Clinicopathological correlation of kidney disease in HIV infection pre- and post-ART rollout

Data note

Methods

Ethics approval for this study was granted in writing by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg, South Africa (clearance certificate numbers M1511104, M121184, M120874). This approval permitted a record review of all HIV-positive patients who underwent a kidney biopsy at two tertiary hospitals in Johannesburg within the defined study period. Informed consent for this retrospective record review was waived. Data from included patients was anonymised prior to statistical analysis.

Renal biopsies performed at these two tertiary hospitals, on HIV-positive individuals, from January 1989 to December 2014 were retrospectively analysed. Demographic data (age, sex and race), clinical parameters (CD4 count, HIV viral load, serum creatinine and urine protein creatinine ratio), indication for biopsy and renal histological pattern was recorded at time of kidney biopsy. The estimated glomerular filtration rate (eGFR) was calculated according to the CKD-EPI creatinine equation without ethnicity correction. ART rollout began in April 2004 in South Africa. Patients were divided into 2 groups - those who were biopsied pre-ART rollout and those biopsied post-ART rollout. These two groups were compared with respect to the above parameters.

In a subgroup of the patients biopsied between 2004 and 2014, additional data laboratory parameters (serum haemoglobin, serum albumin, serial serum creatinine and eGFR) and ART use (at time of biopsy) were recorded.

All renal biopsies were processed according to standard techniques for light microscopy, immunofluorescence and electron microscopy. All biopsies were reviewed by the National Health

Laboratory Service histopathology team who were aware of the HIV status of the patient at time of biopsy.

Histological diagnoses were tabulated using the 2018 Kidney Disease Improving Global Outcomes (KDIGO) Controversies Conference guidelines. As per this guideline FSGS (NOS) in the setting of HIV describes all non-collapsing forms of FSGS. Those ICGN with no identifiable comparative etiology other than HIV were categorized as uncharacterized ICGN with no etiology other than HIV. The biopsies with multiple diagnoses were assigned its major clinical-pathological diagnosis for the purposes of analysis.

All data was collected by Dr Nina Diana and Dr Alda Vermeulen from paper based patient hospital records and the electronic hospital laboratory system. All data was checked twice to ensure accuracy. Each patient was allocated a study number and data anonymised prior to entry into Microsoft Excel.

Shapiro Wilk W testing and visual inspection of the histogram plot indicated non-parametric distribution of baseline characteristics of the cohort; accordingly, central and dispersal measurements were described using the median and interquartile range (IQR), and the Kruskal Wallis ANOVA and Mann-Whitney U tests were used for comparative analyses. Kidney survival, defined by an eGFR above threshold for consideration for dialysis initiation in these institutions (15mL/min/1.73m^2), censored for patient default with preserved function, was fitted for patients in the subgroup using the Kaplan Meyer method; histological diagnoses were compared using Log-rank testing.