

## Abstract

This diploma thesis deals primarily with the existence of the asymmetry of the bony pelvis and the sexual dimorphism of the asymmetry of the pelvic canal, which is caused by different reproductive functions of each of the sexes. Furthermore, the correlation or linear dependence of the external pelvic and pelvic canal dimensions was investigated.

The study uses 3D pelvic models created in Avizo 7.1 from CT images of the recent French population. The material consists of 74 probands, of which 36 are males and 38 are females. The models were digitalized using Viewbox 4 software, in which 29 landmarks were applied to each pelvic model. These correspond to 24 dimensions divided into three groups: the size of the non-canal pelvis, the dimensions of the pelvic canal and the dimensions for calculating the correlation between the non-canal pelvis and the pelvic canal.

The degree of asymmetry was evaluated using the formulas for the calculation of directorial (DA) and absolute (AA) asymmetry. Student's paired t-test was used for statistical analysis of asymmetry to determine asymmetry in previous studies. Gender differences were determined by the Mann-Whitney U test. At the same time, an analysis using the mixed model ANOVA was also performed, which in addition incorporates an intraobservation measurement error into the calculation, making the results more accurate. Pearson's correlation matrix was created to determine the linear dependence between external and internal pelvic dimensions.

In males, a higher degree of left-bias directional asymmetry of the non-canal pelvis was determined, the exception was iliac breadth, which showed right-bias asymmetry. The same DA pattern was detected for females, where moreover, right-bias asymmetry in the ischial lengths and in the acetabular height was determined. The female pelvic canal exhibited a statistically significant ( $P < 0.05$ ) left-bias in the inlet and midplane anterior, while outlet anterior displays right-bias. Significant differences in absolute asymmetry were found within women in the posterior part of the pelvic inlet and outlet. In males, a linear dependence between external and internal dimensions was determined for 58.33% of all dimensions, whereas for females it was 50%.