

## The Associations between Ankle and Brachial Systolic Blood Pressures with Obesity Parameters

**Authors :** Matei Tudor Berceanu, Hema Viswambharan, Kirti Kain, Chew Weng Cheng

**Abstract :** Background - Obesity parameters, particularly visceral obesity as measured by the waist-to-height ratio (WHtR), correlate with insulin resistance. The metabolic microvascular changes associated with insulin resistance causes increased peripheral arteriolar resistance primarily to the lower limb vessels. We hypothesize that ankle systolic blood pressures (SBPs) are more significantly associated with visceral obesity than brachial SBPs. Methods - 1098 adults enriched in south Asians or Europeans with diabetes (T2DM) were recruited from a primary care practice in West Yorkshire. Their medical histories, including T2DM and cardiovascular disease (CVD) status, were gathered from an electronic database. The brachial, dorsalis pedis, and posterior tibial SBPs were measured using a Doppler machine. Their body mass index (BMI) and WHtR were calculated after measuring their weight, height, and waist circumference. Linear regressions were performed between the 6 SBPs and both obesity parameters, after adjusting for covariates. Results - Generally, the left posterior tibial SBP ( $P=4.559 \times 10^{-15}$ ) and right posterior tibial SBP ( $P=1.114 \times 10^{-13}$ ) are the pressures most significantly associated with the BMI, as well as in south Asians ( $P < 0.001$ ) and Europeans ( $P < 0.001$ ) specifically. In South Asians, although the left ( $P=0.032$ ) and right brachial SBP ( $P=0.045$ ) were associated to the WHtR, the left posterior tibial SBP ( $P=0.023$ ) showed the strongest association. Conclusion - Regardless of ethnicity, ankle SBPs are more significantly associated with generalized obesity than brachial SBPs, suggesting their screening potential for screening for early detection of T2DM and CVD. A combination of ankle SBPs with WHtR is proposed in south Asians.

**Keywords :** ankle blood pressures, body mass index, insulin resistance, waist-to-height-ratio

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