ABSTRACT

The aim of this work was to create reference data, to determine the variability of rearfoot angle for the use in orthopaedic practice and to evaluate the age variations of rearfoot angle from 6 to 15 years. We further focused on the relationship between tibiofemoral angle, rearfoot angle, and height of the foot arch. Finally, we examined the dependence of tibiofemoral angle, rearfoot angle and foot arch on BMI and body height, both in absolute values and SD score.

We measured 120 healthy school children aged 6 to 14,99 years. Based on the chronological age the children were divided into three age categories: 6–8,99 years, 9–10,99 years and 11–14,99 years. The data were collected from March to November 2017 at three selected primary schools in Prague and Rudná, with the approval of the headquarters of those primary schools and of parents.

Methods included anthropometric measurement (height, sitting height, weight), making of static footprints of both feet on paper by a plantograph, and taking photographs of lower limbs to measure tibiofemoral angle and rearfoot angle. The foot arch height was calculated using the Chippaux-Šmiřák index. Anthropometric points for tibiofemoral angle and rearfoot angle were marked on probands with a thin marker and then measured by a protractor from photographs. Each photograph was taken under predefined, constant conditions.

The rearfoot angle did not change significantly from 6 to 15 years of age and it did not differ between boys and girls, neither in the whole file, nor in the three age cathegories. The mean rearfoot angle was 5.47° ± 3.44° for the right lower limb, 5.97° ± 3.81° for the left lower limb. We did not find clinically significant correlations between tibiofemoral angle, rearfoot angle and foot arch height. A statistically significant relationship with BMI was found only with left rearfoot angle of left foot arch height, however neither of them was clinically significant. As the body height (in SD score) increased, rearfoot angle decreased significantly.

Key words: tibiofemoral angle, rearfoot angle, podogram, foot arch, varosity, valgosity