

Full Length Research Paper

# Prevalence of glomerular nephropathies in HIV infection in a Department of Internal Medicine in Abidjan (Côte d'Ivoire)

<sup>1</sup>Ouattara B, <sup>2</sup>Yao KH, <sup>3</sup>Kra O, <sup>2</sup>Konan S, <sup>1</sup>Kouassi L, <sup>1</sup>Kone S, <sup>2</sup>Diallo DA, <sup>1</sup>Kadjo KA, <sup>4</sup>Niamkey EK.

<sup>1</sup>Department of Internal Medicine, Alassane Ouattara University, Bouaké, Côte d'Ivoire.

<sup>2</sup>Department of Nephrology, Felix Houphouët Boigny University, Abidjan, Côte d'Ivoire.

<sup>3</sup>Department of Infectious Diseases, Alassane Ouattara University, Bouaké, Côte d'Ivoire.

<sup>4</sup>Department of Internal Medicine, Felix Houphouët Boigny University, Abidjan, Côte d'Ivoire.

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HIV-associated glomerular nephropathy is a cause of chronic kidney failure increasingly described since the advent of HIV infection. The aims of this study was to determinate its prevalence in chronic kidney failure in a Department of Internal Medicine. It was a retrospective transversal study conducted from January 2007 to December 2012 in the Department of Internal Medicine of the University Teaching Hospital of Treichville on medical data of the patients admitted for chronic kidney failure with HIV-associated glomerular nephropathy. Of 335 patients followed up, 74 of them exhibited HIV-associated glomerular nephropathy (17%). The median age was  $36 \pm 8$  years and the sex-ratio was 0.23. A positive retroviral status was discovered in the regression of glomerular nephropathy in 44 patients (59.5%). For 48.3% of cases, chronic kidney failure was the hospitalization cause. Clinical signs at admission were dominated by clinical anemia (80.6%) and edemas of lower limbs (51.6%). The average proteinuria was  $7.86 \pm 5.5$  grams per 24 hours. According to the K/DOQI, kidney failure was at stage V in 64.5% of the cases. The mortality was 32.5%. HIV-associated glomerular nephropathy was a frequent cause of chronic kidney failure in our study and of poor prognosis.

**Key words:** Proteinuria, chronic kidney failure, glomerular nephropathy, HIV, prevalence, HIVAN, GNCI, Abidjan, Côte d'Ivoire.

## INTRODUCTION

With a prevalence of 3.4%, Côte d'Ivoire remains the most HIV affected country in Sub-Saharan Africa (UNAIDS, 2011). HIV affects the whole organs, which makes it worse (Girad et al., 1998). In kidney disease, chronic kidney failure is a complication increasingly described (Woolds-Kaloustian et al., 2008). In the USA, chronic kidney failure represents between 10 and 20% of seropositive patients admissions and constitutes the 4<sup>th</sup> cause of death of patients when the infection develops into aids (Gupta et al., 2005). The main cause is glomerular nephropathy which includes HIV associated nephropathy (HIVAN) and glomerulonephritis with immune complex (GNCI). The HIVAN affects almost exclu-

clusively patients of Sub-Saharan Africa (Gupta et al., 2005; Kara et al., 2008). It usually associates impure nephrotic syndrome with rapidly progressing kidney failure. As to the GNCI, it is a heterogeneous group of glomerulonephritis observed mostly in white patients (Gupta et al., 2005). Unlike HIVAN, proteinuria in the GNCI has variable flow associated to high blood pressure and less severe kidney failure (Di Belgiojoso et al., 2002; Girard et al., 1998). However, the difference between those two entities is histological after renal biopsies. The histological study revealed a case of segmental and focal hyalinose with a retraction or collapsus of the flocculus in HIVAN and complex immune deposits circulating in the glomerulus in the GNCI (Weiner et al., 1998; Di Belgiojoso et al., 2002). In Sub-Saharan Africa, especially in Côte d'Ivoire, kidney biopsies are rarely undertaken due to technical reasons. In the absence of kidney biopsies with

\*Corresponding author. E-mail: [bourhaima@yahoo.fr](mailto:bourhaima@yahoo.fr)

