.

Method: From December 2012 to February 2013 we consecutively enrolled 23 diabetic patients with deep neuropathic or neuroischemic plantar ulcer. 9 patients were submitted to a percutaneous transluminal angioplasty and 18 patients (78%) to bone surgery as follows: a) 10 metatarsal heads removal; b) 3 uploading distal metatarsal osteotomy; c) 2 first metatarsal-phalangeal joint resection with ray stabilisation by K-wire; d) 1 midfoot esostectomy; e) 1 sesamoidectomy f) 1 partial calcanectomy. A squared fasciocutaneous random plantar flap was performed in all patients. 2 patients were excluded from analysis because loading of affected feet.

Results/Discussion: Healing rate was 100% in remaining 21 patients. In 15 patients (71,5%) we observed healing by first intention while in 5 (24%) by second intention and in 1 (4.5%) by means of surgical revision. We observed a healing time by first intention of 30±13 days, by second intention of 86±40 days and a total healing time of 44±31 days. During the follow up of 724±275 days any relapsing ulcer was observed but there was one transfer ulcer on adjacent metatarsal head.

Conclusion: In conclusion squared fascio-cutaneous plantar flaps can be considered a safe and effective surgical option in treatment of neuropathic plantar ulcer considering high healing rate, short healing time and low rate of recurrences.

[P41] MEDIUM-TERM FOLLOW UP IN PATIENTS WHO WERE PERFORMED CURATIVE SURGERY IN NEUROPATHIC FOREFOOT ULCERS IN PATIENTS WITH DIABETES MELLITUS

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Aim: The aim of this study was to analyse the rates of reulceration and recurrence in patients with diabetes mellitus (DM) with neuropathic ulcers who were performed curative surgery.

Method: A descriptive study involving 28 patients with DM and neuropathic forefoot ulcers. Patients suffering critical limb ischaemia (CLI) or Charcot foot (OAND) and complicated with osteomyelitis were excluded. Mean age of patients was 62,34 ± 8,22. 18 patients (64.3%) were male and 10 (35.7%) female. 4 patients (14.3%) had DM type 1, and 24 (85.7%) DM type 2. DM suffered time was 13.44 ± 8.28 years. HbA_{1c} average was 7.23% ± 1.24. 8 patients (28.6%) suffered retinopathy, and 5 (17.9%) nephropathy. 17 (60,71%) had previous minor amputations. Surgical techniques performed were metatarsal head resection or interfalangeal joint resection. The mains outcomes variables evaluated in the present study were reulceration and ulcer recurrence.

Results/Discussion: The following surgical procedures were performed: 17 (60,71%) metatarsal head resection and 11 (39,28%) interfalangeal joint resection. The median follow up time was 18 months (interquartile range 7.97-30.05) minimum 1.63; maximum 57,43. During the follow-up period, a total of 2 patients (7.1%) suffered a reulceration and only 1 patient (3,6%) suffered an ulcer recurrence. The cases of reulceration were in adjacent metatarsal head. The patient who suffered recurrence and reulceration were performed a metatarsal head resection. No different were found in location of the ulcer and reulceration (p 0.409) and recurrent (p 0.607) results. No significant association was found between previous amputation and recurrence (p 0.290) or reulceration (p 0.343).

Conclusion: Reulceration and ulcer recurrences were common complications in patients undergoing curative surgery. When patients suffer rigid foot deformities, frequent recurrences or patients whose orthopaedic treatment is not effective, curative surgery could be considered. Surgical intervention for chronic deformities and ulcerations has become an important component in the management of patients with DM. Surgical correction of the structural deformity is an option to heal ulcers and reduce the risk of recurrence. Criteria for selecting patients must to be as clear as possible, must discard patients with CLI, big deformities as OAND, limited activity, chronic kidney disease, and very bad metabolic control.

[P42] DIABETIC FOOT SURGERY PERFORMED BY DIABETOLOGISTS IN A THIRD LEVEL CENTRE: RESULTS OF 15 YEARS OF ACTIVITY

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Aim: To evaluate surgical outcomes of a third-level centre managed by diabetologists in the last 15 years.

Method: We retrospectively evaluated a total of 1.857 DF patients (Age 67.1±12.3 yrs, diabetes duration (DD) 19.2±9.8 yrs, HbA1c 8.1±2.0%) surgically treated in our Department between 2000 and 2014, divided in 3 groups: Group 1, patients treated between 2000 and 2004 (397 pts), group 2, between 2005 and 2009 (728 pts) and Group 3, between 2010 and 2014 (732 pts). Main clinical outcomes [peripheral revascularization rate (PR), healing rate (HR), healing time (HT), major amputation (MA) and death (D) rates] were compared between the groups.

Results/Discussion: No difference was observed between the Groups, except for age, significantly ($p<0.05$) higher in Group 3 (70.6±14.7 yrs) than in Group 1 (64.4±11.6 yrs) and 2 (65.1±11.2 yrs). Total HR was 81.6% (HT 143.3±53.8 days); total MA rate was 4.9% and D rate was 27.9% during the follow up period. No difference emerged comparing HR and MA between the groups; HT was significantly ($p<0.05$) shorter in group 3 (104±44 days) than in Group 2 (169±72 days) ad 1 (235±67 days). D rate was higher ($p<0.05$) in Group 1 (41.7%) than in Group 2 (20.7%) and 3 (24.2%). PR rate was 19.4% in Group 1, 28.1% in Group 2 and 53.8% in Group 3 ($p<0.05$).

Conclusions: Despite the increasing age and complexity of patients our data show improvement of outcomes alongside 15 years of activity, probably due to better surgical techniques, more aggressive medical therapy and a more effective treatment of critical limb ischemia.

[P43] ESTIMATION OF WOUND HEALING POSSIBILITY (BASED ON THE NUMBER OF AMPUTATIONS AND MORTALITY OF PATIENTS) IN DEPENDENCE OF PERFUSION IN CASES OF SYNDROME OF DIABETIC FOOT

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Aim: Determine the actual boundaries of the critical lower limb ischemia in patients with diabetic foot syndrome.

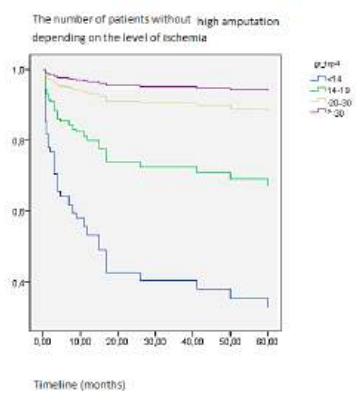
Methods: The study included 201 patients. 159 at the time of the study had tcpO2<30 mmHg (study group-SG) and 42 patients with 30<tcpO2<40 mm Hg (control group-CG). Observation of patients from 36 to116 months. The criteria for evaluation: General quantity of amputation; Quantity of high amputation; The level of mortality. SG was divided into subgroups according to level of tcpO2. It was be using Cox regression for analysis.

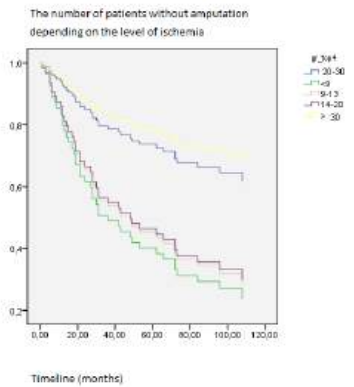
Results: The number of patients without amputation between the CG and subgroups tcpO2 21-30 mm Hg is not different (p=0.873). The difference between the subgroups with tcpO2 (14-19) and (20-30) significant (p<0.001). The risk of amputation in the subgroup tcpO2 (<14) in 7.401 times higher than in the sub group tcpO2 (20-30).

In the analysis of high amputations there is a lack significant difference between the CG and subgroups with tcpO2 (20-30) and (14-19) (p=0.533 and p=0.063, respectively). High amputation risk in the sub group (<14) 6.51 times higher in subdruppe (15-19) in a 18 times higher in subgroup (20-30) of 1.41 times higher than in the CG.

The mortality rate of patients. Critical limb ischemia is a mirror of the status of all vessels. The mortality rate in the CG and subgroup (20-30) did not differ (p=0.144). There is also no significant difference between the groups (<14) and (14-19) (p=0.759). Significant difference was between the subgroup (20-30), as subgroup (14-19) and, as (<19) (p=0.031 and p=0.039, respectively). The difference may be higher because we did not have full information about the deceased.

Conclusions: The actual level of critical ischemia in patients with diabetes is below is in the range of 20 mm Hg.





[P44] IS THE PERIPHERAL VASCULAR DISEASE OF PATIENTS TYPE 2 DIABETES DIFFERENT FROM THAT OF PATIENTS WITH TYPE 1 DIABETES?

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Aim: It is usually reported that peripheral vascular disease (PVD) worsens with ageing. We aimed to investigate whether there was a different impact of ageing in macrovascular and microvascular parameters of the diabetic foot between patients with Type 1 diabetes compared to Type 2 diabetes

Method: We evaluated consecutive patients attending the diabetic foot clinic with foot ulceration. Patients had measurements taken from the arm and booth feet for ABPI, TBPI, forefoot $TcpO_2$, forearm $TcpO_2$, with the derivation of $TcpO_2$ Index (forefoot $TcpO_2$ divided by forearm $TcpO_2$), and forefoot laser Doppler flowmetry before and after heating to derive the percentage increase. We compared measurements in the non-ulcerated foot in two groups: patients with Type 1 vs Type 2 diabetes, and sub-analysed the impact of age, duration of diabetes and vibration perception threshold (VPT). Data analysed with IBM SPSS ver 22. Data reported as Mean±SD.

