

Renal Disease among HIV Positive Patients in Senegal

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Abstract

Introduction: Renal disease (RD) in human immunodeficiency virus (HIV) infection is a decisive turning point in the development and prognosis of this disease. In Africa, the prevalence varies between 2.5% and 48.6%. In Senegal, little data are available in the literature. The objective of our study was to describe the epidemiological, clinical, paraclinical, therapeutic and progressional aspects in patients living with HIV (PLWHIV). **Patients and methods:** This was a retrospective, descriptive and analytical study carried out over a 10-year period in the Department of Internal Medicine and Nephrology at the Aristide Le Dantec Hospital in Dakar, Senegal. We included all 15-year old and above PLWHIV with available CD4 count and viral load. **Results:** Out of 248 PLWHIV, 32 had kidney disease (KD), which means a hospital prevalence of 12.9%. The mean age was 51.22 ± 10 years (extremes of 36 and 77 years) with a sex ratio (male/female) of 1.28. Renal signs were dominated by glomerular nephropathy syndrome. It was present at 80%. Tubulo-interstitial nephropathy syndrome and chronic uremic syndrome accounted for 6.25% and 3.1% of cases, respectively. Renal function Impairment was present in 21 patients with 18 cases of acute kidney injury (85.7%) and 3 cases of chronic renal failure (14.3%), including 2 in stage 5 of chronic kidney disease. Renal biopsy (RB) was indicated and performed in 20 (62.5%) patients with glomerular signs in 12 patients (60%). Glomerular lesions were dominated by focal and segmental glomerulosclerosis (FSGS) in 6 cases, membranous nephropathy (MN) in 4 cases and minimal change disease (MCD) in 2 cases. Tubulo-interstitial and vascular lesions were present in 45% and 12.5% of cases, respectively. In highly active antiretroviral therapy (HAART), 12 (37.5%) patients had total remission, 9 (28.12%) had partial remission. One (3.12%) death from severe meta-

bolic acidosis on chronic renal failure was deployed. **Conclusion:** This study illustrates the high prevalence of RD in PLHIV in our exercise context.

Keywords

Kidney Disease, HIV, HIVAN, Senegal

1. Introduction

Human immunodeficiency virus (HIV) infection is a chronic systemic disease that exposes to many complications including renal disease [1]. Renal disease is frequently encountered in HIV-infected patients and is a critical turning point in the prognosis and progression of these patients. It is linked to the viral infection itself; complications or treatment. The most commonly recognized histological translation is HIV-associated nephropathy (HIVAN). Sub-Saharan Africa counts for nearly 60 per cent of the world's HIV-infected population according to the World Health Organization (WHO) estimations in 2015. Epidemiological data on the overall prevalence of renal disease in this region vary between 2.5% and 48.6% of cases [2] [3]. In Senegal, 0.7% of the general population is infected with HIV. However, the prevalence of renal disease in this population remains unknown. This study was used to determine the epidemiological, clinical, paraclinical, therapeutic and progressional profiles of renal disease in PLHIV.

2. Patients and Methods

This was a retrospective descriptive and analytical study over a 10-year period from 1st of January 2004 to 31st of December 2014. We included all 15-year old and above PLHIV, hospitalized or followed in the departments of internal medicine and nephrology of the Hospital Aristide Le Dantec of Dakar (Senegal). For each PLHIV included, socio-demographic, clinical, paraclinical, therapeutic and progressional data were identified. The studied parameters were renal function, 24 hrs Pu, ultrasound of the kidneys and the urinary tract and RB. Viral load and CD4 count were recorded. Kidney disease was defined according to the KDIGO 2013 criteria [4]. The data collection was done manually using on study record forms. Data entry was done using Sphinx Plus2 software Lexica Edition. All the data were statistically analyzed using the R version R.3.2 software. The qualitative variables were presented as a percentage and the quantitative variables were presented as means, more or less the standard deviation or with a minimum and a maximum. The analytical study was done with cross-tabulations. To compare the frequencies, the KHI 2 test or the Fisher test were used. The difference was statistically significant for "p" value < 0.05. The local ethics committee gave its approval for carrying out this study.

