

Epidemiological and Clinical Characteristics of Renal Diseases Diagnosed by Biopsies in Ivory Coast

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Abstract

Renal biopsy is an invasive procedure used to evaluate the activity and the therapeutic management of kidney disease and kidney transplantation. **Objective:** The aim of this study was to describe the epidemiological, clinical, and pathological features of kidney disease diagnosed by biopsy in the Ivory Coast. **Materials and Methods:** This was a descriptive and prospective study conducted between January 2015 and December 2018 in the Department of Anatomy and Cytology of the Pathology of Cocody (Abidjan) and Bouake. Specimens were obtained from the nephrology department of Ivory Coast and from teaching hospitals in Togo, Guinea, Burkina Faso, and Mali. Samples were analyzed according to standard renal biopsy procedures. One kidney fragment was fixed in acetic acid formalin (AAF) for optical microscopy examination. The other fragment, soaked in physiological water, was immediately sent for immunofluorescence examination. All renal pathologies were included in this study. The study parameters were frequency, age, sex, origin, occupation, clinical and biological signs, and pathological aspects with optical microscopy, and immunofluorescence. **Results:** 153 cases (2.23%) of kidney

biopsies were examined on a total of 10,573 specimens. Ivory Coast specimens accounted for 91.5% of cases (n = 140). Nephrotic syndrome (49%) was the most common clinical sign and indication for renal biopsy, followed by acute renal failure (16.3%), chronic renal failure (19.6%), and a combination of chronic renal failure with hypertension (11.18%) and glomerulonephritis (4%). Mean proteinuria was 3.03 g/24h (range, 0.14 to 11.5 g/24h). Histologically, 90.8% (n = 139) were glomerular nephropathies, including 26.6% HIV-associated nephropathy, 17.3% focal segmental glomerulosclerosis, 13.6% nephroangiosclerosis, 11.5% post-infectious glomerulonephritis, 9.3% membranous glomerulonephritis, and 21.6% miscellaneous glomerular nephropathies (n = 30). The incidence of various tubulo-interstitial lesions was 9.2% (n = 14). **Conclusion:** Glomerular nephropathies represent the most important renal diseases. Young people are most commonly affected with a high prevalence of focal segmental glomerulosclerosis and HIV-associated nephropathy.

Keywords

Kidney, Biopsy, Disease, Pathology, Ivory Coast

1. Introduction

Chronic diseases are one of the most important non-communicable diseases in the world. Approximately 10% of the world's population suffers from chronic renal failure, ref. [1]. In most developing countries, glomerulonephritis is the most common cause of the end-stage renal disease (ESRD), and the most common kidney disease in hospitalized patients undergoing a renal biopsy, ref. [2] [3].

The indications for performing this practice continue to increase because of the need for reliable diagnosis for efficient treatment of renal disease in both native and transplant kidneys, ref. [4]. The common indications for renal biopsy are varied. Renal biopsy is recommended for nephrotic syndrome, prolonged acute renal failure, unexplained chronic renal failure, systemic renal disease, non-nephrotic proteinuria, isolated microscopic hematuria, familial renal disease, and renal transplantation failure, ref. [5].

The spectrum of renal biopsy findings differs according to geographic area, ethnicity, and environmental and socioeconomic factors. IgA nephropathy (IgAN) is the main pathological outcome of rare biopsies in many European countries, ref. [6] [7] in Australia, ref. [8] and in most Asian countries, ref. [9] [10] [11]. In contrast, Focal segmental glomerulosclerosis (FSGS) is the predominant pathological outcome in the United States, ref. [12] [13] and Brazil, ref. [14]. While membranoproliferative glomerulonephritis (MPGN) is the most common pathology in South Africa, ref. [15] and membranous nephropathy (MN) are the most common pathology in biopsies in Spain, ref. [16].

In Ivory Coast, the practice of performing renal biopsies is rare and low. Therefore, we conducted this study to investigate the epidemiology and preva-

lence of diseases detected by biopsies in our context.