Results/Discussion: There were a total of 67 patients, 21% with Type 1 diabetes and 79% with Type 2 Diabetes. There was no difference in mean age 61±13 vs 63±12 years [p=0.558] and VPT 42±12 vs 40±11 [p=0.778], but there was longer duration of diabetes in Type 1, 41±18 vs 14±8 years [p=0.001]. There was no significant difference between the mean ABPI; 1.19±0.38 vs 1.14±0.31 [p=0.667], and a non-significant correlation with age in Type 1 patients, r=0.048 [p=0.876] but there was a significant negative correlation with age in Type 2 patients; r = -0.488 [p=0.001]. There was no difference in mean TBPI 0.55±0.27 vs 0.68±0.24 [p=0.142], but a larger proportion of the Type 2 patients compared with Type 1 patients correlated with age r^2=0.099 vs r^2=0.306 [p=0.001]. There was no significant difference between mean forefoot $TcpO_2$ 52±13mmHg vs 47±15mmHg [p=0.253], and also no difference in the correlation in Type 1 and Type 2 patients with age r= -0.263 vs r= -0.306 [p=0.888]. However, their difference in correlation with age is significant if forefoot $TcpO_2$ is expressed as an index of the forearm $TcpO_2$ (r^2=0.052 vs r^2=0.220 [p=0.001]), postulating that $TcpO_2$ Index may be a more sensitive marker than forefoot $TcpO_2$ to detect PVD. The percentage increase in Doppler flowmetry with heating was not significantly different, 249% vs 375% [p=0.058] and there was no significant correlation with age in Type 1 (r=0.138; p=0.638), but a significant negative correlation in patients with Type 2 (r= -0.384; p=0.005).

Conclusion: These studies suggest that PVD in Type 2 diabetes correlates with age unlike PVD in Type 1, despite having a similar age and an apparent shorter duration of diabetes. Thus there needs to be more effort in earlier diagnosis and more aggressive treatment of PVD in patients with Type 2 diabetes.

[P45] INTEROBSERVER RELIABILITY OF THE ANKLE-BRACHIAL INDEX (ABI), TOE-BRACHIAL INDEX (TBI) AND DISTAL PULSES PALPATION IN PATIENTS WITH DIABETES

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Aim: To analyze the interobserver reliability of the ankle-brachial index (ABI), the toe-brachial index (TBI) and distal pulses palpation in patients with diabetes depending on the training of the professional involved.

Method: We conducted a prospective study between November and December 2016 in a Diabetic Foot Unit, which included 12 outpatients with diabetes. The ABI and TBI were assessed by three clinicians with different levels of experience using a manual 8 MHz Doppler (Doppler II, Huntleigh Healthcare Ltd, South Glamorgan, UK), and the toe systolic pressure was taken with a digital plethysmography (Systoe, Atys Medical, Quermed, Madrid). The ABI and the TBI were calculated, separately for each leg, with the equations of the ankle or toe pressure readings divided by the highest brachial reading between the right and left arms. Distal pulses (posterior tibial and dorsalis pedis artery) were assessed for each clinician.

Results/Discussion: Twenty three ABI, eighteen TBI and twenty four distal pulses were assessed in our study population. Table depicts the Intraclass Correlation Coefficient and the Kappa Coefficient among the clinicians with different levels of experience.

	Intraclass Correlation Coefficient (CCI) **Kappa Coefficient (K)**			**P Value**			**Strenght of agreement**
ABI (n=23)	CCI_{12}=0,907	CCI_{13}=0,951	CCI_{23}=0,923	<0,001			**Very Good**
TBI(n=18)	CCI_{12}=0,718	CCI_{13}=0,885	CCI_{23}=0,781	0,006	<0,001	0,001	**Good**
Posterior Tibial (n=24)	K_{12}= 0,667	K_{13}=0,5	K_{23}=0,5	0,001	0,009	0,014	**Good/Moderate**
Dorsalis Pedis (n=24)	K_{12}= 0,538	K_{13}=0,474	K_{23}=0,746	0,003	0,006	<0,001	**Moderate/Low/ Good**

Conclusion: Palpation of distal pulses in patient with diabetes is operator dependent among clinicians with different levels of experience, nevertheless the assesments of ABI and TBI are not operator dependent. We observed a low agreement, among experienced and unexperienced clinician, in the palpation of dorsalis pedis arteries of our patients.

[P46] SURGICAL OUTCOMES IN PATIENTS WITH OSTEOMYELITIS LOCATED ON THE SESAMOIDS TREATED BY CONSERVATIVE SURGERY. A TECHNICAL PROPOSE

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Aim: The aim of this study was to analyse the efficacy and safety of sesamoidectomy and sesamoidectomy combined with another techniques in the treatment of osteomyelitis located in sesamoids in patients with diabetes mellitus (DM).

Method: 18 patients with DM and neuropathic ulcers beneath the first metatarsal head with suspect of osteomyelitis treated with conservative surgery performed at Diabetic Foot Unit of University Complutense of Madrid were included in an observational study. Patients with deformity in the first metatarsal joint were included (HR and / or HAV). Patients suffering critical limb ischemia (CLI) and necrotizing soft tissue infections were excluded. Mean age of patients was 61.06 ±10.40 years. 17 (94.4%) were male and 1 (5.6%) female. 5 (27.8%) had DM type 1, and 13 (72.2%) DM type 2. Median DM duration was 14.50 years [IR: 8.25-35.5]. HbA_{1c} average was 7.67% ±1.62. Median suffering time from ulcer before surgery was 12 weeks [IR: 5-17]. Surgical techniques performed were sesamoidectomy, or sesamoidectomy combined with osteotomy of the metatarsal head or osteotomy of the proximal phalange. After the surgery all patients were treated with good wound care and offloading. Primary outcomes were time to healing, reulceration, ulcer recurrence, minor amputation, major amputation and exitus.

Results/Discussion: The following surgical procedures were performed: 5 (27.8%) simple sesamoidectomy and 13 (72.2%) combined techniques. Median healing time was 9 [IR: 4-17] weeks without statistically differences between procedures (p 0.12). Median follow up time was 39.5 [IR: 21-127] weeks. During follow-up, 2 patients (11.1%) suffered a reulceration, 1 patient (5.6%) suffered a major amputation and 1 patient (5.6%) had an ulcer recurrence. Any patients suffered minor amputation or exitus. No different statistically association were found between the technique procedure and develop a reulceration (p 0.86) or ulcer recurrence (p 0.40).

Conclusion: Conservative surgery procedures performed on patients with osteomyelitis located in sesamoids were safe and effective, with a minor complications and a low rate of reulceration and recurrences. Sesamoidectomy techniques could be considered like an option in this patient profile.

[P47] EVALUATION OF THE USAGE SPECIAL CUSTOMISED PROTECTIVE FOOTWEAR IN PREVENTING ULCERATIONS AND AMPUTATIONS OF THE LOWER EXTREMITIES IN PATIENTS WITH NEUROPATHY

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Background and aims: Diabetic neuropathy is the most common complication of diabetes mellitus (DM) as it affects a significant number of patients. Increased mechanical pressure, in combination with the lack of protective sensory feedback of the heel due to diabetic neuropathy, are the reasons for skin lesions capable of developing ulcerations. The purpose of the present study is to evaluate if the application of specially designed footwear improves the heel pressure parameters, thus preventing ulcerations in the lower extremities of diabetic patients and whether it should be recommended for inclusion into the early diagnosis and prevention of amputations.

Materials and methods: The study population included 20 volunteers without DM and without any neuropathies (control group) and 60 patients with DM divided into 2 groups each of 30 patients (one group was provided with the special customised protective footwear and the other without special footwear). All participants underwent the following examinations and measurements: Measurement of Nerve Conduction Test, Electromyography, CAN evaluation tests, plantar pressure parameter measurement using a pressure platform and specialised software, Doppler of the arteries and veins of the lower extremities, Glucose tolerance test, MNSI test (Michigan neuropathy screening Instrument). Anthropometric and biochemical parameters, including traditional cardiometabolic risk factors as well plasma levels of iron, B12 and ferritin were obtained. According to recent studies and the possible association of anaemia with diabetic foot ulceration all participants with anaemia were treated accordingly. Assembly of specially formed sole and footwear (Anesii Frontis Medical) for each patient based on present circumstances and dynamic plantar pressure value correction, according to the measurements of the plantar measuring device. Statistical analysis was performed using SPSS 17.0 statistics software.

Results: A statistically significant positive correlation ($p<0.05$) was found between the degree of neuropathy and the decline and deviation from the physiological plantar pressure parameters. A positive correlation ($p<0.05$) was also observed between the aforementioned parameters and diabetes duration. As for the two groups of patients, from those who were not provided with the special diabetic footwear with correctional soles, 8 revealed ulcerations on the lateral surface of the sole, 4 revealed ulcerations on different areas of the sole and 2 were forced to undergo amputation of the hallux and the third distal phalanx respectively. From the patients provided with the corrective footwear, only 2 revealed ulcerations, but those were not localized on the surface of the foot sole.

Conclusion: The use of footwear with specially formed soles appear to correct the alterations of the plantar pressure parameters, which are caused by subclinical neuropathy in early diabetic patients and contributes to the prevention of ulceration formations and amputations of the lower extremities.

[P48] RELATIONSHIP OF PLANTAR PRESSURE AND GLYCEMIC CONTROL IN TYPE 2 DIABETIC PATIENTS WITH AND WITHOUT NEUROPATHY

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The most common form of diabetes is type 2 diabetes. Foot disease is a common complication of diabetes that can have tragic consequences. Abnormal plantar pressures are considered to play a major role in the pathologies of neuropathic ulcers in the diabetic foot.

Aim: To examine Relationship of Planter Pressure and Glycemic Control in Type 2 Diabetic Patients with and without Neuropathy.

Subjects and methods: The study was conducted on 30 type 2 diabetic patients without diabetic neuropathy (Group I), 20 patients with type-2 diabetes mellitus with diabetic neuropathy (Group II), Thirty control healthy volunteers (Group III). BMI calculation, disease duration and Hemoglobin A1c were recorded. Plantar pressure was recorded for all patients using the Mat-scan (Tekscan, Inc.vers. 6.34 Boston USA) in static conditions (standing) and dynamic conditions (taking a step on the Mat-scan). Plantar pressures (kPa) were determined at the five metatarsal areas, mid foot area, medial and lateral heel areas and medial three toes.

Results: Static and dynamic plantar pressures in both right and left feet were significantly higher in diabetic with neuropathy group than in control group in measured areas.($P<0.05$). Furthermore, static and dynamic pressures in right and left feet were significantly in diabetic with neuropathy group than in diabetic without neuropathy group in measured areas.($P<0.05$). On comparison between controls and diabetic without neuropathy group there was a significant difference in plantar pressures especially in metatarsal areas. ($P<0.05$) Factors like BMI, Hemoglobin A1c and disease duration showed no significant correlation with the plantar pressure.

