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Review Paper

Prevalence of cardio-metabolic syndrome in Nigeria: a systematic review

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ABSTRACT

Objective: This is a systematic review of the distribution of cardiometabolic syndrome (CMS) in Nigeria, the clinical definitions widely used and how it affects the proposition of a national prevalence of CMS that will advise management interventions.
Study design: Systematic review of literature.
Methods: To present a comprehensive report of the distribution of CMS in Nigeria, extensive searches was carried out on PubMed, African Journals Online (AJOL), SCOPUS, EBSCOhost (CINAHL Plus), Google Scholar and Science Direct using terms: Nigeria, metabolic syndrome, cardio-metabolic syndrome, syndrome X, World Health Organization, International Diabetic Federation, National Cholesterol Education Program Adult Treatment Panel III, European Group for study on Insulin Resistance, American Association of Clinical Endocrinologist, American Heart Association/National Heart, Lung and Blood Institute. All published data between January 2002 and December 2013 were collated into a database. Information gathered and recorded for each source were the population sampled, age and number of population, locality, clinical definition used, longitude and latitude, and period of the study.
Results: Out of 32 studies, 9 (28.1%) adopted the WHO classification, 19 (59.4%) used the ATPIII definition, while the remaining 10 (31.3%) studies used the IDF definitions. Twenty (62.5%) were hospital-based studies on diabetic, hypertensive, HIV, asthmatic and thyroid disorder patients. The remaining 12 (37.5%) studies were population-based studies in urban, suburb and rural settings. The mean overall prevalence of CMS in Nigeria is 31.7%, 27.9% and 28.1% according to the WHO, ATPIII and IDF definitions, respectively. Most of the studies were from the Southern region. Age groups mostly studied were those from ≥35 years.
Conclusion: The report of this review provides an essential overview on the current distribution of CMS in Nigeria. It provides an insight to direct future studies such as the need to (1) study rural communities where lifestyles are not westernized as in the urban areas, and

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(2) young adults, as well as (3) develop a consensus on the definition of CMS among the Sub-Saharan African populations.

Introduction

Cardiometabolic syndrome (CMS) is a complex cluster of risk factors for cardiovascular disease (CVD) and diabetes.[1] Independent risk factors implicated in both clinical and public health perspectives includes hyperglycaemia, dyslipidaemia, hypertension and obesity. Individuals with the CMS are at increased risk of developing diabetes mellitus and CVD as well as increased mortality from CVD and all causes.[2] The CMS is believed to affect at least one in five adults worldwide and carries a high risk of CVD.[3] However, the actual prevalence in rural communities of Nigeria, as an example of low-mid income country (LIMC), need to be reviewed for the purpose of public health planning.

The mechanism underlying the relationship between CMS and CVD lies between the concept of endothelial injury and dysfunction; the deposition of low density lipoprotein cholesterol; and the recruitment, migration and proliferation of monocytes in smooth muscle cells in the artery wall. These are central to the initiation and progression of artherosclerosis.[4,5]

CMS was first mentioned by Gerald Reaven as Syndrome X or the Insulin Resistance Syndrome.[6] Following Reaven in 1988, several clinical definitions have been proposed: the World Health Organization definition (WHO),[7] the European Group for Study of Insulin Resistance, the National Cholesterol Education program – Third Adult Treatment Panel (NCEP ATP-III),[8] the American Association of Clinical Endocrinologists (AACE), the International Diabetes Federation (IDF),[9] and the American Heart Association/National Heart, Lung and Blood Institute (AHA/NHLBI) definitions.[10] This has led to some confusion on the part of clinicians regarding how to identify patients with the syndrome.[1] In order to salvage the situation, IDF and AHA/NHLBI representatives held discussion to attempt to resolve the remaining differences between definitions of CMS, which led to the recent consensus on harmonizing the definition of CMS.[1] It would be interesting to know how this is utilized in the developing parts of Sub-Saharan Africa and other LIMC health systems.

These individual risk factors have been reported in Nigeria.[11–15] However, despite the increase in reporting, the prevalence of CMS has not been clearly defined partly due to unresolved clinical definitions and resource constraints. Nigeria is currently undergoing rapid epidemiological transition to increasing number of metabolic disorders,[16] and some authors have implicated demographic changes such as ageing, and the undesirable risk factors such as obesity and sedentary life as the cause.[17–20] Based on the rising reporting of the prevalence of CMS in Nigeria over the last decade, the objective of this study is to assess overall distribution of CMS in Nigeria and the clinical definitions employed; as well as age group of the population covered in studies.

Methods

Study design

This is a systematic review of prevalence studies of CMS in Nigeria following the PRISMA guideline (S1). Two reviewers, VMO and EUN, extracted data independently using standardized data extraction forms. Consensus was reached between the reviewers in case of initial disagreement. Characteristics of studies extracted were the study location, type of population, number of population, age, and clinical definition of CMS used.

Study area

Nigeria is a Federation made up of 36 States and a Federal Capital Territory (FCT), Abuja; with 774 Local Government Areas. The states are grouped into six geo-political zones; namely the North Central, North East, North West, South East, South–South and South West.[21] The main latitude and longitude of Nigeria is 10° North and 8° East respectively.[22] Nigeria is approximately 923,768 sq km, located in West Africa with a population of 175.6 million people. Estimated 50.4% of this population live in the rural areas, while the remaining 49.6% live in the urban areas.[23]

Data sources and searches

A systematic collation of published data over the period of January 2002 to December 2013 on CMS was retrieved between August and December 2013 to develop a comprehensive distribution of CMS in Nigeria. A final search was done in January 2015. The search was carried out using electronic searches in online bibliographic archives: PubMed, African Journals Online (AJOL), SCOPUS, EBSCOhost (CINAHL Plus), Google Scholar and Science Direct. Search terms include: Nigeria, metabolic syndrome, cardio-metabolic syndrome, syndrome X, World Health Organization, International Diabetic Federation, National Cholesterol Education Program Adult Treatment Panel III, European Group for study on Insulin Resistance, American Association of Clinical Endocrinologist, American Heart Association/National Heart, Lung and Blood Institute were used. Many articles were identified through this method. Articles that could not be obtained online were sourced from the Library of Charles Darwin University. Suggested academics, experts and researchers that have published widely in the subject area in Nigeria were also contacted with request for other publications not indexed in any of the search database as well as other grey literature.