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SEX ESTIMATION FROM DIMENSIONS OF THE FOURTH LUMBAR VERTEBRA IN NORTHERN FINNS OF 20, 30, AND 46 YEARS OF AGE

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ABSTRACT

Background: Accurate sex estimation (sexing) is crucial for successful forensic identification. For the cases in which only a part of the skeleton or individual skeletal elements are available, we investigated the sex estimation potential of the fourth lumbar vertebra (L4) among 20-, 30-, and 46-year-old Northern Finns.

Material and methods: Magnetic resonance imaging scanned living subsamples of the Northern Finland Birth Cohort 1966 (scan at 46 years, n=1363) and the Northern Finland Birth Cohort 1986 (repeated scans at 20 and 30 years, n=375) provided the material for the study. After screening the scans for vertebral pathologies, we measured the maximum and minimum widths, depths, and heights of the L4 body. The mean vertebral width, depth and height were calculated together with vertebral cross-sectional area and volume. Sex estimations were performed using univariate and multivariate logistic regression analysis.

Results: We detected marked sex discrepancy in all the studied parameters of L4 ($p<0.001$). In the groups aged 20, 30, and 46 years, the regression models reached correct sex estimation rates of 86.4%, 87.7%, and 82.8%, respectively. At each time point, multivariate models proved more accurate than univariate models. Men showed consistently lower correct sex estimation rates than women.