2. Materials and Methods

2.1. Geography and Situation of the Practice of Nephropathology

Ivory Coast is a West African country with an estimated area of 322,462 km². The political capital is Yamoussoukro and the economic capital is Abidjan. The population is mainly rural and was estimated at 22,671,331 inhabitants according to the last census conducted by the National Institute of Statistics, ref. [17] in 2014. The population is composed of 11,716,826 men (51.7%) and 10,954,505 women (48.3%). It is characterized by a high proportion of young people under 35 years of age, who represent 75% of the total population and of whom 48% are under 15 years of age. Health care is relatively low, with 1 doctor per 9,908 inhabitants, ref. [17]. The country has only 4 university hospitals in Abidjan (Cocody, Treichville, Yopougon, and Angre) and 1 in the interior, in Bouake. The country has only two (2) nephrology departments in Abidjan and one (1) nephrology department in Bouake. The Kidney Transplantation Unit, established in 2014, coordinates the kidney transplantation program on Ivory Coast. Hemodialysis centers are located in the various emergency medical services spread over a dozen cities in the country. The dialysis activity is carried out by nephrologists and specialized nurses in these services. The majority of patients admitted to these services face high dialysis costs, ref. [18]. Renal biopsies have been performed since April 2015, following the establishment of a renal pathology department at Cocody University Teaching Hospital. Ivory American pathologists and nephrologists, as well as others from the West African region (Burkina Faso, Mali, Guinea, and Togo), received support and training from the pathology cytology development and renal pathology research unit at Tenon Hospital (France). The difficulties we encountered were related to the transfer of biopsies, the lack of fluid and irrigation fluid at Michel, the lack of supplies, and the difficulties in obtaining units. At the technical level, we have only one cryostat for frozen sections and one technician who is sometimes used for other common or specialized techniques.

2.2. Methods

This was a descriptive and prospective study conducted between January 2015 and December 2018 in the Department of Anatomical and Cytological Pathology of the University Teaching Hospital of Cocody (Abidjan) and Bouake. The samples were collected from different institutions, including the nephrology department of the University Teaching Hospital of Yopougon, some private clinics (Cocody Danga Clinic, International Clinic of Holy Anne Marie), and the nephrology department of the University Teaching Hospital of Lomé, Conakry, and Ouagadougou. Biopsy specimens were analyzed according to the classical protocol for the management of renal biopsies, together with a well-informed request for pathological examination. This request form included the following

information: sociodemographic data (surname, first names, date of birth, sex, occupation, place of residence, telephone and contact person of the patient...), personal history (medical, surgical, gynecological-obstetrical and lifestyle), clinical signs and biological findings (serum complement, antinuclear factors, ANCA, cryoglobulinemia, viral serology, proteinuria) and possibly information about previous biopsies. Two fragments were systematically performed. One fragment was fixed with acetic acid-formalin and examined under a light microscope. This fragment was subjected to the classical histopathological technique and then stained with various stains such as Masson trichrome, periodic acid-Schiff, hematoxylin-eosin, and Jones silver. The other fragment was soaked in physiological water and sent to the Pathology Department within 3 hours in a cool box for immunofluorescence examination. The second fragment was then frozen in liquid nitrogen or cryostat at -30°C . The frozen sections were spread on Super Frost slides. DAKO polyclonal antibodies against IgA, IgG, IgM, C3, C1q, light chains (Kappa, Lambda) were used for immunofluorescence. Kidney biopsy fragments from Togo were placed in Michel's fluid for immunofluorescence examination and fixed in acetic acid formalin for light microscopic examination. All biopsies with renal pathologies that histologically showed at least 3 non-sclerotic glomeruli were included in the study. The parameters analyzed were: Frequency, age, sex, origin, occupation, clinical and biological signs, and pathological aspects observed by light microscopy or immunofluorescence.

2.3. Statistical Analysis

Percentage was used for categorical data. The charts were created using Microsoft Excel 2007.