Conclusion: Pressure distribution measurement techniques are useful in analyzing and understanding the mechanical behavior of the human foot during static and dynamic loading situations in normal, type2 diabetes, and diabetes with neuropathy subjects. Patients with diabetic neuropathy have elevated plantar pressures compared to patients without neuropathy and control group. Neuropathy as a consequence of diabetes may explain impaired distribution of plantar pressure in subjects with diabetes.

[P49] WHICH IS THE MOST FREQUENTLY ABNORMAL NEUROPATHY TEST IN PATIENTS WITH TYPE 2 DIABETES AND NEUROPATHIC FOOT ULCER?

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Aim: To examine which is the most frequently abnormal neuropathy test in patients with type 2 diabetes (T2DM) and neuropathic foot ulcer.

Method: This study included 61 patients (30 men, 31 women) with mean age of 64.1 years and mean T2DM duration of 14.1 years having neuropathic foot ulcers. The latter were diagnosed by the clinical manifestation and the neuropathy disability score (NDS) using a threshold NDS≥3. The following 5 neuropathy tests were evaluated: indicator test Neuropad, Ipswich Touch Test (IpTT), automated sural nerve conduction study using the NC-stat® DPNCheck™ device, 10 g Semmes Weinstein monofilament (SWMF), and vibration perception threshold (VPT) using a neurothesiometer. These neuropathy tests were scored as normal or abnormal.

Results: Abnormal results were seen as follows: indicator test Neuropad in 59 patients (96.7%), IpTT in 49 patients (80.3%), SWMF in 58 patients (95.1%), NC-stat® DPNCheck™ in 55 patients (90.2%) and VPT in 58 patients (95.1%).

Conclusion: All 5 tests yielded positive results with frequencies >80%. The most frequently abnormal neuropathy test was the indicator test Neuropad, very closely followed by the SWMF and the VPT.

[P50] NEUROPATHY IS MORE COMMON THAN PERIPHERAL VASCULAR DISEASE OR DEFORMITY AS A RISK FACTOR FOR DIABETIC FOOT IN URBAN INDIAN POPULATION

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Aim: 69 million people suffer from diabetes in India who are likely to develop chronic complications. Annual screening is very important to detect and treat early complications. Screening for complications are not done in a structured way in India and Diabetic Foot screening is one of the most neglected field. It is due to the lack of education both of patients and that of health care providers. In order to address this we have developed a concept of mobile screening using a van, which can be taken to sub-urban areas for screening for chronic complications of diabetes. We wanted to analyse various risk factors present for diabetic foot ulceration in this population.

Method: We used 12 mobile vans to drive to primary care practices of urban and sub-urban India across Delhi, Kanpur, Lucknow, Hyderabad, Pune, Chennai, Bangalore & Cochin. Mobile vans were equipped with screening for all complications of diabetes including retinal camera, point of care pathology test, ECG and detailed foot assessment tools. This was performed by trained nurses using standard operating procedure. We screened 5000 subjects within the last 6 months.

Results/Discussion: Foot data was available on 969 subjects out of which 566(58.4%) subjects were males. Mean age was 54.1 (+/- 11.5) years. 55 (5.7%) subjects needed active treatment on the spot for active ulcers of painful corn. Data on shoes were not available on 91 subjects or were not wearing shoes. 637 (72.6%) were not wearing appropriate footwear. Neuropathy in the form of absent monofilament sensation was present in 149 (15.4%) subjects. 34 had absent Dorsalis Pedis and 35 had absent Posterior Tibila pulses. 34 subjects had a history of foot ulcers and 16 had undergone amputations in the past. Foot deformity was present in 38 subjects.Fissures were the most common abnormality present in 452 (46.6%) of subjects. 434 (44.8%) had symptoms of painful neuropathy.

Conclusion: High risk foot is present in 15% of these subjects due to neuropathy but peripheral vascular disease was rare. This may be due to younger age of this population or even due to early cardiovascular death in subjects with vascular disease. Foot deformity was less common in this population possibly due to use of open shoes. Symptoms of painful neuropathy was very common but these were usually mild not needing treatment. Despite this foot education and use of appropriate footwear is lacking. There is a need to increase awareness of diabetic foot problem in India.

[P51] CORNEAL CONFOCAL MICROSCOPY AND CARDIOVASCULAR AUTONOMIC FUNCTION TESTS FOR DETECTING DIABETIC NEUROPATHY IN CHILDREN

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Aim: Identification of early markers diabetic neuropathy by corneal confocal microscopy and cardiovascular autonomic function test with spectral analysis of heart rate variability in diabetic children.

Methods: 44 patients with type 1 diabetes mellitus (DM) mean disease duration 4,5 (1-5) years, 6 patients with maturity onset diabetes of the young - 2, 3 (MODY), mean disease duration 4,1 (1-5) years; 5 patients with type 2 DM**,** mean disease duration 2,75 (1-4) years; and 30 nondiabetic healthy control subjects were recruited in the study. Informed consent was obtained from all patients. All patients and control subjects underwent an evaluation of neurologic signs (Neuropathy Disability Score), symptoms according to the neuropathy symptom score and autonomic cardiovascular tests with spectral analysis of heart rate variability (the low-frequency component (LF), high-frequency component (HF), the LF/HF ratio). All patients underwent examination with the Heidelberg Retina Tomograph III in vivo corneal confocal microscopy (CCM). CCM was performed with assessment of corneal nerve fiber density (CNFD). HbA1c, total cholesterol, high-density lipoprotein, low-density lipoprotein, triglycerides (TG) was measured.

Results: No significant difference was found in vibration, pin prick and temperature perception. CNFD was significantly lower in participants with DM compared to control group (27.7 ± 9.1 vs 35.5 ± 9.4 fibres/mm^2; p<0,05). The subjects with type 1 DM showed a lower LF and HF component of heart rate variability, and a lower LF/HF ratio. Modifications in heart rate variability characterized by a reduction in both sympathetic and parasympathetic activity (changes in unmyelinated nerves). Mean HbA1c in patients with type 1 DM was 8.7 % (5.5-17.9), type 2 DM – 6% (5,5 – 7,7), MODY – 6 % (4,4 – 8,1). Only 10 patients had lipid profile in normal range. CNFD significantly negatively correlated with HbA1c (r= -0,4; p<0,05), TG (r=- -0,3; p<0,05), diabetes duration (r= -0,78; p<0,05).

Conclusions: This study demonstrates significant abnormalities in corneal nerve structure in children with different types of diabetes in early stages of the disease (duration up to 5 years), despite normal Neuropathy Disability Score. Prospective studies are needed to show the prognostic value of CCM and autonomic cardiovascular testing and clarify the optimal way for screening and management of diabetic neuropathy.

[P52] EFFECT OF ORTHOPEDIC FOOTWEAR CONCEPTS ON PLANTAR PRESSURE RELIEF AND PATIENT SATISFACTION IN PATIENTS WITH DIABETES MELLITUS

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Aim: To evaluate the effect on pressure relief and patient satisfaction of different innovative footwear concepts for the high-risk diabetic foot that use pressure analysis in design and evaluation.

Method: Twenty-four diabetic patients (15 male, mean age 65.8 years) at high ulcer risk were tested in this cross-sectional study in four different orthopedic footwear concepts: 1) fully-custom-made shoes, evaluated and modified based on in-shoe pressure, 2) custom-made insoles, evaluated and modified based on in-shoe pressure, 3) custom-made insoles, designed based on barefoot pressure and foot shape data, and modified based on in-shoe pressure, and 4) custom-made insoles, designed and manufactured using computer-assisted automated techniques based on barefoot pressure and foot shape data. Concepts 2-4 were tested in the same extra-depth shoes with a stiffened rocker outsole. Footwear concepts were evaluated in random order with Pedar-X during walking at standardized comfortable speed. Peak pressures were calculated for the metatarsal heads, hallux, midfoot and heel regions. Patient satisfaction was assessed using a Visual Analogue Scale (score 0-10) for walking comfort, shoe fit, shoe weight and appearance. Outcomes were compared across concepts using repeated measures ANOVA (P < 0.05).

Results/Discussion: The lowest mean peak pressures at the metatarsal heads were achieved with footwear concept 1 (117-141 kPa), then 2 (112-155 kPa), and then 3 (119-173), compared to concept 4 (134-199). In >92% of cases with concepts 1 - 2 and in >75% of cases with concept 3, metatarsal head pressures were <200kPa, a level found to indicate some protection against ulceration. Lowest peak pressures were generally found with fully custom-made shoes (concept 1), but only at the first metatarsal head peak pressure were significantly lower compared to all other concepts (p <.005). Hallux pressures were not significantly different between footwear concepts. Highest satisfaction on walking comfort (mean score 7.2) and shoe weight (mean score 8.3) was found with concept 3, and on shoe fit (mean score 7.6) and appearance (mean score 6.9) with concept 1.

Conclusion: Lowest peak pressures were found in those footwear concepts that used in-shoe pressure to guide footwear modifications after delivery, with expectedly the best results found for the most adapted shoes, the fully custom-made shoes. This does not come at the expense of patient satisfaction, but design and manufacturing costs should be taken into account, as these may differ between concepts, possibly affecting the cost-effectiveness of pressure relief. Design and manufacturing principles from these footwear concepts may be used for definition of the most effective shoe for high-risk diabetic patients.

[P53] UTILITY OF SUDOMOTOR FUNCTION TEST AS A CLINICAL TOOL IN RISK STRATIFICATION SYSTEM OF DIABETIC PATIENT

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Aim: To identify the neurological screening clinical test that allows earlier and most accurate identification of patient's risk to developing diabetic foot ulcer (DFU).

Method: Follow-up prospective study with 263 patients from the Diabetic Foot Unit of the Complutense University of Madrid enrolled consecutively between July 2011 and April 2015. Diabetic patients without active foot ulcer were classified by the International Working Group of Diabetic Foot (IWGDF) risk stratification system. Diabetic neuropathy was evaluated according to the results of Semmes-Weinstein Monofilament (SWM)/Biothesiometer and on the other hand by Sudomotor function test (SFT).

