Short communication

The spectrum of kidney biopsy findings in HIV-infected patients

Abstract

Renal impairment during human immunodifficience virus(HIV) infection is a frequent occurrence, attributed to the infection itself or sometimes to antiretroviral therapy. It is a major factor in morbidity and mortality. The impact of renal histology on treatment choices highlights the importance of histological diagnosis in HIV-positive patients with renal impairment. This was a retrospective descriptive study carried out in the nephrology department of the Ibn Rochd University Hospital in Casablanca between January 2019 and December 2022 on renal biopsy punctures performed in HIV-infected patients. Our study included 19 patients who met the above criteria. The main indication for PBR was impure nephrotic syndrome in 55% of cases. The mean age of our patients was 37 years, with extremes of 28 and 57 years. There were 10 women and 9 men. Mean proteinuria was 3.41g/24h. Plasma creatinine averaged 32mg/l. Histological findings were dominated by segmental and focal hyalinosis (42.1%) and extramembranous glomerulonephritis (36.8%). Tubulointerstitial nephritis was observed in three patients and one patient had IgA nephropathy. The incidence of renal impairment in HIV infection is increasing. These patients should be systematically screened for potentially reversible nephropathy if treatment is initiated in time. This highlights the importance of close collaboration between nephrologists and infectious diseases specialists in the management and follow-up of these patients.

Keywords : HIV infection, renal biopsy puncture

Introduction

HIV infection is a major cause of morbidity and mortality worldwide. Once fatal, it is now classified as a chronic disease, thanks to easier access to antiretroviral treatment. It affects several organs, including the kidney. More recent epidemiological studies confirm the high incidence of kidney damage: from 15.5 to 38% of cases. (1 ; 2)There are many clinical and pathological aspects to kidney disease. They range from the usual causes to nephropathy directly induced by HIV. The risk factors for kidney disease identified in the literature include age, high viral load, low CD4 count, co-infection with hepatitis C virus (HCV), sub-Saharan origin, diabetes and hypertension(3). The main aim of our work was to shed light on renal damage in HIV-infected patients based on histological data from their renal biopsy punctures.

Patients and methods

Study design

This was a single-centre retrospective study conducted in the nephrology, dialysis and transplantation department of the Ibn Rochd University Hospital of Casablanca, from January 2019 to december 2022.

Demographic, Clinical, biological and histological data were collected from patient's medical records and from registers of renal biopsy punctures.

Inclusion criteria

All HIV-infected patients who underwent renal biopsy at our facility during the above-mentioned period.

Exclusion criteria

Patients with missing data were excluded.

Data collection

Demographic data including age, ethnicity, sex and duration of HIV infection were collected from medical records. Biological results were also collected, in particular plasma creatinine, 24-hour proteinuria, albuminemia and protidemia. Statistical analysis was carried out using STATA 15.1 software.

Results

19 patients were included in our study. Anthropometric and biological data are summarized in Tables 1 and 2.

Age (years)	37±12
Male (%)	47.3
Length of time of the HIV infection (months)	45.9 ± 47.5
Past Medical History	
Hypertension	2
Diabetes mellitus	2
Cardiovascular disease	1
History of tobacco use	5
Substance abuse	2
Hepatitis C–virus coinfection	1
On antiretroviral therapy	15

Table 1 : Patient characteristics

The mean age was 37 ± 12 years, and 47.3% were male. The average age of infection before the kidney desease was 45.9 months. Commorbidities were dominated by smoking in five patients.

Serum creatinine (mg/l)	32 ± 12,8
eGFR (ml/min/1,73 m²)	20.9 ± 16,4
Proteinuria (g/d)	3.41
Dipstick proteinuria	
0 or trace	1
1+	2
2+	4
3+	9
4+	3
Serum albumin (g/l)	31

Table 2 : Biological data

The indication for renal biopsy was mainly impure nephrotic syndrome in 55% of cases. Mean proteinuria was 3.41g/24h. Plasma creatinine averaged 32mg/l.