3. Results

Two hundred and forty-eight (248) PLHIV were collected during the study pe-

riod. Thirty-two (32) patients had renal function impairment, which means a hospital prevalence of 12.9%. Among the patients with renal function impairment, there were 18 men and 14 women, a sex ratio (male/female) of 1.28. Their mean age was 51.22 ± 10.88 years. The predominant age group was 40 to 60 years with a prevalence of 40.6% (Figure 1). Renal signs were dominated by glomerular nephropathy syndrome (80.8%). Tubulo-interstitial nephropathy syndrome was noted in 9.3% of cases. Laboratory results showed a mean creatinine level of $52.75 \text{ mg/l} \pm 9.28 \text{ mg/l}$ [14.62 - 134 mg/l]. Twenty-one (21) patients had renal function Impairment (RfI), which makes 65.6%. Eighteen (18) patients had an AKI (85.7%) and three patients (14.3%) had CRF. Fluid and electrolytic disorders were represented by hyponatremia (25%), hypokalemia (12.5%) and hyperkalemia (18.75%). All patients had HIV type1 profile. The average CD4 count was $204/\text{ml} \pm 12.8 \text{ cells/ml}$ with extremes of 20 and 614/ml. Sixteen patients (50%) were already on stage 3 of the WHO at the time of diagnosis, 10 patients (31.3%) on stage 2 and 6 patients (18.8%) on the AIDS disease stage. Proteinuria was present in 18 patients (56.25%) with the mean value of $3.3 \text{ g/24h} \pm 7.11 \text{ g/24h}$. Thirteen (13) patients; with a prevalence of 72% had glomerular proteinuria. Aseptic leukocyturia was present in 2 patients (6.25%) and microscopic hematuria in 3 patients (9.37%). Morphologically, kidney size was normal in 84.3% (27 cases), increased in 6.25% (2 cases) and decreased in 9.37% (3 cases). The average size was 108.34 mm (79 - 126 mm) on the right and 108.13 mm (80 - 123 mm) on the left. Parenchyma-sinus differentiation was good in 78.1% patients (27 cases), fair in 6.25% (2 cases), and poor in 15.6% (6

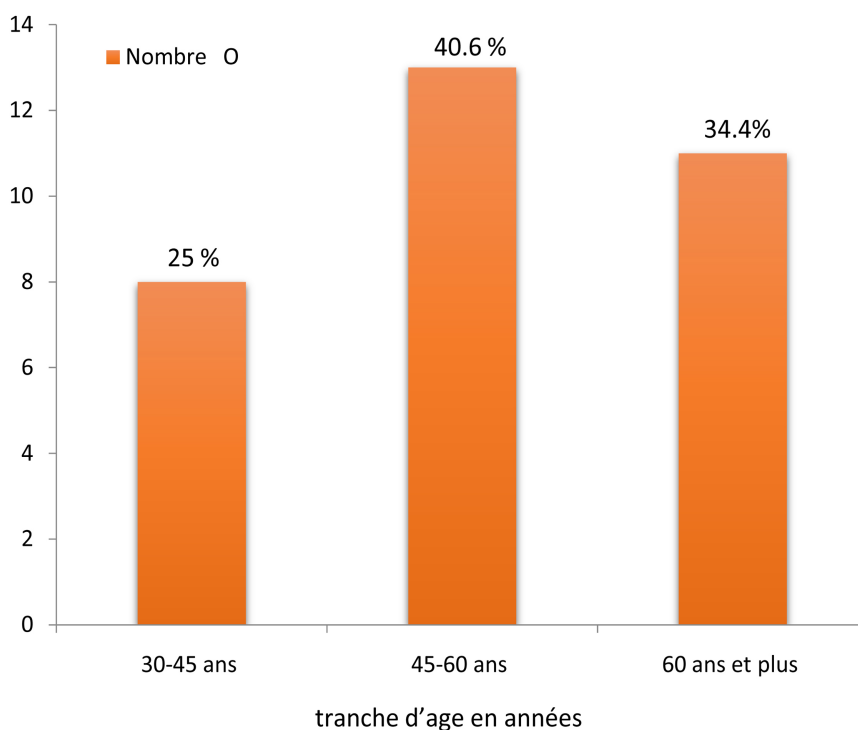


Figure 1. patient distribution by age.

cases). On histology, RB was performed in 12 patients all with glomerular nephropathy syndrome. Non collapsing FSGS was present in 4 patients (33%), MEN in 4 patients (33%) and MCD in 2 patients (17%). Two patients (17%) had HIV-associated nephropathy (HIVAN) lesions. All biopsy patients had tubulo-interstitial lesions either alone or in combination with other lesions. Secondary tubulo-interstitial lesions from drug toxicity of ARVs were noted in 9 patients (45%). Thrombotic microangiopathy and nephroangiosclerosis were the main vascular lesions found (**Table 1**). In bivariate analysis, the occurrence of renal disease was associated with decreases in CD4 ($p = 0.0052$) and initiation of first-line antiretroviral therapy ($p = 0.0127$).

