ABSTRACT

BACKGROUND

Insulin resistance is a risk factor for type 2 diabetes mellitus (T2DM) and cardiovascular disease (CVD), and its identification using simple clinical parameters will help prevent type 2 diabetes mellitus and cardiovascular disease. The International Diabetes Federation (IDF) recently proposed that the waist circumference should serve as a major and compulsory criterion for the diagnosis of the metabolic syndrome but there is paucity of data on cut-off levels of anthropometric indices of obesity among Nigerians, and most of the studies conducted in Nigeria made use of the Caucasian values.

OBJECTIVES

The purpose of this study was to determine the relationship between the indices of obesity and insulin resistance in South Western Nigeria, and their cut-off values for identifying insulin resistance.
SUBJECTS, MATERIALS AND METHODS

A cross-sectional community survey was carried out in Sagamu, Sagamu local government (urban community), and Isara/Ode-Remo, Remo–North local government area (rural community). Demographic and clinical information of the subjects were obtained. The blood pressure, height, weight, waist and hip circumferences were measured. Fasting plasma glucose and insulin were also determined. One hundred subjects (50 from each community) were evaluated for insulin resistance using the homeostatic model (HOMA). The interrelationship between the anthropometric indices, and the anthropometric cut-off values for identifying insulin resistance among the subjects studied were determined. Three hundred and thirty five subjects were evaluated for the metabolic syndrome using the new International Diabetes Federation criteria for the definition of the metabolic syndrome.

RESULTS
Nine hundred and sixty two healthy subjects consisting of 253 males, mean age 42.42±13.21 years and 277 females, mean age 43.95±15.36 years from Sagamu in Sagamu local government (urban community), and 215 males, mean age 38.40±13.95 years and 217 females, mean age 50.77±78 years from Isara/Ode-Remo in Remo–North local government area (rural community) were screened. The optimal cut-off values of waist circumference, waist-to-hip ratio and body mass index for identifying male subjects with insulin resistance are 83.7cm, 0.90, and 23.5kg/m² respectively. The corresponding values for the female subjects are 79cm, 0.88, and 23.8kg/ m² respectively. There was a significant correlation among the three indices of obesity evaluated, but of the two indices of central obesity, waist circumference correlated more with body mass index (r=0.717, p<0.001) than the waist-to- hip ratio (r=0.392, p<0.001). The percentage of subjects with insulin resistance was greater in the urban than in the rural community (64% vs 2%, p<0.01). In the urban community, there were positive but weak correlations between insulin resistance and anthropometric indices (p>0.05), but the correlation was best with waist circumference (r=0.181, p= >0.05). There was no
positive correlation between insulin resistance and anthropometric indices in the rural community.

CONCLUSION

The three indices of obesity studied correlated with insulin resistance, and with one another, but waist circumference correlated best with insulin resistance and with other indices. For public health and clinical use, lower waist circumference and body mass index cut-off values than recommended by the World Health Organization and the International Diabetes Federation would be more appropriate to define obesity in South Western Nigeria.