Histological findings were as follows:

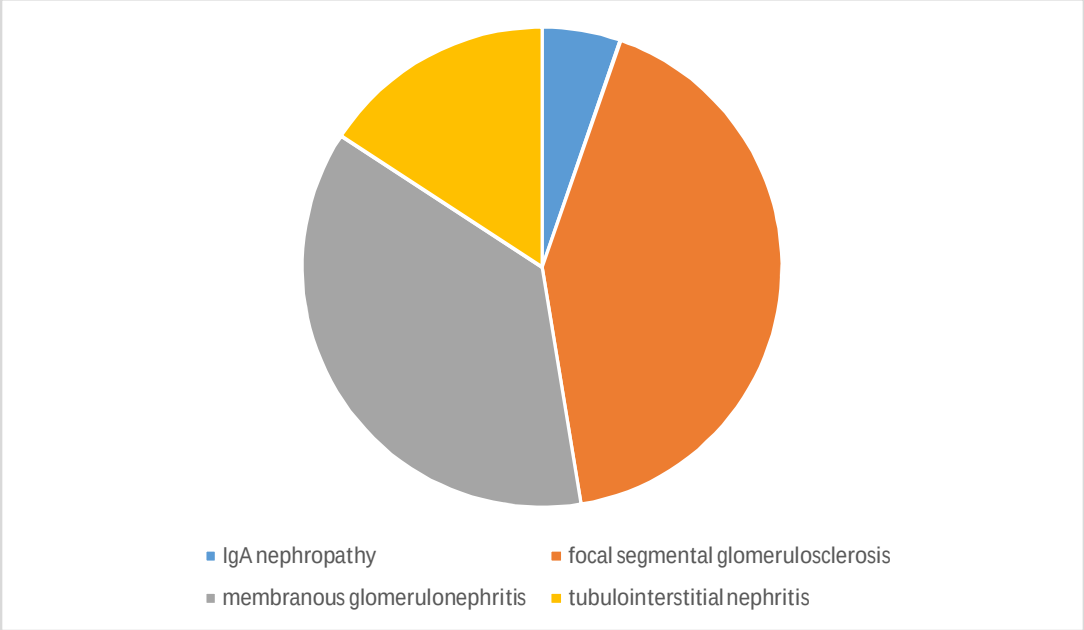

Figure 1 : Histological results

Histological findings were dominated by focal segmental glomerulosclerosis (42.1%) and extramembranous glomerulonephritis (36.8%). Tubulointerstitial nephritis was observed in three patients and one patient had IgA nephropathy.

Discussion

Based on the 2018 estimates from the Joint United Nations Programme on HIV/AIDS (UNAIDS), approximately 37.9 million individuals globally, including both adults and children, are living with HIV infection. In the United States, around 1.1 million people are currently living with HIV, with approximately 39,000 new infections reported annually, according to the latest 2016 data. The extended lifespan and aging of this population, thanks to effective

antiretroviral therapies, are contributing to a rise in the incidence of HIV-related kidney disorders and various other comorbid conditions. (4)

This study held a twofold significance: First and foremost, it enabled usdetermining the histological aspect of renal damage in HIV infection. Secondly, it supported the need for close collaboration between nephrologists and infectiologists in the overall management of patients living with HIV, by proposing regular monitoring of renal function with a view to detecting potentially reversible abnormalities if treated early and correctly.

A biopsy cohort of 437 HIV positive patients at Columbia University Medical Center between January 1, 2010, and November 30, 2018 showed a surprising diversity. Immune complex glomerulonephritis (ICGN) and diabetic nephropathy each were more prevalent than HIV-associated nephropathy, with tenofovir nephrotoxicity, FSGS not otherwise specified (NOS), and global sclerosis (NOS) following in frequency. HIV-associated nephropathy was the most prevalent condition among patients not receiving antiretroviral therapy, with 94% of these patients being Black. The presence of FSGS (NOS) was notably associated with both Black race (68%) and antiretroviral therapy use (77%), suggesting that some cases may represent a milder form of HIV-associated nephropathy. The most frequently observed ICGNs were IgA nephropathy and membranous glomerulopathy, both of which were associated with antiretroviral therapy in over 90% of cases, followed by hepatitis C-associated proliferative ICGN. Among the 16 cases of uncharacterized ICGN with no identifiable etiology, 69% were not on antiretroviral therapy, potentially representing genuine HIV-associated immune complex kidney disease. Additionally, dual diagnoses were present in 17% of patients, highlighting the complexity of the lesions. (4).

Conclusion

The incidence of renal impairment in HIV infection is increasing. These patients should be systematically screened for potentially reversible nephropathy if treatment is initiated in time. This underscores the importance of regular monitoring of patients living with HIV, and of referring them to a nephrologist if renal damage is detected.

Rerefences

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