4. Discussion

The prevalence of renal disease in HIV varies between 2% and 48% according to the series [2] [5] [6]. In Senegal, despite the low prevalence of HIV infection, we report an overall prevalence of 12.9% of renal function impairment. In Europe, the authors reported a prevalence varying between 2% and 30% [6] [7] [8]. In Africa, prevalence also varied between 6% and 48%, with a clear increase over the past 10 years. South Africa, which is a country with a high HIV endemicity, encompasses a RD prevalence of 6% [9], which is relatively low compared to our study. However, in most African series, the prevalence is higher than ours; up to 48.5% in Uganda [10] [11]. This could be explained by the high prevalence of HIV infection and the difficulty of access to treatment in these areas. RfI was the most frequent complication in HIV infection. It was present in our study in 21 patients, which means 65.6%. We noted 85.7% of AKI and 14.3% of CRF, including 2 in stage 5 of chronic kidney disease and 1 in stage 3. In the literature, HIV prevalence varies between 1% and 54% depending on the series [12] [13] [14]. Histologically, FSGS is the most common glomerular lesion in our series. It was found in 6 patients (50% of cases) including 4 (66.7%) conventional FSGS and 2 (33.3%) collapsing FSGS commonly known as HIVAN. We report to our

Table 1. Summary of various histological lesions found.

Histologic lesions		Number	Percentage	
Glomerular lesions	FSGS	Classic FSGS	4	33%
		HIVAN	2	17%
	MEN	MEN type I	2	17%
		MEN type II	2	17%
	MCD	2	17%	
	Tubulo-interstitial lesions	Fibrosis	6	30%
Edema		3	15%	
Sjogren-like		1	5%	
Necrotic tubulopathy		4	20%	
Vascular lesions	Thrombotic microangiopathy	3	15%	
	Nephroangiosclerosis	1	5%	

knowledge the first three cases of HIVAN in Senegal. The prevalence of HIVAN varies according to the studies (between 14.1% and 57% of cases in Europe [15] [16], around 6.9% of cases [17] in the USA and 5.8% of cases in India [14]. In Thailand, no case of HIVAN has been objectivated by Karkiat P [9]. MEN and MCD lesions were found in 33%, 3% and 16.7% of our study population, respectively. These lesions are rarely described in the literature. Other glomerular lesions described in HIV, include membranoproliferative glomerulonephritis (MPGN), acute glomerulonephritis (AGN), amyloidosis, lupus-like, immune complex glomerulonephritis or crescentic glomerulonephritis (CGN) have not been found in our study population. All our patients had tubulo-interstitial lesions. This could be explained by the massive use of phytotherapy in our country. To this phytotherapy are added the toxicity of the ARV and the interstitial lesions directly related to HIV. Indeed, 9 patients out of 20 biopsied (45%) had a renal toxicity related to the ARV treatment. Tubulo-interstitial lesions secondary to ARV treatment are described in the literature: 2 cases by Bentata [18] and 13 cases (27.1%) by Zaidan [19]. Thrombotic microangiopathy lesions were described in HIV with the highest frequency found by Abraham B, which reported 14 cases of MAT [20]. In our series, it was demonstrated in 3 patients or 15% of the histological lesions.

On the progression aspect, 21 (65.62%) patients had a favorable outcome with 57% total remission (12 patients) versus 43% partial remission (9 patients). Eight patients (25%) progressed to CKD, 3 of them at the end stage requiring chronic dialysis. Three (3) patients (or 9.37%) died, two of which were directly related to HIV infection and one to chronic kidney disease.

5. Conclusion

RD still remains common among PLHIV in our country. It is an important morbidity and mortality factor. Sub-Saharan African countries in general and Senegal in particular, should put in place all needed human and technical resources to the fight against this scourge.

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