SUMMARY

Background:
Obesity is becoming a global epidemic and the prevalence is increasing not only in the developed countries but also in developing countries like Nigeria. The adverse consequences are cardiovascular diseases, type 2 diabetes and several cancers, which potentially increase the morbidity and mortality associated with the condition.

One of the cardiovascular consequences of obesity is left ventricular hypertrophy (LVH), which is an independent risk factor for stroke, myocardial infarction and sudden death. The presence of obesity further worsens the risk of developing these life threatening conditions. It is therefore necessary to know to what extent obesity is responsible for the development of LVH and what measures of obesity are implicated.

Aims and objectives
The aim of the study was to determine the relationship between the measures of obesity and echocardiographic determinants of left ventricular hypertrophy in adults seen at the University of Port Harcourt Teaching Hospital.

Methodology
A total number of two hundred and thirty (230) subjects were recruited for the study. One hundred and fifty (150) were obese while eighty (80) were non obese controls. Anthropometric data including weight, height, waist circumference and hip circumference were taken from all the subjects and Body Mass Index and Waist Hip Ratio calculated. Based on BMI the subjects were classified as obese and non obese.
Blood pressure measurement on at least two occasions and fasting plasma glucose estimation was done to identify, normotensive, normoglycemic subjects who were included in the study. Echocardiography was done in all subjects after physical examination. LV mass was calculated using the Devereux modified ASE cube formula and this was indexed to height$^2$ and to body surface area (BSA). The relative wall thickness and the presence or absence of echo LVH was used to identify the geometric patterns.

**Results**

- BMI and WC were strongly correlated to all the echo parameters with BMI having the strongest correlation with LVM/H$^2$ ($r = 0.708$, $p < 0.001$) in males and ($r = 0.799$, $p < 0.001$) in females. WHR was weakly correlated to LVM/H$^2$.
- The LV geometric pattern in the obese group was as follows: 16.7% had normal geometry, 12.6% had concentric remodeling, 46.0% had eccentric hypertrophy and 24.7% had concentric hypertrophy.
- Echo LVH was diagnosed in 70.3% of obese by LVM/H$^2$ criterion and 45.4% of obese by LVM/BSA criterion.

**Conclusion and Recommendation**

Body Mass Index (BMI) and Waist circumference (WC) had stronger correlations with echocardiographic determinants of left ventricular hypertrophy compared to waist hip ratio (WHR) in this study.

BMI and WC should therefore be the preferred measures of obesity for the assessment of the impact of obesity of left ventricular mass and hypertrophy.