SUMMARY

Background: With the advent of HAART, HIV-infected patients have been able to achieve long term viral suppression. This has translated into longer life expectancy for these patients and lower risk of death from opportunistic infections. HIV patients now die more commonly from non-infectious conditions, such as cardiovascular, hepatic and renal diseases. The prevalence of HIV associated kidney diseases vary among the various communities where studies were conducted. HIVAN incidence and mortality have been found to be higher among Africans and African Americans. This study was aimed at finding the prevalence of kidney disease and HIVAN among HIV patients in UMTH, Maiduguri. It also set out to compare the clinical and pathologic features of kidney disease among HAART-experienced and HAART-naive patients.

Method: This study was carried out at the University of Maiduguri Teaching Hospital, Maiduguri, Borno state. Four hundred HIV-infected patients attending the RVI clinic were recruited for the study. Two hundred were HAART-experienced (on treatment for at least one year) and two hundred were newly diagnosed HIV patients who were yet to commence HAART at the time of recruitment. All patients had their relevant history taken and results obtained for serum creatinine, urea, urinalysis, total cholesterol, WBC, platelets, Hb, CD4 counts, and viral loads. Measurements of their weight, height and blood pressure were also obtained. Estimated GFR was calculated using Cockroft-Gault equation. Patients who had
proteinuria > 1g/24hours and/or GFR < 60ml/min/1.73m² had renal biopsy. The biopsy specimens were prepared on slides, stained with haematoxylin and eosin and examined by a pathologist under light microscopy with the investigator in attendance.

**Results:** Out of a total of 400 patients recruited for this study, 276 were females and 124 males with F:M ratio of 2.2:1. The age of the study population ranged from 18 to 61 years with a mean age of 35.65±8.94 years. Sixty per cent were married while 40% were single, widowed or divorced. Mean weight was 61.09±12.59Kg and mean BMI was 22.89±5.02Kg/m². The serum creatinine ranged from 57 to 1025µmol/l with a mean of 85.54±80.36µmol/l. The mean CD4⁺ count was 366.97±224.99 cells/µl with a range between 41 and 1046 cells/µl. The viral load range between 200 and 1,886,038/ml. Mean GFR was 79.93±27.91ml/min.

Out of the study population of 400, 82(20.5%) patients had chronic kidney disease defined as GFR <60ml/min and/or proteinuria >1g/day. The mean age was 38.33±10.33 years. Fifty-three (64.6%) were females and 29(35.4%) were males. Common symptoms of kidney disease were nocturia and polyuria occurring among 11% and 8.5% of patients respectively. The mean weight and BMI were 53.75±10.34Kg and 20.99±4.08Kg/M². Mean serum creatinine, urea and GFR were 153.45±157.91µmol/l, 5.82±3.49mmol/l and 42.03±13.61ml/min. The mean proteinuria, CD4⁺, and viral load were 1.732±0.70g/day, 323.70±202.05/µl and 116,996.43±327,963.88/ml respectively. Sixty-one (74.4%) had normal kidney size,
12(14.6%) had increased and 9(11%) had small kidneys on ultrasound scan. Collapsing FSGS was seen in 44 (64.7%), mesangial proliferative in 6 (8.8%), membranous nephropathy in 5 (7.4%), MPGN in 4 (5.9%), minimal change in 4 (5.9%), and interstitial nephritis in 3 (4.4%) patients respectively.

Sixty-one (74.4%) patients with kidney disease were HAART-naive while 21(25.4%) were HAART-experienced. The mean age was 37.42±9.96 years in HAART-naive group and 41.43±11.04years in HAART-experienced (p=0.459). Forty-one (67.2%) patients were female and 20(32.8%) were male in the HAART-naive group while 12(57%) were female and 9(43%) were male in the HAART-experienced group (χ² =0.405). The mean serum creatinine and GFR were 141.88±130.56µmol/l and 42.08±12.3ml/min in the HAART-naive group while 185.67±221.80 µmol/l and 41.89±17.2 were found in the HAART-experienced group respectively (p=0.09). The mean CD4+ count was 270.0±154.65/µl in the HAART-naive group while the HAART-experienced had 493.26±241.97/µl (p=0.001).

Out of the patients that consented to renal biopsy, Forty-four (66.7%) patients had typical HIVAN whereas 22(33.3%) had other histologic variants. The mean age of patients with HIVAN was 38.55±11.34 years while patients with other histologic variants had mean age of 34.23±8.51 years (p=0.110). Twenty-eight(63.6%) were females and 16(35.4%) were males among patients with typical HIVAN, whereas among patients with other histologic variants 14(63.6%) were females and 8(35.4%)
were males ($\chi^2 <0.0001$, $p=0.604$). There were no significant differences between the mean Hb, WBC, platelets count, proteinuria, urea and creatinine of the two groups. The mean CD4+ count in the HIVAN group was 278.68±182.79/µl and 437.95±250.74/µl in the other histologic variants group ($p=0.040$). The mean viral load in the HIVAN group was 137,405.70±36,285.90/ml and 102,499.84±35,224.80/ml.

HAART naive status is associated with an odds value of 4.168 of developing kidney disease. Patients with CD4+ counts lower than 200 cells/ml have an odds ratio of 1.581 of developing kidney disease. Haemoglobin concentration of less than 10g/dl has odds of 2.326 of developing kidney disease. Patients who are older than 35 years have odds of 1.483 of developing kidney disease than patients who are younger.

**Conclusion:** The prevalence of kidney disease irrespective of HAART exposure was 20.5%, whereas the prevalence of kidney disease in HAART-naive patients was 30.5% and 10.5% in HAART-experienced patients. HIVAN is the commonest pathologic diagnosis in HIV patients in Maiduguri. HIVAN is commoner among HAART-naïve than HAART-experienced patients. Among HAART-experienced patients HIVAN occurs in those that have advanced disease or those who are not doing well on HAART. Other pathologic entities were also seen in HIV patients. Further studies will be required to determine the natural history and optimum therapy for these other histologic variants since they occur more commonly among patients with higher CD4+ cell counts and lower viral loads.