The study design was an observational, cross sectional study of the “Correlation of renal ultrasound findings with renal function in hypertensive patients with albuminuria”. The sample size was one hundred and seventy patients for both the subjects and the controls, and they were matched for; age, sex and BMI. Two hundred and three consecutive patients that met the inclusion criteria were recruited for the study. One hundred and seventy three participants were finally analyzed.

Hypertension was defined as blood pressure of 140/90 mmHg or greater on two consecutive occasions or when the patient has been receiving antihypertensive drugs. A structured questionnaire which documented the historical details of the hypertension was completed per eligible subject. The urinary albumin was tested for, using albustix strips and was subsequently confirmed and quantified using bromocresol green method, and the creatinine was determined using alkaline picric acid (Jaffe method). Renal function was assessed using serum creatinine levels and the glomerular filtration rate (GFR) was estimated by the Cockcroft and Gault formula. The ultrasound scanning of the kidney was done in the radiology department of the University College Hospital, Ibadan by two sonologists. The renal ultrasound was done, with the patient in prone and oblique positions for the left kidney and supine position for the right kidney respectively, the liver was used as the window for the right kidney. The probe used was 3.5MHz frequency Aloka. There are two sonologists at each scanning sessions, and the two of them agreeing to the findings before it is recorded.

The subjects are the newly diagnosed hypertensives with albuminuria on albustix strip test while the controls are the newly diagnosed hypertensives with no albuminuria in their urine.
Results: There was no association between the left renal length and diastolic blood pressure of the subjects and the controls ($r = 0.069, p = 0.342$ and $r = 0.093, p = 0.389$) respectively, and also the SBP for the subjects and the controls ($r = -0.034, p = 0.798$ and $r = 0.125, p = 0.245$). There was no association between the SBP and GFR for both the subjects and the controls ($r = 0.099, p = 0.483$ and $r = -0.076, p = 0.593$). Also, no association between the DBP and the GFR for both the subjects and the controls ($r = -0.169, p= 0.116, r = 0.13 p = 0.908$).

The analysis of variance between the echogenicity and GFR of the subjects and the controls were significant ($f = 26.14, p = 0.000$). There was also, a significant negative association between the BMI and the GFR of the subjects but not of the controls ($r = -0.173, p = 0.032$, and $r = 0.049, p = 0.464$) respectively. There was a significant association between the albumin-creatinine ratio and the BMI ($r = 0.218, p = 0.028$). There was significant positive association between the GFR and the left renal length in both the subjects and the controls ($r = 0.334, p = 0.008$, and $r = 0.282, p = 0.009$), but for the right renal length and the GFR, there was positive association in the subjects but not in the controls ($r = -0.331, p = 0.008$ and $r = 0.16, p = 0.331$).

There was no correlation between the GFR and the albumin-creatinine ratio in the subjects ($r = -0.047 p = 0.156$). Also, there was no correlation between the SBP and DBP and the albumin-creatinine ratio for the subjects ($r = -0.118 p = 0.508, r = 0.063 p = 0.644$). There was no correlation between the renal length and the albumin-creatinine ratio ($r -0.018 p = 0.737, r = 0.04 p = 0.894$) for the left and right kidneys respectively. However, the analysis of variance between the albumin-creatinine ratio and echogenicity was significant ($f = 0.73, p = 0.023$)

The mean BMI for the subjects was $27.9 kg/m^2 \pm 6.3$ SD and that of the controls was $28.6 kg/m^2 \pm 7.5$ SD. There was no significant difference in it ($p = 0.52$).
The mean GFR for the subjects was 88.8mls/min ± 26.2 SD and 81.8mls/min ± 20.5 SD for the controls and it was significant (p = 0.05)

The mean SBP for the subjects was 151.1mmHg ± 22.1 SD and for the controls was 151.0 ± 16.8. The difference was not significant (p = 0.985)

The mean DBP for the subjects was 94.5mmHg ± 13.6 SD and for the controls was 94.4 ± 8.8 SD, the difference was not significant (p = 0.95)

The mean renal length for the subjects was 10.3cm and standard deviation was 0.58, while the mean renal length for the controls was 10.4cm and the standard deviation was 0.57. There was no difference in the renal length between the subjects and the controls (p = 0.192).

Conclusions: There was an association between the GFR and renal echogenicity and also, between the renal length and GFR for both the subjects and the controls. There was an association between the albumin-creatinine ratio and echogenicity and also, between the albumin-creatinine ratio and the BMI. There was also, an association between the BMI and the GFR of the subjects but not of the controls. However there was no association between the GFR and the albumin-creatinine ratio and also, between the albumin-creatinine ratio and the blood pressure measurements. There was no association between the renal length and blood pressure for the subjects and the controls. There was significant difference between the GFR of the subjects and the controls despite the fact that there was no significant difference in their blood pressure measurements.