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Complex impact of urban living on the effect of cardiometabolic syndrome on the incidence of myocardial infarction

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Introduction: Cardiometabolic syndrome (CMS) is a significant public health issue which puts a person at a higher risk of stroke, heart failure, and peripheral vascular disease. Urban living poses unique challenges by increasing allosteric load from chronic stress. The specific effect of urban living on the relationship of CMS and cardiovascular disease has not been investigated. In this retrospective cross-sectional analysis we investigated the effect of living environment on CMS and myocardial infarction (MI).

Methods: The 2013 Behavior Risk Factor Surveillance System (BRFSS) survey, the largest population-based survey in the country, is an annual survey done on the non-institutionalized population of the United States by the Center for Disease Control and Prevention and National Center for Health Statistics. All patients from this nationally representative study were 18 years and older. Components of CMS included hypercholesterolemia, obesity, angina (as a substitute for decreased high-density lipoprotein), diabetes, and hypertension. CMS was identified as the presence of ≥3 CMS components. Comparisons were performed using complex samples logistic regression to determine the relationship of urban residence and effect of CMS on MI. All missing variables were excluded.

Results: Data on geographic locale of residence was available for 355,073 individuals (43.3% males & 56.7% females) and was representative of 130,445,908 individuals. Approximately 70.0% of these respondents were U.S. adults living in urban locales. The prevalence of MI among the urban population was 7.3% in American Indians/Alaska Native, followed by Non-Hispanic Whites (5.9%), Non-Hispanic Blacks (5.7%), and Hispanics (3.9%). The overall unadjusted odds ratio for CMS to non-CMS was 6.18 (95% confidence interval [CI], 5.81-6.58, $p < 0.001$). The adjusted OR was elevated, 5.26 (CI 3.37-8.21, $p < 0.001$), among urban dwellers but much less (3.75 CI 2.39-5.88, $p < 0.001$) among rural dwellers after the results were controlled for medical (e.g. smoking status) risk factors and demographic (education level, emotional support, age, and lack of health insurance) risk factors.

Discussion: There is a significant relationship between CMS and MI occurrence. However, when stratified by area of residence, urban dwellers have a much stronger relationship between CMS and occurrence of MI rather than rural dwellers. More longitudinal studies need to be done to create a more objective test in determining the level of chronic stress due to potential allosteric load and how this has an impact on chronic health. Health care professionals should be made aware of the potential effect of allostatic load from chronic stress on cardiovascular disease.

Biography

Srikanta Banerjee, M.D., MPH is a faculty member at the University of Roehampton School of Health Sciences. He received his M.D., MPH, and postdoctoral trainings in USA, the UK, and the Caribbean. He received additional training at the Centers for Disease Control and Prevention in public health and microbiology. His research activities cover cardiovascular disease, diabetes, chronic kidney disease, community health, and biostatistics.

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