

The proinflammatory cytokines IL-6 and TNF- α fall significantly after 3 months of casting in patients with Charcot osteoarthropathy and severe bone and joint destruction

N Petrova¹, T Dew², R Musto², S Thompson², R Sherwood², C Moniz², M Edmonds¹

¹Diabetic Foot Clinic and Clinical Biochemistry, King's College Hospital, London, UK

Background and aims: Recently we have reported that the proinflammatory cytokines tumour necrosis factor alpha (hsTNF- α) and interleukin 6 (IL-6) are raised in patients with acute Charcot osteoarthropathy. However, it is not known what happens to these cytokines after the initiation of offloading. Thus the aim of this study was to measure prospectively high sensitivity TNF- α (hsTNF- α) and high sensitivity IL-6 (hsIL-6) in patients with recent onset of acute Charcot osteoarthropathy. **Material and methods:** We studied 34 patients with acute Charcot osteoarthropathy: 25 presenting with established x-ray changes (group 1) and 11 presenting with normal x-ray but abnormal technetium diphosphonate bone scan (group 2). We measured hsTNF- α and hs IL-6 at presentation, after 3 months of offloading with cast therapy and at the time of clinical resolution. **Results:** Age, gender, type and duration of diabetes and duration of casting therapy were similar between group 1 and group 2. At presentation, serum levels of hsIL-6 were significantly raised in group 1 compared with group 2 (8.4 ± 7.4 pg/ml versus 3.1 ± 4.2 pg/ml, $p=0.02$) but serum levels of hsTNF- α were not significantly raised (1.8 ± 1.0 pg/ml versus 1.3 ± 0.5 , $p=0.492$). On follow up, in group 1 hsIL-6 fell significantly from 8.4 ± 7.4 pg/ml to 4.0 ± 3.1 pg/ml ($p=0.006$) after 3 months of casting therapy. Also hsTNF- α fell from 1.8 ± 1.0 pg/ml to 1.4 ± 0.9 pg/ml ($p=0.002$). In contrast to group 1, in group 2 there was no significant reduction in the proinflammatory cytokines. Although hsIL-6 fell from 3.1 ± 4.2 pg/ml to 1.8 ± 1.0 pg/ml, this was not significant ($p=0.362$). Serum hsTNF- α remained unchanged from 1.3 ± 0.5 pg/ml at presentation to 1.4 ± 0.7 pg/ml after 3 months of casting treatment, $p=0.789$. Interestingly despite the ongoing casting treatment there was no further reduction in hsIL-6 and hsTNF- α after 3 months of casting until clinical resolution in group 1 and group 2. **Conclusions:** This study shows that the proinflammatory cytokines IL-6 and TNF- α fall significantly after 3 months of casting therapy in patients who present with Charcot foot with severe bone and joint destruction as seen on x-ray, but not in patients who present with normal x-ray.