

Foot Form in Children with and without Diabetes Mellitus Type 1

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Introduction: In April 2006 in Czech Republic was registered about 1 980 children with diabetes type 1 in age of 0 - 19. Which means that 4% of patients with DM type 1 were children. In the biomechanics laboratory at T. Bata University, an extensive measurement was conducted on the feet of diabetics type 2, during which it was determined that the diabetic feet are significantly wider in most cases in comparison with the feet of the healthy population at the same age, even up to two width. Proportional changes occur in foot dimensions, particularly among the older population. The aim of this study was to determine when changes in foot dimensions occur and whether these changes require a development of special shapes for the production of footwear for juvenile diabetics. **Methods:** The measurements were conducted in the Czech Republic. A total of 100 pairs of feet were measured on children with diabetes mellitus type 1 in the age from 5 to 14. For measurements was used 3D scanner PEDUS® Human Solutions GmbH (Germany) - non-contact device, which is equipped with three triangulation sensors. Prior to the measurement itself were determined the following characteristics: age, height, weight, health status of the foot as the health status of the skin and deformities, period with diabetes. Measuring values were evaluated by software ScanWorx 2.8.5 Sli. Comparisons were made of the measured values of measured group of children with diabetes mellitus type 1 and with the same sized group of healthy children (German) selected according to age, gender, body height and BMI from a database of 2 994 children. The following variables were compared: Ball girth, Ball length, Toe length and Arch Angle. **Results:** Period of diabetes mellitus: 0,5 - 13 years, average length of period with diabetes was 4,7 year. Skin condition: 20% of children have calluses, feet deformations: hallux valgus, flat-foot. Statistically significant differences were not found in comparative variables. **Conclusion:** No statistically significant differences were found between these two groups of subjects. These results suggest that it is not necessary to produce special footwear for juvenile diabetics. However it is necessary to continue research to determine the critical beginnings of foot changes. These changes, which induce serious complication, should not be underestimated.