**Table 1.** Admission motives and clinical signs.

	<b>Parameters</b>	<b>Number of patients</b>	<b>Percentage</b>
<b>Previous medical history</b>	Shingles	34	45,9
	Long term fever	20	27
	Tuberculosis	10	13,5
	Cerebral Toxoplasmosis	2	2,7
	Abscess hepatitis	4	5,4
	High blood pressure	8	10,8
<b>Admission motives</b>	Dyspnea	28	37,8
	Abdominal distension	6	8,1
	Vomiting	4	5,4
	Loss of consciousness	8	10,8
	Kidney failure	32	43,2
<b>Clinical examination</b>	Lower limb edema	34	45,9
	Clinical Anemia	35	47,3
	Edema-ascitis syndrome	4	5,4
	High blood pressure	12	16,2
	Encephalopathy	12	16,2

the histological study, the overall objective of our study was to assess HIV-associated glomerular nephropathy without etiological presumption in the chronic kidney failure in a Department of Internal Medicine. The specific objectives aimed at describing socio-demographic, clinical, therapeutic, and scalable aspects of this affection in the Department of Internal Medicine of the University Teaching Hospital of Treichville.

**MATERIALS AND METHODS**

This study was a prospective longitudinal one bearing on patients hospitalized from January 2007 through December 2012 in the Department of Internal Medicine of the University Teaching Hospital of Treichville for glomerular nephropathies observed during the HIV infection. Glomerular Nephropathy diagnosis was retained before a proteinuria higher than 2g/24 hours or proteinuria between 1 and 2g/24 hours associated to a hematuria with or without high blood pressure. The retroviral serology was carried out by means of a quick test which result, in the event of positivity, was confirmed in the laboratory with ELISA technic. We excluded from this study any patient showing glomerular nephropathy in

a situation of diabetes, sickle-cell, urinary bilharzias, viral hepatitis B or C, nonsteroidal anti-inflammatory consumption in the long-term, associated bacterial urinary infection and cancer.

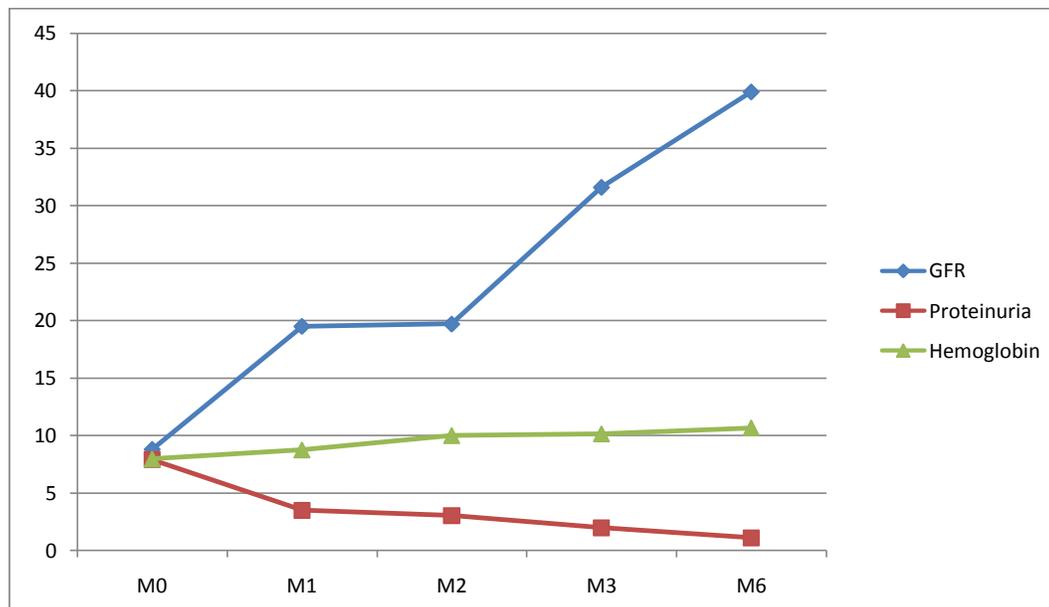
**RESULTS**

Over the study scope of time, of 435 patient hospitalized for chronic kidney failure causes, 74 patients exhibited a HIV-associated glomerular nephropathy (17%). The median age was 36 ± 7 years ranging from 24 years to 56 years and the sex-ratio was 0.23. All the patients were infected by HIV-1.

The HIV serology was known in 30 patients (40.5%) and discovered during the hospitalization in 44% of patients (59.5%). Previous medical history, hospital admission reasons and clinical examination signs are provided in table 1. The average proteinuria was 7,4 ± 5,2 grams per 24 hours ranging from 1,5 g and 24 g. Kidney failure was in terminal stage in 70.2% of the cases, severe in 8.1% of the cases, moderated in 19% of the cases and minor in 2.7% of the cases. The average hemoglobin rate was 7.7±1.5g/dl. More than 67% of patients had their hemoglobin rate lower than 8g/dl (table 2).