Results/Discussion: 60 (22.8%) patients developed DFU during a mean follow-up of 41.55 ± 3.5 [35-48] months. 10 (16.7%) patients who were diagnosed diabetic neuropathy by the SWM/Biothesiometer and were classified into the group risk 0 (without risk to develop foot ulcer) developed foot ulcer during the follow-up. In contrast, any patient was included according to the diagnosis of SFT into the group risk 0 that developed DFU during the follow-up.
SFT was considered independent and statistically significant factor in the final Cox regression model of DFU prediction during the follow up [p=0.002; HR: 4.3 (CI: 1.7-11.1)].
The diagnostic prediction model regarding the development of DFU in follow-up shown areas under the ROC curves of 0.77 according the results of SWM/Biothesiometer (83.33% of sensitivity and 50.74% of specifity) and 0.81 according to the SFT results (100% of sensitivity and 31.53% of specificity).
Risk stratifications systems of diabetic patients introduce diabetic neuropathy in lower levels of risk (level 1 or 2). However, there is no consensus on which or how many test neurological screening are needed to consider a patient as neuropathic. There is no unanimity among the authors about what is the most accurate clinical test for diagnosis diabetic neuropathy. The risk stratification systems in the literature evaluate diabetic neuropathy by SWM/Biothesiometer, but some studies have already doubts about its diagnostic accuracy.
In our study, SFT shows 100% of sensitivity to predict the risk of development DFU, because it was affected in most of the patients that developed an ulcer at follow-up period.

Conclusion: Risk stratification system according to the SFT results identify earlier and with greater accuracy diabetic patients with risk of developing DFU than according to the standard neurological test results. The results of this research clarify that is needed to include SFT in the risk classification system because when the standard test are used under-diagnosis for diabetic neuropathy is developed and under-stratification of risk is caused.

[P54] CHANGE IN FAT PAD COMPOSITION IN THE NEUROPATHIC DIABETIC FOOT AND IT'S ASSOCIATION WITH DYNAMIC PLANTAR FOOT PRESSURE

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Aim: Diabetic neuropathy is associated with physiological and biomechanical abnormalities in the foot that increase risk for ulceration. These include micro-haemorrhage, neuropathy-induced atrophy, and non-enzymatic glycosylation of proteins in the cushioning fat-pads of the foot. The objective was to assess if the composition of fat pad tissue changes in the neuropathic diabetic foot and is associated with increased repetitive stress on the foot during walking.

Method: Fourteen patients with diabetic neuropathy (mean age 57.9 years) and five age-matched healthy controls underwent T1-weighted sagittal plane spin-echo MRI of the rearfoot at 1.5 Tesla. Two-point Dixon Chemical Shift Imaging was used to create fat-only and water-only images from which the fat signal fraction in a defined ROI of the sub-calcaneal fat pad was calculated. The barefoot plantar pressure distribution during walking was measured using an Emed pressure platform and peak pressure in the heel region was calculated.

Results/Discussion: Mean ± SD fat signal fraction was significantly lower in patients (0.55 ± 0.11, range 0.34-0.67) than in healthy controls (0.72 ± 0.03, range 0.70-0.76, $p < 0.005$), and was explained more by a lowering in fat signal (R^2 0.87) than an increase in water signal (R^2 0.32). Mean ± SD peak dynamic pressure at the heel was 391 ± 119 kPa for patients and 325 ± 53 kPa for healthy controls (non-significant). Fat signal fraction and peak pressure were significantly inversely correlated ($r = -0.59$, $p < 0.01$).

Conclusion: Dixon MRI shows changes in sub-calcaneal fat pad composition in diabetic neuropathy, through a decrease in fat rather than an increase in water content. Both neuropathic and non-neuropathic factors may be attributed to this outcome, which include increased amounts of collagen as a result of non-enzymatic glycosylation or neuropathy-induced fat pad atrophy. As a result, fat pad function is compromised, as indicated by increased repetitive stress on the foot. These findings improve our understanding of the relationship between foot structure and function, and with that of the factors that underlie foot ulceration in diabetic neuropathy. Although plantar heel ulcers are not common, the associations found may act as a model for pathological changes that occur in the forefoot, where ulcers mostly occur.

[P55] COMPLETE WOUND HEALING IN A MONTH AND PERSISTING FOR 2 YEARS WITH THE USE OF AUTOLOGUS ADIPOCYTE TISSUE DERIVED - MESENCHYMAL STEM CELLS IN A NON-HEALING DIABETIC ULCER. A CASE PRESENTATION

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Aim: There is a demand for therapies to promote the efficient resolution of hard-to heal wounds with minimal appearance of scarring. Recent in vitro studies with Mesenchymal Stem Cells (MSCs) have identified numerous mechanisms by which these cells can promote the process of wound healing, and there is significant interest in the clinical translation of an MSC-based therapy to promote dermal regeneration. The aim of the present study was to investigate the efficacy of the adipocyte tissue derived-MSCs in a non-healing diabetic ulcer.

Method: Case presentation: A woman with Diabetes Mellitus (DM) type 1, aged 47 years old, with duration of DM 24 years, presented for first time two years ago, with a non-healing ulcer in the plantar surface of the right foot under the second metatarsal head. Osteomyelitis observed after the first visit of the patient in our outpatient clinic with Magnetic Resonance Imaging. The patient received treatment with antibiotics for six months and at the end of the treatment, the labelled white blood cells scan was normal. But, there was not evidence of closure of the ulcer for another six months, despite our efforts. So, we decided to apply autologus adipocyte tissue derived- MSCs to the site of the ulcer. A piece of about 60ml adipose tissue was collected by lipectomy performed by a surgeon from the abdominal subcutaneous area under local anesthesia. For the preparation of adipose tissue derived stromal vascular fraction (SVF) and the method of collagenase digestion was applied. The cells were then rate controlled frozen and stored in liquid nitrogen until use. Before application the cells were rapidly defrozen at 40°C washed twice with PBS, and resuspended in 2mL of the patient's serum. Injection of the MSCs in the ulcer site made in April 2013.

Results/Discussion: After a month of the MSCs injection there was complete closure of the ulcer with normal dermal appearance. No side effects observed during the follow up period. After 2 years of follow up there is still complete healing of the ulcer.

Conclusion: In conclusion, administration of autologus adipocyte tissue derived- Mesenchymal Stem Cells achieved complete healing of the diabetic refractory to other treatment ulcer. This intervention may be helpful for other same cases in future.

[P56] NEW POSSIBILITY TO EVALUATE BONE QUALITY IN FEMALE WITH DM2

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Aim: of our study was to evaluate bone quality during DXA with TBS to improve understanding the role of bone degraded in DF pathogenesis.

Method: It was cross-sectional study that involved 59 female with DM2 after menopause recruited in our endocrine department in 2015. The mean age was 62,3±6,6, duration of DM2 13,0±7,4, mean duration of menopause was 12,4±7,2 years. During ДХА we evaluated bone mineral density (BMD) in femur neck and lumbar spine. T-criteria and TBS were measured. FRAX algorithm used for 10-years risk of fracture estimation. The correlation with anthropometric, anamnesis parameters, FRAX and BMD was evaluated. For TBS interpretation we have taken recommendations of International European Group of TBS-users, in which TBS < 1,2 means degraded micro-architecture; TBS =1,2-1,35 – particularly degraded micro-architecture and TBS>1,35 – normal.

Results/Discussion: Osteoporosis (T-<2,5 SD) was revealed in 2 (3,4%) patients, osteopenia (-2.5<T<-1.0 SD) – in 22 (37,3%). The TBS in this group was 1,15±0,13. TBS less than 1.35 was in 41 (69,5%) patients. TBS less than 1,2 – in 22 (37,3%), in the interval 1,2-1,35 – in 17 (28,8%). It was revealed moderate negative correlation with FRAX for major osteoporotic fractures (r=-0,41), and with weight, height and BMI of patients (r=-0,43; -0,35;-0,39 respectively). Only weak correlation between DM2 and menopause duration and TBS have calculated (r = 0,24, r = -0,28). It was very low correlation between TBS and HbA1C (r=-0,18).

Conclusion: We have found that female with DM2 in menopause have changing of bone quality. We will planning to evaluate a bone quality using TBS in female with DF, especially with arthropathy Charcot.

[P57] RELATIONSHIP BETWEEN INFLAMMATORY MARKERS WITH CLINICAL AND HISTOLOGICAL PRESENTATION OF DIABETIC FOOT OSTEOMYELITIS

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Introduction: Diagnosis and prognosis of Diabetic Foot Osteomyelitis (DFO) is critical in order to chose the best treatment: surgical o antibiotic therapy. Heterogeneity in clinical presentation of DFO could delay the diagnosis and therefore an accurate management that could cause some complications

Aims: To analyses clinical presentation of DFO, changes on inflammatory markers and the results of histological and microbiological to develop diagnostic and therapeutic strategies to reduce complications in patients with DFO.

Method: A retrospective study involving 46 patients with clinical suspect of DFO. Mean age of patients was 59 years ± 10.50. 30 patients were male (65%) and 16 women (35%). 9 patients (19.6%) had type 1 diabetes mellitus (DM) and 37 patients (80.4%) type 2 DM. Duration time for diabetes was 14 ± 11.53 years. Average body mass index (BMI) was 27 ± 6.09 kg m2 and average HbA1c was 7.79 ± 2.2%. Suffering time from the ulcer was 10.50 ± 38.55 weeks. Analytical inflammatory markers as ESR, CRP and leukocytosis, clinical signs of infection were related with histological and clinical type of osteomyelitis.

Results: Probe to bone test was positive in 84% of patients had positive, 52.2% had absence of clinical signs of infection. Chronic osteomyelitis was associated with patients without ischemia and without clinical signs of infection (p=0.036). Patients with ischemia and clinical signs of infection are also related with fibrosis osteomyelitis. Not significant differences were found between inflammatory markers values and both histological and clinical classifications.

Conclusions: DFO was very heterogeneous and we did not found specific identification variables for each type. A deep analysis of clinical presentation, inflammatory marker and clinical test is mandatory in this patient for an accurate and early diagnosis.

[P58] ALBUMINURIA AS PREDICTIVE RISK FACTOR FOR FOOT ULCERATION IN PATIENTS WITH DIABETES MELLITUS

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Aim: Prevention of diabetic foot consists in screening for persons at risk of foot ulceration. While neuropathy and peripheral artery disease (PAD) are well-known ulceration risk factors, the association of albuminuria (Alb) with diabetic ulcer occurrence has not yet been clearly described. Although clinical tests to examine feet are simple, in reality this examination is often neglected due to various reasons and patients seek specialised clinic only when ulceration already develops. In the clinical practice a laboratory marker of foot ulceration risk would enhance identification of at-risk patients and enable more effective specialised care. The aim of this study was to examine the association of Alb with risk factors of foot ulceration – neuropathy and PAD in ulcer-naive patients with diabetes.

