Abstract

Cardiovascular disease is now a leading cause of death globally. However, metabolic syndrome is an extremely critical healthcare issue worldwide due to progressive increase in obesity and its related factors. Obesity is strongly associated with insulin resistance and other components of metabolic syndrome. There is discrepancy in the use of parameters for the diagnostic criteria of metabolic syndrome due to genetic and environmental variability in different ethnicity. Body mass index and waist circumference (WC) are commonly used in the assessment of central obesity and abdominal obesity respectively. Fahed et al observed that waist circumference was employed because measurement was easy, however, waist circumference alone is inconclusive of abdominal adiposity and must be interpreted with body mass index. The two measurements (WC and BMI) have been documented to be strongly related to insulin resistance. (Fahed *et al*., 2022). However, there is controversial assessment of metabolic syndrome using either waist circumference (WC) or body mass index (BMI) or waist hip ratio (WHR) or combination of two measurements (Kassi *et al*., 2011; Fahed *et al*., 2022). Our study assessed the prevalence of metabolic syndrome among apparently healthy 1516 participants from African ancestry using seven established diagnostic criteria (NCEP-ATPIII- National Cholesterol Education Program Adult Treatment Panel III, WHO- World Health Organization, IDF-International Diabetes Federation, AHA/NHLBI- American Heart Association/National Heart, Lung and Blood Institute, EGIR - European Group for the study of Insulin Resistance, AACE- American Association of Clinical Endocrinology). The result revealed highest prevalence of metabolic syndrome when modified NCEP-ATPIII [National Cholesterol Education Program Adult Treatment Panel III (ATP III)] was considered. The predictive assessment of blood pressure and arterial stiffness may be useful in achieving early detection and prevention of target organ damage. This study further compared clinic blood

pressure, ambulatory blood pressure and central pressure using conventional blood pressure monitor, Spacelabs 90207 (Spacelabs Inc., Redmond, Washington, USA) and applanation tonometry Sphygmocor device respectively. The findings revealed that central blood pressure and ambulatory blood pressure are more predictive of cardiovascular events among people of African ancestry. Our findings are pointers to cardiovascular risk in the study population. Additionally, this study provides new insights to the role of obesity in the perturbation of left ventricular geometry of people of African ancestry with metabolic syndrome; using quantitative and comprehensive evaluation of biochemical and echocardiographic profile.

Aldosterone produced locally in adipose tissue, heart, kidney and vasculature increase the expression of cytokines and other fibrotic factors. Thus, role of the local renin angiotensin aldosterone system (RAAS) in the pathophysiology of atherosclerosis and cardio-renal fibrosis was evaluated in animal study. With high prevalence of metabolic syndrome and obesity in Africans, elevated aldosterone from diet may likely predispose African community to diastolic dysfunction; this may be a pointer to increased incidence of heart failure in groups of African ancestry. Hence, this study lends insights into the potential role of TRPM7; a novel non selective cation channel and chanzyme in aldosterone-induced cardiovascular fibrosis. This study concluded that modified NCEP-ATPIII has suitable components for the diagnosis of MS in people of African ancestry. Metabolic syndrome in people of African ancestry is strongly associated with factors such as sex, smoking and alcohol. Consequently, MS and other risk factors such as obesity, aldosterone and insulin resistance may lead to left diastolic dysfunction among individuals with MS. Experimentally, aldosterone-salt induced cardio-renal fibrosis, aggravated by TRPM7 might be the underlying pathogenesis of MS and its cardiovascular complications in Africans; thus suggests TRMP7 inhibitors has potential anti-fibrotic agents.