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REGIONAL DIFFERENCES IN CORTICAL THICKNESS OF THE FEMORAL NECK IN CHIMPANZEES

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In order to consider the mechanical effects of daily locomotion on the femoral neck of chimpanzees (*Pan troglodytes*), we compared the cross-sectional morphology of the femoral neck of captive chimpanzees and wild chimpanzees. Femora from captive (specimens of Dokkyo University; n=8) and wild (lived in Mahale, Tanzania; n=4) were used for the study. We obtained femoral neck CT scans taken at the middle of neck, perpendicular to its long axis. Cortical geometry (thickness profile) was obtained by the measurements of every 1 degree around the circumference (360 points per section). Cortical geometry was compared by Principal Components Analysis between captive and wild chimpanzees. The cortical thickness of the inferior region was greater than the superior region in captive chimpanzees. On the other hand, cortical thickness of superior-anterior region was significantly greater than that of superior region in wild chimpanzees. Variation of the thickness was larger in wild chimpanzee than captive chimpanzees. These geometrical differences would reflect the modes of locomotion, that is, knuckle-walking on the ground dominates in captive, while various locomotor activities are employed, including arboreal vertical climbing in wild chimpanzees.

Keywords: femoral neck, cortical thickness, CT scan, Pan troglodytes