

TUBERCULOSIS AND NUTRITIONAL STATUS IN TRANSITIONAL COMMUNITIES

Chulanee Jongkaewwattana¹, Samuel G. Schumacher¹, Karine Zevallos², Mathew Baldwin², Alejandro Necochea², Rosario Montoya², Robert H. Gilman³, Carlton A. Evans⁴

¹Universidad Peruana Cayetano Heredia, Lima, Peru, ²Asociación Benefica Prisma, Lima, Peru, ³Johns Hopkins Bloomberg School of Hygiene and Public Health, Baltimore, MD, United States, ⁴Wellcome Centre for Clinical Tropical Medicine Imperial College, London, United Kingdom

Tuberculosis (TB) is associated with wasting and was traditionally called 'consumption'. However, little is known about the interaction between TB and the epidemic of obesity in transitional societies, where TB is particularly common. We, therefore, studied the association between anthropometric measures and TB disease in transitional shantytown communities with high TB incidence. 3,123 adult (>17 years) participants were recruited continuously over a six-year period in 16 adjacent Peruvian shantytowns where the average daily income was <\$1US/day. Weight and height were measured in three cohorts: TB patients (n=898), 'TB-suspects' who had symptoms suggestive of TB but whose TB tests were negative (n=83) and healthy controls (n=2,142). TB patients had lower body mass index (BMI) than TB-suspects who had lower BMI than controls (both $p < 0.001$). Mean (standard deviation) BMI was 21.8 (3.1) kg/m² for patients, 24.1 (4.6) kg/m² for TB-suspects and 25.7 (4.4) kg/m² for controls. However, 16% of patients were overweight (BMI > 25 kg/m²) and only 29% of TB patients were underweight (< 20 kg/m²). In contrast, 67% of controls were overweight ($p < 0.0001$) and only 9% of controls were underweight ($P < 0.0001$). There was a strong association between increasing height and TB disease ($p < 0.001$). Mean (standard deviation) height was 158 (8.8) cm for patients, 157 (9.2) cm for TB-suspects and 156 (8.5) cm for controls. In multiple regression analysis adjusting for age (odds ratio [OR] 1.002 95% confidence intervals [CI] 0.99-1.01), male gender (OR 2.06 95%CI 1.61-2.63) and weight (OR 0.89 95%CI 0.88-0.90), increased height was associated with significantly greater odds of TB disease ($p < 0.001$; odds ratio 1.07 95%CI 1.05-1.09 per cm increase in height). In conclusion, in these transitional peri-urban shantytowns, there was a strong independent association between increased height and TB disease. A significant minority of TB patients were overweight, despite the overall association between low bodyweight and TB.