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Ontogeny and evolution of pelvic diameters in anthropoid primates and in *Australopithecus afarensis* (AL 288-1).

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Abstract

Pelvic diameters (both anteroposterior [AP] and transverse [TR]) were investigated in a series of anthropoid primates. The ratio of diameters (AP/TR) in each of three pelvic planes (inlet, midpelvis, and outlet) was calculated. In addition to the above, the length of the iliac, pubic, and ischial axes and the angles between these axes were determined. The AP/TR ratio at the pelvic inlet is (reported in millimeters, +/- SD, unless otherwise specified) 1.81 +/- 0.27 in New World monkeys (Cebidae) and *Macaca mulatta*; 1.53 +/- 0.17 in hylobatids and pongids; 0.87 +/- 0.08 in *Homo sapiens*; and 0.58 in *Australopithecus afarensis* (AL 288-1). The AP/TR ratio in the midpelvis is 1.61 +/- 0.23 in nonhominid primates (Cebidae, *M. mulatta*, hylobatids, and pongids), 1.12 +/- 0.11 in humans, and 0.59 in AL 288-1. In monkeys (Cebidae and *M. mulatta*), hylobatids, pongids, *H. sapiens*, and AL 288-1, the ratios of the length of the pubic axis over the ischial axis were 0.84 +/- 0.06, 0.95 +/- 0.07, 1.10 +/- 0.15, and 1.46, respectively; the pubis-ilium angles were 96 +/- 11, 120 +/- 10, 131 +/- 11, and 147 degrees, respectively; and the ischium-pubis angles were 106 +/- 11, 86 +/- 8, 96 +/- 7, and 68 degrees, respectively. In none of these pelvic features was AL 288-1 "intermediate" between pongids and *H. sapiens*. The anatomical peculiarities of the pelvis in AL 288-1 are explained primarily as the result of early adaptation to erect posture, which resulted in the reduction of the distance between the **sacroiliac joint** and the hip **joint**. As a consequence, the sacral promontory moved toward the pubic symphysis, and this resulted in shortening of the AP diameter and widening of the TR diameter at the pelvic inlet.

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