SUMMARY

INTRODUCTION
Cardiovascular disease affects chronic kidney disease patients in all stages of the disease, and is a major cause of morbidity and mortality. The number and severity of the traditional cardiovascular disease risk factors increase exponentially as renal function deteriorates. However, this increased burden of traditional cardiovascular disease risk factors does not account fully for the increased cardiovascular diseases seen in CKD patients. Malnutrition and inflammation have been found to contribute significantly to cardiovascular disease in CKD, and this risk is independent of that imposed by traditional cardiovascular risk factors. There is a need to reduce cardiovascular morbidity and mortality in CKD patients before the onset of dialysis. Identification and quantification of risk factors is imperative for early diagnosis and management of the risk factors. This study was performed to determine the prevalence of malnutrition and inflammation in pre-dialysis CKD stage 3a, 3b and 4 patients; and to find the relationship with the traditional cardiovascular risk factors.

METHODS
One hundred and ten pre-dialysis CKD patients were recruited consecutively. 56 age and sex matched controls were also recruited for the study. Clinical assessments for hypertension, body mass index and subjective global assessment were carried out on the study subjects and controls. Fasting plasma samples were analyzed for serum lipids; serum albumin, C-reactive protein, glucose and serum creatinine. Estimated glomerular filtration rate was determined from the serum creatinine using the Modified Diet for Renal Disease equation (MDRD). Red cell distribution width was determined as part of the full blood count using the haematology auto-
Malnutrition was present if two out of three of: BMI < 18.5 kg/m², serum albumin < 30g/dl and SGA stages B or C were present; while inflammation was present if the CRP was > 10mg/L and RDW-CV was > 14.5%.

RESULTS

The prevalence of malnutrition and inflammation was higher among subjects compared to controls, p<0.05. Serum albumin and SGA which are markers of malnutrition were also higher in the study subjects than the controls, p<0.05. CRP and RDW were also significantly higher in the subjects than the controls, and in CKD stage 4 than CKD stage 3a and 3b, p<0.05.

Hypertension was the most common traditional cardiovascular disease risk factor in the study subjects occurring in 96.4%. This was followed by dyslipidemia 88.2%. The frequency of hypertension and diabetes did not differ between CKD stage 3a, 3b and 4, p > 0.05. Total cholesterol and LDL cholesterol were higher in the subjects than the controls, p < 0.05 and HDL cholesterol was lower in the subjects than the controls, p < 0.05. There was no difference in the lipids between CKD 3a, 3b and CKD 4, p < 0.05.

Malnutrition was not found to be a risk factor for hypertension, diabetes, high total and LDL cholesterol and smoking in our cohort of subjects, although the proportions of the traditional cardiovascular disease risk factors were higher in the malnourished than non-malnourished subjects, p>0.05. Inflammation was also not found to increase the risk of hypertension, diabetes, dyslipidemia and smoking in the cohort of subjects studied.
CONCLUSION

Pre-dialysis patients in LASUTH have a high prevalence of malnutrition, inflammation and the traditional cardiovascular disease risk factors. The occurrence of malnutrition and inflammation was found to be increased in subjects with more severe renal function impairment. The presence of malnutrition and inflammation were not found to be associated with the traditional cardiovascular disease risk factors in the subjects studied.