SUMMARY

Background: Hypertension is the most common cardiovascular condition seen in primary care and leads to cardiovascular morbidity and mortality if not detected early and treated appropriately. Hyperuricemia is frequently present in patients with symptomatic heart failure, acute coronary syndromes, arterial hypertension, and atrial fibrillation. Serum uric acid is also considered a useful biomarker for mortality and an indicator of a poor prognosis in high-risk patients with several cardiovascular diseases. Atherosclerosis is frequently observed in patients with systemic hypertension with its attendant cardiovascular risks. Non-invasive imaging techniques such as carotid B-mode ultrasonography have the potential to directly measure and monitor atherosclerosis in asymptomatic individuals. However, hyperuricemia, a measure of endothelial dysfunction, as an independent risk factor for atherosclerosis is not well defined among Nigeria adult patients.

Objective: To determine the prevalence of asymptomatic hyperuricemia and its relationship with carotid intima-media thickness (CIMT) in patients with essential hypertension in a tertiary hospital.

Methods: One hundred and forty-four subjects attending the various out-patient clinics of the University of Port Harcourt Teaching Hospital who were found to have hypertension were included in the study. These were further stratified into two groups of seventy-two persons and classified as anti-hypertensive drug-experienced and drug-naïve subjects. Seventy-two age and sex matched individuals were included as controls. The participants in this study were assessed clinically to obtain their age, history and duration of hypertension, and smoking history. Those with diabetes mellitus or chronic kidney disease were excluded among other exclusion criteria. Blood pressure and anthropometric measurements were taken. Blood
samples were analyzed for lipid profile and blood glucose, serum uric acid and serum creatinine. CIMT was assessed using the linear array transducer of the ALOKA Prosound ultrasound machine.

**Results:** The mean age of the study population was 51.4± 12.9 years, and females were more than males in a ratio of 1.32:1. The mean body mass index of the cases was 29.5± 4.9 kg/m², and was significantly higher than that of the controls (27.2± 5.0 kg/m², p=0.001).
The mean SUA values of the hypertensive subjects was 382.8± 109.2µmol/l, and was significantly higher than that of the controls (349.6± 96.3µmol/l, p=0.03). Hyperuricemia was found in 61.7% of the cases and in 39.4% of the controls (p=0.002).
The mean CIMT of the hypertensive subjects was significantly higher than that of the control cohorts (0.79± 0.19mm versus 0.62± 0.78mm, p<0.001).
The hypertensive hyperuricemic patients had a significantly higher CIMT compared to the hypertensive non hyperuricemic patients (0.83±0.21mm versus 0.73± 0.15mm, p=0.006).
The normotensive subjects with hyperuricemia had CIMT values of 0.64± 0.09mm, while the normotensive subjects with normal SUA values had significantly lower CIMT values (0.61±0.07mm) (p<0.001). The hypertensive subjects who were drug-naïve had significantly higher CIMT than the hypertensive drug-experienced subjects (0.83±0.22mm versus 0.75±0.14mm, p<0.001). Six (8.3%) of the drug-experienced hypertensive patients had increased CIMT while 13 (18.1%) of the drug-naïve subjects had increased CIMT and this was statistically significant (p=0.001).
In standard multiple linear regression analysis, SUA values were found to be independently associated with CIMT values after adjusting for confounding variables including, SBP and TG.
Conclusion: 61.7% of the hypertensive individuals had hyperuricemia which is a surrogate marker for endothelial dysfunction. Hyperuricemia was an independent predictor of increased CIMT with relatively high sensitivity. These findings show that hyperuricemia could be a valuable surrogate marker for subclinical atherosclerosis.