Blood Pressure, Body-Mass Index and Vascular Mortality in 331,000 Indian Non-Smokers: The Chennai Prospective Study

S. Lewington[1] , V. Gajalakshmi*[2], B. Lacey[1] , P. Sherliker[1] , K. Vendhan[2] , R. Peto[1]

[1] Nuffield Department of Population Health, University of Oxford, Oxford, United Kingdom, [2] Epidemiological Research Centre, Chennai, India

Introduction: Although systolic blood pressure (SBP) and body-mass index (BMI) are major determinants of mortality in many Western populations, their relevance in leaner populations is uncertain.

Objectives: To determine the joint relevance of SBP and BMI in a lean population in South India.

Methods: A prospective study of cause-specific mortality at ages 35-69 in 331,039 nonusers of tobacco in urban South India. Analyses use Cox regression, stratified for age, sex, socio-economic status and years of education, and are corrected for regression dilution.

Results: Among 142,395 male and 188,644 female non-users of tobacco with no history at baseline of tuberculosis, asthma, emphysema, cancer, stroke or heart disease, there were 23,582 deaths at ages 35-69, including 9807 from ischemic heart disease and 1629 from stroke during an average 9 years of follow-up. Blood pressure was strongly related to mortality from ischemic heart disease (risk ratio per 20 mm Hg usual SBP [RR]=1.7, 95%CI 1.6-1.8) and stroke (2.4, 2.1-2.7). In this lean population (mean BMI, 23.4 [SD 3.9] kg/m^2), BMI was not associated with vascular mortality throughout the entire range from 15-30 kg/m^2, despite increased BMI being a strong determinant of increased SBP (8.5 [SE 0.07] mmHg per 10 kg/ m^2 BMI). Hence, the relationship of BMI to vascular mortality became strongly inverse on adjustment for SBP. Similar patterns were observed for waist circumference (men only).

Conclusion: Although blood pressure is a strong determinant of vascular mortality, and BMI is a strong determinant of blood pressure, in populations where there is little central adiposity and the variation in BMI is driven mainly by the variation in lean body mass, BMI is an inverse determinant of risk, and low BMI (given blood pressure) is hazardous.

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