Method: In prospective study we included 87 consecutive ulcer-naive patients with diabetes (mean age 66.2 ys ±10.4, 70% men, 93% T2DM, mean diabetes duration 8,5 ys ±6.4, mean HbA1C 53 mmol/mol IFFC, 25% treated with insulin, 48% smokers, past or current) treated at our outpatient clinics which went through preventive foot examination at the foot clinic. Each patient filled a structured questionnaire focused at neuropathy symptoms, specialised nurse examined the feet for neuropathy (use of 10-g monofilament, biotheziometer), and ischaemia (ABI, pulsation of peripheral arteries), measured surface temperature of feet and assessed occurrence of foot deformities. The following clinical characteristics of the patients were obtained from the medical records (BMI, presence of retinopathy, Alb, level of creatinine, lipids, TSH). Neuropathy was defined as the loss of 10-g monofilament perception and/or reduced vibration perception threshold with a biotheziometer (> 25V). PAD was defined as the absence of at least one pedal pulse and/or ankle-brachial index below 0.9. Alb was defined as an albumin-to-creatinine ratio of >2.6 in men / >3.6 mg in women /mmol creatinine in a spot urine sample. The patients were divided into two groups according to presence of Alb: group 1 patients with normoalbuminuria (n=63), group 2 patients with Alb (n=24). Clinical characteristics of both groups of patients were statistically compared. The association of Alb and PAD and neuropathy was assessed both individually and in as combined risk (presence of neuropathy, or PAD, or both) using the Mann-Whitney and Fisher tests.

Results: Clinical characteristics of the patients in both groups did not show a significant difference except for BMI (p=0.037) with higher values in patients with Alb. 54.2% patients with albuminuria suffer PAD while only 22.2% patients with normoalbuminuria suffer PAD (p = 0.008). Neuropathy is present in 62.5% patients with albuminuria and 28.6% normoalbuminuria (p=0.006). Combined risk (presence of neuropathy, or PAD, or both) was proved in 83% patients with Alb while only in 41% (p=0.001) patients with normoalbuminuria. Specificity of Alb as screening test of PAD, neuropathy or combined risk is 82%, 83% and 90%, respectively.

Conclusion: We found a statistically significant association between Alb and risk factors of foot ulceration - neuropathy and PAD. Patients with albuminuria are at a relevant risk of foot ulceration thus clinical foot examination is urgent. Frequent foot checks, repeated education and long-term dispensarisation at specialised clinics are the mainstay of ulceration prevention for these patients.

[P59] USE OF A NEW ANTIBIOTIC BONE SUBSTITUTE TO INDUCE HEALING OF OSTEOMYELITIS IN THE DIABETIC FOOT

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Aim: Aim of this work was to evaluate the efficacy of a new antibiotic bone substitute, Calcium Sulphate Hemihydrate + Hydroxyapatite + Gentamicin Sulfate (CSH + HA + GS), in the treatment of osteomyelitis (OM) in diabetic foot.

Methods: From June 2013 to February 2016 we used a new CSH + HA + GS compound to fill resected bone voids following surgical intervention in cases of diabetic foot OM. The uniqueness of this product is that it induces native bone growth, while the synthetic bone disappears and antibiotic is released into the surrounding tissues, maintaining high gentamicin concentrations for some weeks.

In 24 patients, with (8, 33,3%) or without (16, 66,7%) Charcot neuroarthropathy and post-lesional osteomyelitis, after removal of infected bone we applied 10 to 20 ml CSH + HA + GS, filling the residual spaces and aiming to stabilize the remaining bone fragments. When needed, these arthrodeses were stabilized by external-internal hybrid fixators. X-ray evaluations and, when indicated, MRI evaluations were performed before and after surgical intervention, and 3 months post-op. Revascularization with percutaneous angioplasty was performed when needed (13/24, 54.1%).

24 patients affected by OM were treated, 4 of them having 1st metatarsal head involvement, 7 having heel involvement, 13 tarsal and hindfoot involvement. After surgical intervention all of them were treated with standard medication and pressure relief.

Results: The four 1st metatarsal OM cases healed (100%), both in regards to infection and lesions. One (14,3%) of the patients with heel OM presented with a worsening of the infection and was treated by major amputation, one patient (14,3%) died during early follow-up, due to cardiovascular causes; all the remaining five patients (71,4%) healed, one of them was presenting good soft tissue growth two months from the intervention, and in the absence of clinical signs of OM relapse, was treated with a sural fasciocutaneous pedicled flap. 9 (69,2%) of the 13 patients who had midfoot or hindfoot partial resections healed, one patient is still ongoing, 3 (23%) patients presented late OM relapse or lesions evolution, treated with minor amputations. The healed patients are all wearing suitable shoes.

Conclusion: The use of a new CSH + HA + GS bone substitute has shown to be efficacious in inducing OM healing and preserving foot structures in diabetic feet.

[P60] PLASMA LEVELS OF ASYMMETRIC DI METHYL ARGININE AND ENDOTHELIAL DYSFUNCTION IN DIABETIC SUBJECTS WITH NEUROPATHIC FOOT ULCER

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Aim: Evaluate the relationship between plasma Asymmetric–Di-Methyl-Arginine (p-ADMA) level and endothelial dysfunction (ED) in diabetic subjects with neuropathic foot ulcer (NFU), and study the possible predictors of p-ADMA level.

Method: 80 diabetic subjects of matched age, sex and BMI were included; 40 with NFU(G1), 20 with peripheral nerve dysfunction (PND) (G2) and 20 without PND (G3), plus 20 matched healthy subjects (G4). Subjects with renal or hepatic impairment, ischemic heart disease, smoking or using statins were excluded. Flow-mediated-dilatation (FMD) of brachial artery and Carotid-intima-media-thickness (CIMT) were measured using high-resolution ultrasound to evaluate ED and subclinical atherosclerosis, respectively. p-ADMA levels were assayed by ELISA kits supplied by EAGLE-BIOSCIENCES, INC (Germany).

Results/Discussion: G1&2 had a significantly lower FMD than G3&4 [-5.09(-22.5-22.92), 4.67(-15-23.91) vs. 15.74(8.33-36.59) and 20.1(10.0-46.15) %, respectively] (p< 0.001), and higher CIMT [0.9(0.6-1.5), 0.9(0.6-1.3) vs. 0.6(0.5-0.8) and 0.7(0.5-0.9) cm, respectively] (p<0.001). However, there was no significant change in p-ADMA between the study groups [704.5(508-3611), 687(286-2863), 678(506-874), 642(383-797) ng/L, respectively] (p=0.126). p-ADMA was positively correlated with diabetes duration, systolic blood-pressure, serum total cholesterol, triglycerides and CIMT (r=0.299, p=0.007, r=0.298, p=0.007, r=0.390, p< 0.001, r=0.237, p=0.034, r=0.330, p=0.003, respectively), with no significant correlation with FMD (r=-0.176, p=0.118). FMD was inversely and strongly related to CIMT (r=-0.520, p<0.001). p-ADMA levels were significantly higher in uncontrolled hypertensive patients in comparison to controlled and normotensive subjects (p=0.026). Metformin users and hypertensive subjects on ACEIs or ARBs had the lowest p-ADMA levels than the non users (p<0.001, p=0.007, respectively).

Conclusion: The remarkable ED in diabetic subjects with NFU is unlikely to be due to alteration in p-ADMA. Further studies are needed in order to conclude a causal association between p-ADMA and ED in this group of patients.

[P61] EXPRESSION OF DIFFERENT COLLAGEN TYPES IN DIABETIC FOOT ULCERS AND CHRONIC WOUNDS OF VARIOUS ETIOLOGY

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Aim: To evaluate the expression of collagen I, III and IV in diabetic foot ulcers of different etiology and non diabetic chronic wounds.

Materials: The 19 patients with nonhealing lower extremity chronic wounds were included. 6 samples were taken from diabetic foot ulcers (group 1), 9 patients had chronic diabetic foot postoperative wounds (group 2) and 4 samples were taken from chronic non diabetic ulcers (group 3).

Methods: Biopsies were performed from the margin and central part of the lesion. Immunohistochemistry was done with antibodies to collagen I, III and IV. Semiquantitative evaluation of immunohistochemical observation was made using score from 0 to 6.

Results: There was no difference in age and ulcer duration between groups. Collagen III expression showed significantly lower score in group 1 (0.33 vs 2.7 vs 3.0, p= 0.02). Collagen I was the same in all groups (1.3 vs 1.8 vs 2.0, p=0.50). Collagen IV was significantly lower in group 1 compared with group 2 (0.7 vs 2.2, p=0.44) but did not differed from group 3 (p=0.5). Groups 2 and 3 did not differ on the content of collagen I, III and IV.

Conclusion: Our findings demonstrate that diabetic foot patients with ulcers of various etiology differed in connective tissue formation. Chronic postoperative diabetic foot ulcers and nonhealing nondiabetic ulcers showed significantly higher collagen III expression which normally appears earlier and replaced by collagen I. Non postoperative diabetic foot ulcers are characterized by low content not only collagen III but also collagen IV which is responsible for the normal formation of vessels basal membrane.

[P62] ASSESSMENT OF MICROCIRCULATION IN THE FOOT OF PEOPLE WITH DIABETES WITH LASER SPECKLE CONTRAST IMAGING

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Aim: One of the greatest challenges in diabetic foot disease is estimating the impact of peripheral ischemia. Currently used non-invasive diagnostic techniques only provide rough indications. Laser Speckle Contrast Imaging (LSCI) is a promising non-invasive technique to assess microcirculation. The aim of our study was to investigate the stability, reproducibility and validity of LSCI for determination of microcirculation in the foot of people with diabetes.

Method: We performed a prospective cohort clinical study. Thirty-three patients with diabetes mellitus and a foot ulcer were included. Patients were, based to the current IWGDF classification of perfusion, divided in two groups: non-ischemic and ischemic. We performed LSCI scans of the dorsal and plantar side of the ulcerated foot and the contralateral foot. The microcirculation at baseline was determined and followed by two different occlusion tests. All scans were performed twice by the principal investigator and a third time by an experienced clinician. Furthermore, ankle blood pressure, ankle-brachial index (ABI), toe blood pressure and TcpO2 were measured in both feet.

