

## Relationships Between Anthropometric Variables and the Internal Carotid Blood Flow

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### ABSTRACT

Assessment of peak systolic velocity (PSV) of the internal carotid artery (ICA) is utilized to examine stroke-symptomatic individuals for ICA stenosis. While a sedentary lifestyle is a common risk factor for ICA stenosis, a deeper understanding of how body composition affects ICA blood flow could provide insights before symptoms appear. **PURPOSE:** To examine the relationship between ICA blood flow and body composition variables. **METHODS:** ICA blood flow was assessed in eight healthy males ( $21.88 \pm 2.25$  years) on three different days to control for possible diurnal variability that could affect blood flow. Participants abstained from caffeine and physical activity for a minimum of 12 hours prior to each visit. Dual-energy X-ray absorptiometry was used to assess body fat percentage (BF%) and visceral fat area (VFA). Bioelectrical impedance (BIA) was used to assess body water percentage (BW%), metabolic age (MetA), and visceral fat rating (VFR). Participants rested supine with eyes closed for 5 minutes prior to assessment of ICA. B-mode doppler ultrasound sonography (7.5 MHz linear transducer) was used to measure PSV, end-diastolic velocity (EDV), resistance index (RI), and vessel diameter on the right ICA after 2 minutes of continual scanning with a 60° insonation angle. The relationship between ICA blood flow and body composition variables was examined via Pearson correlation analysis. **RESULTS:** BF% was positively correlated with ICA EDV ( $r = 0.669, p < 0.001$ ) and ICA PSV ( $r = 0.416, p = 0.043$ ) but negatively correlated with ICA diameter ( $r = -0.424, p = 0.039$ ). VFA was positively correlated with ICA EDV ( $r = 0.505, p = 0.012$ ). BW% was negatively correlated with ICA PSV ( $r = -0.417, p = 0.043$ ) and EDV ( $r = -0.620, p < 0.001$ ). MetA was positively correlated with ICA EDV ( $r = 0.630, p < 0.001$ ) but negatively correlated with ICA RI ( $r = -0.509, p = 0.011$ ) and diameter ( $r = -0.513, p = 0.010$ ). Similarly, VFR was positively correlated with ICA EDV ( $r = 0.644, p < 0.001$ ) but negatively correlated with ICA RI ( $r = -0.511, p = 0.011$ ) and diameter ( $r = -0.496, p = 0.014$ ). **CONCLUSION:** EDV has a greater correlation with body composition than PSV, suggesting that adiposity-related factors can describe ICA blood flow. Similarly, BIA might offer a solid and easy-to-attain procedure to indirectly assess ICA blood flow that warrants further research.