**Table 2.** Admission biological Signs.

Biological Signs	Parameters	Number of patients	Percentage
Proteinuria (g/24h)	<3	14	19
	3 -6	22	29,7
	>6	38	51,3
CD4lymphocytes rate (elements/mm <sup>3</sup> )	<150	36	48,6
	150 -250	18	24,3
	>250	20	27
Rate of hemoglobin (g/dl)	< 8	50	67,5
	8 -12	22	29,7
	>12	2	2,7

**Figure 1:** Evolution of patients according to GFR, proteinuria and the rate of hemoglobin during over the first six months (M).

The average CD4 lymphocyte rate was  $197 \pm 147/\text{mm}^3$  and more than 48% of patients had a CD4 lymphocyte rate lower than  $150/\text{mm}^3$  (table 2). Combination therapy treatment was administered to all the patients (100%), transfusion in 50 patients with severe anemia followed by erythropoietin prescription and dialysis in 11.8% of patients with end-stage kidney failure. The evolution was favorable in 50 patients (67.5%) with an improvement of the kidney failure, a decrease of proteinuria flow, stabilization of the rate of hemoglobin and an increase of the rate of CD4 lymphocytes with an average rate of  $431 \pm 150/\text{mm}^3$  at 6 month (figure 1). We recorded 24 deaths (32.5%) of which 10 during the first two months. Of these cases, eight had a CD4 lymphocyte rate lower than  $100/\text{mm}^3$  and end-stage kidney failure with severe anemia at the onset of the antiretroviral combination

therapy treatment. Of the ten patients dialyzed (11.8%) two died respectively due to dialysis catheter infection and decompensated anemia.

## DISCUSSION

Glomerular nephropathy prevalence during the HIV infection was high in our study. It represented 17% of chronic kidney failure etiologies. This result was similar to the results of a prior study carried out in the same Department solely on HIVAN (Ouattara et al., 2011). HIV-associated glomerular nephropathy prevalence varies from one country to the other according to the prevalence of HIV infection (Naicker et al., 2010; Kara et al., 2008). Most of the patients were young and female.

In Sub-Saharan Africa, nearly 60% of HIV infected patients are females (UNAIDS, 2008). This female vulnerability is related on the one hand to the poor socio-economic conditions which expose them to prostitution (Garcia-Calleja et al., 2006). In more than half of the cases, glomerular nephropathy was the HIV infection discovering circumstance denoting thus the importance of voluntary screening of HIV infection.

Previous medical histories of our patients are an indication of the advanced stage of retroviral infection (Table 1). However, glomerular nephropathy cases were brought at the seroconversion stage (Gardner et al., 2003).

The main hospital admission reasons (dyspnea, abdominal distension, lower limb edemas and vomiting) were essentially the signs of nitrogen retention related to the severity of kidney failure. As a matter of fact, more than half of the patients exhibited end-stage kidney failure at the diagnosis. At this stage, severe complications such as anemia with a prevalence estimated at 50% arise (Mc Clellan et al., 2004). A clear correlation was defined between the anemia prevalence and chronic kidney failure: a quarter of patients at stage I of chronic kidney failure at stages II, III, and IV and three quarters of chronic kidney failure at the stage of dialysis (Mc Clellan et al., 2004).

Chronic kidney failure anemia can result in various mechanisms. However the deficit of erythropoietin synthesis is the most frequent cause and the most specific (Mc Clellan et al. 2004, KDOQI, 2006). Nearly half of our patients had profound immunosuppression (Table 2).

The occurrence of glomerular nephropathy in HIV infection at a late stage suggests that it should classify HIV infection as AIDS and initiate retroviral therapy as early as possible (WHO, 2007). HIV-associated glomerular nephropathy prognosis in Africa is poor as compared to the extent of immunosuppression, the inaccessibility of dialysis by most of patients and economic difficulties of these patients (Ouattara et al., 2011).

## CONCLUSION

Glomerular nephropathy in HIV infection was a frequent cause of chronic kidney failure in our study. It affected mostly young female adults. More than half of patients had a kidney failure at the end stage at the diagnosis. The mortality was high. These results exhibit four interests: the intensification of the sensitization and the education of the general population on the danger that is aids, HIV infection voluntary screening in view of its early treatment, early screening of glomerular nephropathy by means of proteinuria search with test strip in case of HIV infection and the opening of accessible centers for dialysis.

## CONFLICTS OF INTERESTS

Authors report no conflict of interest.

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