Results/Discussion: The overall intra- and inter-observer agreement were both high and significant for the assessment of microcirculation at baseline and for the occlusion tests (intra-observer: ICC > 0.85; $p < 0.001$; inter-observer: ICC > 0.7; $p < 0.05$). The correlation between LSCI and ABI, toe pressure and TcpO2 was weak ($r < 0.5$). The microcirculation at baseline (measured with LSCI) was non-significantly lower in ischemic feet compared to non-ischemic feet (40.2 vs. 51.1; $p > 0.05$); microcirculation for the occlusion tests was significantly lower in ischemic feet (61.9 and 34.9 vs. 100.8 and 66.8; $p < 0.05$). The LSCI values of the microcirculation at baseline in the ulcerated foot were significantly higher compared to the contralateral foot (46.1 vs. 39.8; $p < 0.05$) and non-significantly higher during the occlusion tests (82.2 and 55.0 vs 74.4 and 49.1; $p > 0.05$).

Conclusion: LSCI is a stable, reproducible and valid technique for assessment of microcirculation in feet of people with diabetes, with low intra- and inter-observer variability. LSCI can be useful in the determination of peripheral ischemia in diabetic foot ulcers. Although more clinical studies are needed to determine the prognostic power of LSCI, the results of this study are a promising first step towards improved diagnostics among these patients.

[P63] IMPACT OF A DIABETIC FOOT ULCER: THE FAMILY'S POINT OF VIEW

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Aim: Several studies have already evaluated the Quality of Life (QoL) of patients with a diabetic foot ulcer (DFU). The objective of present study was to investigate the reported QoL of the patient's caregivers (partners and children).

Method: This was a prospective cohort study of patients presenting in a one-year period (2015) with a DFU, Wagner 2 or more, at the Antwerp University Hospital. QoL was assessed using the Diabetic Foot ulcer Scale (DFS) for patients; an adjusted version of this questionnaire was applied for the caregivers. Univariate analysis was used to see whether there was a relation between the QoL of the patient and the QoL of the caregivers. Participation was on a voluntary basis. This study was approved by the local ethics committee; written informed consent was obtained. Data were collected in an Excel database and processed using SPSS.

Results: 25 patients with DFU agreed to participate, as well as their caregivers. Mean age was 69,4 ± 10,1 years. Infection was present in 13 patients (52%), 16 patients had PAD (64%), 11 had neuropathy (44%), 15 had chronic renal insufficiency (60%). Ulcers were localized at the toes (n=11; 44%), forefoot (n=5; 20%), heel (n=7; 28%) or on other locations (n=2; 8%). Mean duration of the DFU was 7,98 +/- 1,44 months. Ulcers were classified according to Wagner as: grade 2 (n=14; 56%), grade 3 (n=8; 32%), grade 4 (n= 3; 12%).

Of these 25 patient, 13 had partners included in this study, 3 had their child included and 7 patients had both partner and child included. In total, 30 caregivers agreed to participate; 20 (66,7%) were partners and 10 (33,3%) were children of patients. Male:female ratio was 7:23.

The DFS questionnaire is divided into multiple subsets (Leisure, physical health, daily activities, emotions, non-compliance, family, friends, treatment, satisfaction, positive attitude and financial). Significant relations (p< 0,005) were shown between QoL of patients and their partners for the subsets 'satisfaction' and 'financial'. Low patient QoL in these subsets correlated with low partner QoL. No significant relations were found for other subsets.

Conclusion: A lot of research is done in the field of QoL in patients with a DFU. However, the impact of the DFU on the patient's relatives has not been studied extensively yet. Low QoL of patients correlates with low QoL of partners. Much more research is needed in this field.

[P64] IMPACT OF A DIABETIC FOOT ULCER: THE PATIENT'S POINT OF VIEW

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Aim: The objective of this study is to investigate the reported quality of life (QoL) of patients with a diabetic foot ulcer (DFU), and to evaluate which factors affect the QoL.

Method: This was a prospective cohort study of patients presenting in a one year period (2015) with a DFU, Wagner 2 or more, at the Antwerp University Hospital. QoL was assessed using the Diabetic Foot ulcer Scale (DFS). A number of medical data (peripheral arterial disease -PAD-, chronic renal insufficiency, neuropathy, metabolic control), sociodemographic context of the patients (age, habitation, social contact, level of education), as well as ulcer-related factors (location, duration, Wagner grade) were recorded. Multiple logistic regression analysis was used. Participation was on a voluntary base. This study was approved by the local ethics committee; written informed consent was obtained.

Results: Forty patients agreed to participate. Mean age was 69,8 ± 9,9 years. Female:male ratio was 7:33. Infection was present in 22 patients (51,2%), 28 patients had PAD (65,1%), 21 peripheral neuropathy (48,8%), 21 chronic renal insufficiency (48,8%). Ulcers were localized at the toes (n=19; 44,2%), forefoot (n=10; 23,3%), heel (n=8; 18,6%) or on other locations (n=3; 7,0%). Mean duration of the DFU was 8,9 +/- 1,8 months. Ulcers were classified according to the Wagner scale as: grade 2 (n= 23; 53,5 %), grade 3 (n=12; 27,9 %), grade 4 (n=5; 11,6 %). Worse metabolic control, and renal insufficiency had a negative influence on the QoL (p<0,05). On the other hand, presence of neuropathy showed an increase in QoL (p< 0,05). No effect of PAD was noted. A higher lever of education had a positive influence on QoL.

Conclusion: Etiological factors, comorbidities and sociodemographic factors can have a significant influence on the QoL of the patient. More research is needed in this area. One of the perspectives of this study is to include more patients and to provide follow-up.

[P65] ACELLULAR FISH SKIN GRAFT'S STRUCTURE AND BIOACTIVITY IS BETTER PRESERVED COMPARED TO MAMMALIAN DERIVED SCAFFOLDS DUE TO LESS HARSH PROCESSING

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Aim: Acellular fish skin grafts are remarkably similar to human skin in its basic structure. Yet the fish skin graft is fundamentally different from other mammalian derived scaffolds due to structural preservation and lipid preservation. While mammalian scaffolds require harsh chemical processing to reduce disease transmission risk (including viral and prion transmitted diseases), such risk from the Atlantic cod (Gadusmorhua) to humans is nonexistent. Therefore, fish skin graft is subjected to gentle processing that preserves its structure and its bioactive compounds, including omega-3 polyunsaturated fatty acids (PUFAs). Previous studies have shown that omega-3 fatty acids have anti-viral and anti-bacterial properties and also act as regulators of inflammation. Double blind randomized clinical trials have shown that acellular fish skin grafts promote significantly faster healing when compared to porcine small-intestinal derived scaffolds. A variety of other studies on the fish skin grafts, including acute wounds, oral wounds, burn wounds and dura replacement, have been performed with promising results. The acellular fish skin is currently being used in a regulatory approved and patented wound treatment product being marketed in the US and in Europe under the brand name Kerecis Omega3. We set out to evaluate the following biological properties in fish skin and mammalian derived scaffolds: micro-structure, bacterial barrier, hemostatic properties, omega-3 PUFA content and cellular infiltration.

Method: The scaffold structure was examined with scanning electron microscopy (SEM). NIH 3T3 fibroblasts were seeded onto a defined area of scaffold and cultured for 7-14 days. The scaffolds were stained with either hematoxylin and eosin (H&E) or fluorescent markers. Two chamber model was used to test bacterial barrier properties, with sterile broth in one of two chambers and broth with bacteria in the other. Effect on blood clotting was tested with the Lee White test. Lipids were extracted from the fish skin graft and omega-3 content examined with gas chromatography.

Results: Micro-structure of the fish skin grafts is highly porous, generally 10-100 µm in diameter while the micro structure of other biological scaffolds examined were denser and less porous. The acellular fish skin grafts possess superior ability to support three-dimensional ingrowth of cells when compared to human amnion/chorion membrane ($P<0.0001$). The material also acts as a barrier to bacterial invasion for over 48 hours in a two-chamber model at 37 °C. The fish skin graft had significantly faster aggregation effect compared to bovine pericardium collagen matrix ($p \leq 0.05$). The acellular fish skin graft contains EPA and DHA omega-3 fatty acids.

Results/Discussion: Micro-structure of the fish skin grafts is highly porous, generally 10-100 µm in diameter while the micro structure of other biological scaffolds examined were denser and less porous. The acellular fish skin grafts possess superior ability to support three-dimensional ingrowth of cells when compared to human amnion/chorion membrane ($P<0.0001$). The material also acts as a barrier to bacterial invasion for over 48 hours in a two-chamber model at 37 °C. The fish skin graft had significantly faster aggregation effect compared to bovine pericardium collagen matrix ($p \leq 0.05$). The acellular fish skin graft contains EPA and DHA omega-3 fatty acids.

Conclusion: The importance of the structural preservation in biological scaffolds was demonstrated with cell ingrowth studies. Based on these histologic findings fish skin derived graft showed significant ability to support three-dimensional cell infiltration compared to human amnion/chorion membrane. The native omega-3 PUFAs content of the fish skin graft might play a key role in its ability to resist bacterial invasion. These results also show that structural preservation and the biomechanical properties of the fish skin graft provides a supportive environment for cellular infiltration.

[P66] THE EFFECTIVENESS OF VAC-THERAPY IN PATIENTS WITH DIABETIC FOOT

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Aim: To evaluate the efficiency of topical negative pressure wound therapy (NPWT) compared with standard therapy for the regeneration of the soft tissues of the lower extremities in patients with diabetic foot syndrome.

Materials and methods: The effects of negative pressure therapy on the clinical (size, tissue oxygenation), histological (light microscopy) aspects of repair of the soft tissue of the lower extremities in patients with diabetes mellitus were compared with those of standard treatment. Forty-eight patients with diabetic foot syndrome were included in the study from the moment of debridement until the plastic closure wound. During the perioperative period, 28 patients (I groop) received NPWT (-75 to –120 mmHg) and 20 patients (II-control groop) received standard therapy.

Result: A reduction of the wound area (28.6%1±6.2%) and the depth of the defects (44.6±24.8%) were achieved with negative pressure therapy compared with baseline data. In the II group, the corresponding values were 23.6% 1±8.5% and 20.6%±20.4%, respectively. The result of transcutaneous oximetry showed a greater increase in the level of local hemodynamics in the study group ($p<0.04$). In the study group, 96% of patients had wounds filled with 88.2%±16% of abundant granulation tissue. The histological data of the I group show a significant reduction of oedema by 82%($p<0.05$), improved extracellular matrix organization ($p<0.05$), 90% ($p<0.05$) dissolution of inflammatory infiltrate and the formation of healthy granulation tissue ($p<0.05$).

