H20 Effects of Age, Sex, and Height on Cortical Thickness of the Distal Femur: Ankara Specimen

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The goal of this presentation is to explore relationships of the thickness of the cortex of the distal femur of age, gender, and height in a cross-section of the Ankara population by Magnetic Resonance Imaging (MRI).

This presentation will impact the forensic science community by exploring dimorphism and information obtained using radiological methods which can help forensic research.

Criminals may destroy the remains of their victims to make their identification difficult.

Left and right knee MRI images from individuals without trauma-related fractures and mass lesions or deformities were collected between May 1, 2013, and July 25, 2013, at the Radiology Clinic of Ankara Numune Hospital. T1-weighted images were studied to take advantage of hyperintense signal in the bone marrow fat. On midcoronal section, medial and lateral cortical thickness measurements were obtained (8cm proximal of the median level of femoral lateral condyle.) On midsagittal section, anterior and posterior cortical thickness measurements were obtained (8cm proximal of the median level of femoral lateral condyle).

The group consisted of 68 subjects (34 male and 34 female). The mean age was 45.80 years (18-81 years), the mean body height was 169cm (150cm-200cm), the mean weight was 79.26kg (52kg-120kg), and the mean Body Mass Index (BMI) was 27.73 (18.20-39.06).

In terms of gender with right medial and posterior cortical thickness, about 67.6% of the subjects were correctly classified. From the four quadrants, strong correlations were observed in the right medial femoral cortical thickness with age ($r=0.349$; $p=0.004$) and thickness of the cortex of the left medial femoral with height ($r=-0,337$; $p=0.005$).

By digital radiological studies in with Maximum Vertical Diameter (VHD), Harma and Karakaş could correctly classify 77% of the Anatolian Caucasians and Mell and co-workers could classify 86.8% of the German subjects.[1,2] Literature on the femoral cortex regarding the relationship between age, sex, and height tries to explain the population variation.[3-5] Together, the existence of such dimorphism and information obtained using radiological methods can aid forensic research.

References:

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