

Blood flow and blood volume in the femoral heads of healthy adults according to age: Measurement with positron emission tomography (PET)

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Objective: To deepen understanding of hemodynamics in the femoral head, i.e., the essential factor in clarifying pathogenesis of hip disorders, this study examined blood flow and blood volume in the femoral heads of healthy adults, and their changes with age, by using positron emission tomography (PET).

Methods: In 16 healthy adult males (age: 20–78 years old, mean age: 42 years), blood flow was measured by means of the H₂¹⁵O dynamic study method, and blood volume was measured by means of the ¹⁵O-labeled carbon monoxide bolus inhalation method.

Results: Blood flow was 1.68–6.47 ml/min/100 g (mean ± SD: 3.52 ± 1.2), and blood volume was 1.67–6.03 ml/100 g (mean ± SD: 3.00 ± 1.27). Blood flow significantly decreased ($p < 0.01$) with age, and blood volume significantly increased ($p < 0.05$).

Conclusion: PET was useful in the measurement of blood flow and blood volume in the femoral heads. With age, physiological hemodynamic changes also increased in femoral heads.

Key words: positron emission tomography, blood flow, blood volume, femoral head