Conclusion: The high efficiency of this method significantly reduced the time required for preparing the wound for the next surgical treatment.

[P67] VARIABLES ASSOCIATED TO THE IMPACT ON THE QUALITY OF LIFE OF RELATIVE CARERS OF PATIENTS WITH DIABETIC FOOT ULCER

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Aim: Identify variables related to the characteristics of relative carer of diabetic patients with DFU that impact the quality of life of the carer.

Method: Observational study, conducted at a Diabetic Foot Unit, which included 28 carers of patients with DFU. Barthel Index (1955) and Lawton and Brody (1969) were used to assess the level of dependency in basic and instrumental patient daily activities and the Questionnaire ICUB97© to identify the cares that the carer gives to its relative patient and consequences that this caring activity have in his quality of life (conceptual framework of Virginia Henderson).

Results/Discussion: Average age of the carer was 60,00±14,93 years and 67,86% (n=19) were woman. Average time carers have spent with their relatives was 81,82±124,15 months and 78,6% (n=22) lived together with the patients. Average patient level of dependency was moderated [(Barthel: 73,39±22,07), (Lawton and Brody: 3,96±2,22)]. Following table shows the distribution of the impact in the basic necessities of the carer and the carer characteristics that have impact on the carer life quality:

Impacted necessities according to the carer perception	n	%	Carer Variables associated to the basic necessities impacts
Oxygenation	4	14,3	----
Nutrition	13	46,4	College degree (p=0.003)
Elimination	8	28,6	Female (p=0.021)
Movement	18	64,3	----
Rest and sleep	18	64,3	----
Get dressed and undressed	2	7,1	Age (p=0.001), living with the patient (p=0.005)
Hygiene and protection of the skin	7	25	College degree (p=0.044)
Avoid dangers	15	53,3	Life together with the patient (p=0.003)
Communication	10	35,7	College degree (p=0.013)
Work and personal fulfillment	16	57,1	College degree (p=0.034), primary studies (p=0.030), work outside home (p=0.049)
Recreation	23	82,1	College degree (p=0.005), primary studies (p=0.047)
Learning	6	21,4	Patient total dependency (p=0.051)

Conclusion: DFU does not only affect the patient quality of life but also has a direct impact on their relative carers. The impact on the DFU patient carer is mainly focused in physical health (nutrition/elimination), psychological health (get dressed and undressed/hygiene and skin protection), everyday life (communication/recreation/learning) and professional life (work and personal fulfillment).

[P68] LONG-TERM RESULTS OF ENDOVASCULAR THERAPY IN DIABETIC PATIENTS WITH CRITICAL LIMB ISCHEMIA

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Objective: To evaluate the long-term results after peripheral angioplasty in diabetic patients with critical limb ischemia (CLI).

Methods: 81 diabetic patients with CLI underwent PTA in 88 limbs. There were 76(46%) men, with mean age 64,1[54-68] years, mean HbA1c 7,9±1,4%, mean duration of diabetes 16,5[0,8-43] years, diabetes type 1/2 - 8/73. Diagnosis and treatment of CLI based on recommendation of TASC II. The primary outcome was cumulative survival, secondary outcome were cases of repeat PTA and major amputations (MA).

Results: Patients were divided into 2 groups: group A (n-51) – with active follow up (FU) period (visits every 3-6 months during 5 years) and group B (n-30) - without active FU period (the second visit in our center was performed in 5 years after PTA). Only 44 (86%) patients from group A finished FU period. Patients from both groups were comparable in comorbidities, severity of lower limb artery obstruction's and degree of tissue damage (p<0,05): peripheral arterial disease (PAD) 4-6 classes according Graziani classification in both groups was in 75(93%) cases; Rutherford classification in both groups: 4 category-12(15%), 5 category in 43(53%), and 6 category in 29(31%) patients. Myocardial infarction and stroke in anamnesis were in 11 (15%) and 6 (8%) patients, respectively. Repeat PTA was performed in group A in 15 (35%), in group B in 5(16%) cases. There were major amputations in groups: A-4(9%) vs group B – 4(12%) (log-rank, p<0,05). Cumulative survival in groups: A-80%, in group B-67%. (log-rank, p<0,05).

Conclusion: CLI in diabetic patients is characterized by severe morphological lesions of the lower limbs arteries and soft tissue lesions. Active FU period have advantages in diabetic patients with CLI after PTA: timely performed reinterventions decrease the risk of major amputations and improve cumulative survival.

[P69] EFFICACY OF DIABETIC FOOT TEAM IN EARLY TREATMENT OF LIMB AND LIFE THREATENING DIABETIC FOOT INFECTIONS

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Aim: Validate the efficacy of early surgical and medical aggressive treatment of infected diabetic foot admitted in a diabetic foot clinic.
Patients: cohort of 254 patients hospitalized for diabetic foot infection from Jul. 1st 2014 to Dec. 31 2015. Mean Age 69 +/- 11.8y, M=197, F=57, ESRD=47.

Method: The severity of infection was defined using IWGDF/IDSA criteria as Grade 2-Mild (n=4,), Grade 3-Moderate(n=202),Grade 4-severe (n=48). All the patients underwent to DF surgery (n=254) emergent if severe, within 24h if moderate or mild with tendon involvement. Revascularization was performed if necessary (n=132). 86 patients underwent second or third surgical step A tissue specimen (n=254) have been collected in operating room for cultural exam after debulking or debridment. Empirical antibiotic therapy was started immediately, followed by specific antimicrobial therapy

Results:

	Mild n=4 (1,6%)	Moderate n=207 (79,5%)	Severe n=48 (48%%)
No amputation	2 (50)	48(23,2)	10 (20,8)
Toe amputation	2(50)	97(46,9)	14 (31,2)
Foot amputation		57(27,5)	16 (33,3)
Leg amputation		4(1,9)	7(14,6)
Death		1 (0,5)	1(2,1)

Only 47 patients have polimicrobial result after debridment and 207 only one germ isolated in the culture. MRSA (15.5%) is the more represented germ, 67.3% of stafilococcus aureus population and 45,2% of all the stafilococci populations. MRSA is mostly present in ESRD patients (80% of StafilococcusAu). Stafiloccical an MRSA infection does not correlate with the severity of infection or the amputation level. However Enterococcus fecalis (12,3%) correlate with severity of infection (P<0,1) and with higher levels of amputation (p>0,05). In revascularized patients leg amputation rate (1,5) is lower than general population. In ESRD patients legs (6,4) and foot (38,4) amputations rates are higher.

Conclusions: Performed by a team, early surgical debridment of moderate or severe foot infections followed by revascularization of ischemic ones can reduce amputations rates above the ankle. Correctly gathering for bacterial culture can reduce the rate of polymicrobial cultures and allow targeted antimicrobial treatment. Identification of microbial fauna of the population improve efficacy of empiric antibiotic treatment. In this population a high rate of MRSA have been observed, result of recurrent in non specific antibiotic treatments, however this germ don't affect the severity of infection as Enterococcus faecalis.

[P70] 6-YEAR RESULTS OF A DIABETIC FOOT UNIT: A TOE-FLOW MODEL

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Aim: In recent years, there has been a growing interest in multidisciplinary units to treating Diabetic Foot Disease. In 2009 our group created a unit based on the "toe and flow" model to treat these patients. We present the results of our Diabetic Foot Unit from November 2009 to September 2015.

Method: From November 2009 to September 2015 all diabetic patients with or without active ulcer were included. Along with physical examination, neuropathy and Charcot neuroarthropaty was assessed Vascular assessment was done by mean of ABI, $TcPO_2$ and Vascular Duplex scan. A biomechanical study was done in all patients. On the follow-up we evaluated the healing rate, location and depth of the ulcers, re-ulceration rate, limb salvage, and survival rate. Data are described in absolute and relative frequencies for qualitative variables and mean, standard deviation or quartiles for quantitative variables Method of Kaplan-Meier was used for the survival analysis. For statistical analysis package SPSS 15.0 for Windows was used.

Results/Discussion: 593 patients were included, with a mean age of 68.3±12.3 y, 71% of them were male, 58.8% were insulin-dependent and 42.5% had a bad metabolic control. 42,5% of them had had previous ulcers and 17,2% had a previous amputation. The median duration of diabetes was 14 years (IQR:7-24). On initial visit, 72.9% had neurologic impairment and 57,9% of the patients were classified as ischemic. We treated a total of 1244 ulcers in 597 limbs belonging to 432 patients. 58.4% of the ulcers were at digital level, 24,8% at metatarsal, 5.6% at midfoot and 11,3% at rearfoot. According to Texas classification, 8.9% were grade B, 49.4% grade C and 15,4%, grade D According to depth, 62.6% of ulcers were grade I, 20.6 % were grade II and 17.2 % grade III. A total of 1244 ulcers were treated, and wound healing was obtained in 78.8% of them, in 8.1 weeks on average. The major amputation rate was 7.5% with a limb salvage rate of 94%, 91% and 88% at 6, 12 and 36 months respectively. The mortality rate was 6.9 %, with a overall survival rate of 94%, 86% and 71% at 1, 3 and 5 years respectively. The re-ulceration rate was 30.8% (184 limbs) over the study period.

Conclusions: The results obtained in our Diabetic Foot Unit are comparable to those described in the literature, especially if we consider the higher number of ischemic patients with a high level of comorbidity. These results justify the creation of units based in the "toe and flow" model.

General information

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Conference venue

Maritim Hotel Stuttgart
Seidenstraße 34
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www.maritim.com/en/hotels/germany/hotel-stuttgart

Kultur- und Kongresszentrum Liederhalle
Berliner Platz 1-3
70174 Stuttgart
Germany
www.kongresszentrum-stuttgart.de

Disabled access

All areas of the venue allow disabled access.

Conference Secretariat (Registration desk)

The conference secretariat is located in front of Salon Köln-Bonn-Hamburg in Hotel Maritim.

Conference Hours

Friday 9th September

12:00 - 18:00	Registration
14:00 -18:00	Scientific sessions
14:00 -19:30	Exhibition
18:00 -19:30	Welcome reception (open to all delegates)

Saturday 10th September

07:00	Podartis diabetes run/walk
08:00 - 18:00	Registration
09:00 - 17:15	Scientific sessions
09:00 - 17:15	Exhibition
19:30 - 23:00	Conference dinner in Alte Reithalle. Included in the registration fee. Exhibitors can purchase a ticket at the registration desk.

Sunday 11th September

08:00 - 15:00	Registration
09:00 - 16:00	Scientific sessions
09:00 - 14:00	Exhibition
16:00 - 16:30	Closing Words and Farewell

Badges

All participants and exhibitors should wear the name badge in the conference area at all times. The badge must be visible.

Certificates of Attendance

Certificates of attendance will be available from Sunday 11 September, 10:30 at the registration desk.

Entitlements

Presenting authors
Accommodation in a single room (in 9 - out 11 September including breakfast), participation in all scientific sessions, programme and book of abstracts, coffee Friday, lunch and coffee Saturday and Sunday, participation in Welcome Reception Friday and Gala Dinner Saturday.

Non-pres. members
Accommodation in a single room (in 9 - out 11 September including breakfast), participation in all scientific sessions, programme and book of abstracts, coffee Friday, lunch and coffee Saturday and Sunday, participation in Welcome Reception Friday and Gala Dinner Saturday.

Non-members
Participation in all scientific sessions, programme and book of abstracts, coffee Friday, lunch and coffee Saturday and Sunday, participation in Welcome Reception Friday and Gala Dinner Saturday.

Accompanying persons
Participation in Welcome reception Friday and Gala Dinner Saturday. Accompanying persons do not have access to the scientific sessions and lunch is not included.

Exhibitors
Coffee Friday, lunch and coffee Saturday and Sunday is included in price. Exhibitors may participate in the Gala dinner Saturday for an extra fee, please contact the registration desk for details. Exhibitors do not have access to the scientific sessions.

Lunch and coffee

Lunch and coffee is available in the two exhibition areas. See programme for exact time of breaks.

Speaker Information

Please bring your presentation to the Schiller Saal before your session starts. We recommend you upload your presentation at least 2 Hours before our session. A technician will be present to assist in the upload if necessary.
Please bring your presentation on a USB. Use of personal laptops is not allowed.

Unless otherwise agreed all presentations will be deleted after the conference in order to secure that no copyright issues will arise at the end of the conference.

Mobile phones

All mobile phones must be on silent mode during the sessions.

Language

The language for the DFSG 2016 conference is English.

Lost and Found

Found items should be returned to the registration desk. If you lose something, please report to this desk for assistance.

No smoking policy

Smoking is prohibited in the venue. There are dedicated outdoor smoking areas available.

Posters

Posters can be mounted from Friday 9 September 2016, 12.00 and must be removed after the end of the poster session on Sunday 11 September 2016, 16.00.

The posters will be affixed to the poster boards with tape which will be provided to you by the conference staff.

Generel information

Prizes and Awards

Oral abstract prize
The 3 best oral abstracts will be presented on Saturday 10 September 2016.
These will be voted for and 1st prize for the best oral poster will be announced at the Gala Dinner Saturday evening.

Poster prize
1st and 2nd prize for the best posters will be announced at the Gala Dinner Saturday evening.

Life Time Achievement Award
The DFSG Life Time Achievement award will be announced at the gala dinner.

The Paul Wilson Brand Repetitive Stress Award
The prize is awarded to a presenter who has submitted an abstract to a regular DFSG meeting, presenting new clinical or experimental data on the effects of repetitive mechanical stress on soft tissues, joints or bones.
The winner of the prize will present his/her results in a session on Saturday 10th September.

First time presenter grant
Winners of the First time presenter grant will be announced at the gala dinner.

Social Events

Welcome reception
The welcome reception takes place on Friday 9th September 18:15-19:30 in the exhibition areas. Join your colleagues for snacks and wine/soft drinks. Included in the registration fee. Please note that the reception is not a dinner.

Morning diabetes run
Start the day by running or walking a route of 5 km. We meet in the entrance of Maritim Hotel. Map and water is provided.

Gala dinner
The Conference / gala dinner takes place in the Alte Reithalle (Old riding hall) with access from, Maritim Hotel,
Saturday 10th September 19.30 - 23.00.
We look forward to seeing you for a great evening with a 3 course dinner, music, entertainment and the announcement of prize winners. The conference dinner is included in the registration fee for participants.
Exhibitors may purchase a ticket by contacting the registration desk.

Closing words and farewell
We close the conference with a snack and drink in the lobby of Maritim Hotel on Sunday, 16.00. The event is open to all participants.

DFSG membership

Diabetologists, orthopaedic and vascular surgeons, podiatrists, specialist nurses and other medical specialists with an interest in caring for diabetic patients with foot problems form the main body of Members of the Diabetic Foot Study Group.

How does one become a member?

One must have an abstract accepted for oral or poster presentation at a DFSG Scientific Meeting. One must present this abstract in person, either as first author, or co-author at the same meeting.

Only after successful presentation can one apply to the DFSG secretariat, dfsg@dfsg.org or onsite at the conference to become a member of the DFSG.

- DFSG Members do not pay a yearly membership fee. They can register for DFSG Scientific Meeting at a reduced rate.
- DFSG Members are entitled to participate in the Scientific and Business Meetings of the Group, to vote and to elect the Executive Committee.
- DFSG Members have to attend at least one out of every three Scientific Meetings or else they forfeit their membership.
- Please note that membership of EASD does not mean automatic membership of DFSG.

Sponsor and exhibitor information

	**ABIGO Medical AB** Tel: +46 317 484 950 info@abigo.com www.abigo.com	Sorbact® ensures a trusted and simple effective way for prevention and control of infections in wound management. A Swedish innovation!
	**Biotec BetaGlucans AS** Tel: +47 776 489 00 info@biotec.no www.biotec.no	Biotec BetaGlucans develops and manufactures immune modulating compounds for the human health sectors, focusing on Woulgan® Bioactive Beta-Glucan Gel, a primary dressing for stalled wounds. Woulgan® promotes healing by activating white blood cells.
	**curasonix GmbH** Tel: +49 451 989 005 54 contact@curasonix.com www.curasonix.com	curasonix GmbH is dedicated to advanced wound cleaning through unparalleled ultrasonic technology for healthcare professionals combining decades of expertise and excellence in medicine and sciences.
	**Dermatonics Ltd** Tel: +44 148 046 2910 www.dermatonics.co.uk	Up to 80% of Neuropathic ulcerations occur on callus. You can prescribe Dermatonics Once Heel Balm with great certainty as evidence from double blind trials shows that 99% of users have all callus removed in 14 days, greatly reducing Ulceration risk.
	**Huntleigh** Tel: +44 292 048 5885 sales@huntleigh-diagnostics.co.uk www.huntleigh-diagnostics.com	Huntleigh "Assessment & Treatment" portfolio specialises in the Lymphoedema, Oedema and Wound Care fields, providing market leading products and clinical training to meet the needs for both clinicians and patients.
	**Kaneka Pharma Europe N.V.** Tel: +49 (0) 6196 – 96 797 - 26 sevinc.kahraman@kaneka.de www.kanekapharma.com	As a pioneer and innovator in emerging medical indications, we have developed or market highly sophisticated medical devices to support medical experts. SENSILASE-PAD-IQ, is an innovative laser technology for measuring microcirculation in patients with PAD or chronic wounds.
	**Kerecis** Tel: +354 562-2601 info@kerecis.com www.kerecis.com	Kerecis™ Omega3 Wound fish skin graft with natural omega3 polyunsaturated fatty acids accelerates wound healing and enables tissue reconstruction. Also from Kerecis, a dermatology range with patented mOmega3™ treating a number of skin conditions.
	**medac Gesellschaft für klinische Spezialpräparate mbH** Tel: +49 410 380 060 contact@medac.de www.medac.de	medac is a privately held pharmaceutical company with a growing pharmaceutical and diagnostics business. medac provides a range of high-quality speciality therapeutics like the well-established Urokinase medac in the field of vascular medicine.

	**OPED GmbH** Tel: +49 (0) 8024 / 60818-210 mail@oped.de www.oped.de	OPED – Keeps you going. We at OPED are experts in medical technology. We develop all our orthopedic rehabilitation products in-house and manufacture them in Germany. Our goal: A mobile patient.
	**Perimed AB** Tel: +46 858 011 990 mail@perimed-instruments.com www.perimed-instruments.com	PERIMED is a global provider of diagnostic solutions for patients with peripheral vascular diseases and complex diabetic foot ulcers. Our new PeriFlux 6000 offers a unique combination of tests: ABI, toe pressure and transcutaneous oximetry (tcpO2).
	**Podartis SRL** Tel: +39 042 329 31 italia@podartis.it www.podartis.it	Podartis has more than 20 years of experience and study on the foot diseases and ten years of experience and stable growth in the market. Podartis has a complete line of clinically and biomechanically tested products focused on the treatment of adult foot pathologies. The company also has a complete range of products for protected physical activity.
	**Söring GmbH – Ultrasonic-Assisted Wound Debridement (UAW)** Tel: +49 410 661 000 info@soering.com www.soering.com	Söring UAW ensures safe wound cleansing & biofilm removal without damaging healthy tissue, thus facilitating granulation & kick-starting healing of DFU. Sequential debridement with UAW can weaken bacterial ability to rebuild biofilms.
	**Tekscan, Inc.** Tel: +1 617 464 4500 info@marketing.com www.tekscan.com	Tekscan manufactures a range of pressure assessment tools. Our systems use thin, flexible, high-resolution sensors to observe gait abnormalities, determine orthotic efficacy, identify potential ulceration areas, screen diabetic patients, and more.
	**TRIGOcare International GmbH** Tel: +49 226 272 701 11 info@trigocare.com www.trigocare.com	Neuropad - Diagnostic Test for Sudomotor Dysfunction and Early Detection of Diabetic Foot Syndrome, Diabetic Neuropathy
	**Urgo Medical** Tel: +33 380 545 000 www.urgomedical.com	Urgo Medical is the subsidiary specialised in advanced wound care and compression of the French family-owned group URGO. Because we know the burden of wounds around the world, our mission is to provide patients with the best solutions to help them to heal and to restore their quality of life.
	**Woundcare Circle** Tel: +49 880 792 280 info@woundcare-circle.com www.woundcare-circle.com	3 professional partners - caring for foot ulcerations with a clinically approved therapy programme.

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