3. Results

3.1. Global Study

- **Frequency**

We examined 153 kidney biopsies out of 10,573 specimens examined, representing 1.45% of cases. The distribution per year was 17 cases (2015), 41 cases (2016), 38 cases (2017), and 57 cases (2018).

- **Age**

The average age of the patients was 33.83 years (range 14 to 67 years). The age group of 35 to 44 years was the most frequent (28%) (**Figure 1**).

- **Sex**

There were 72 men and 81 women, corresponding to a sex ratio of 0.89. **Figure 2** illustrates the breakdown by gender.

- **Occupation**

Patients were from different social sectors. Students represented 33.33% ($n = 51$), patients from the informal sector (vendors, traders, tailors, and hairdressers) 26.80% ($n = 41$), followed by patients from the private sector with 17% ($n = 26$), housewives with 9.15% ($n = 14$), patients from the public sector with 8.5%

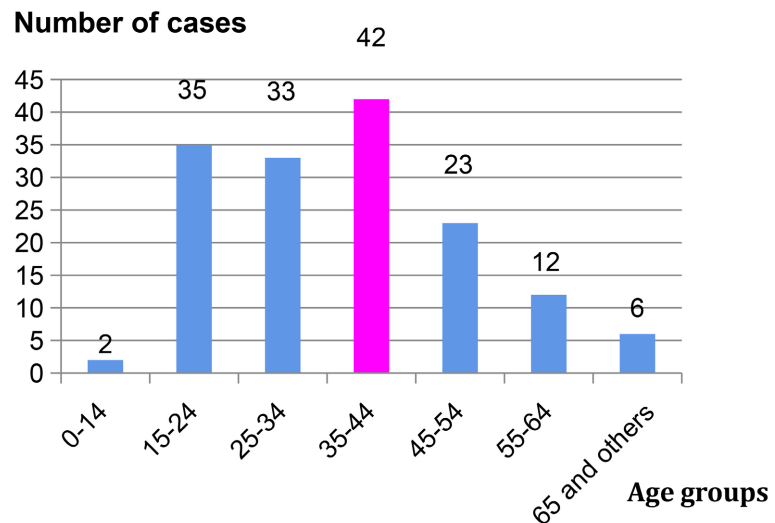


Figure 1. Distribution of renal biopsies by age group.

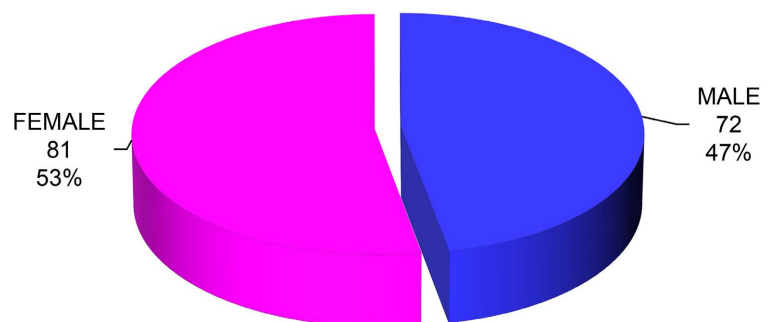


Figure 2. Distribution by gender.

(n = 13), farmers with 4.58% (n = 7), and Muslim imams with 0.65% (n = 1).

- **Origin of the biopsies**

Renal biopsies were obtained from various nephrology departments. The nephrology department of Yopougon University Teaching Hospital provided 121 renal biopsies. The others were from Sylvanus Olympio University Teaching Hospital (n = 13), Pediatric Nephrology (n = 10), University Teaching Hospital (9n = 5), Cocody-Danga Private Medical Service (n = 3), and Holy Anne Marie International Polyclinic (n = 1). The number of kidney biopsies from Ivory Coast was 91.5% (n = 140).

- **Clinical symptoms and indications for biopsy**

Clinical syndromes were nephrotic syndrome (49%) and the most common indication for renal biopsy. Acute renal failure occurred in 16.3% of cases, chronic renal failure in 19.6% of cases, chronic renal failure associated with hypertension in 11.18% of cases, and rapidly progressive glomerulonephritis in 4% of cases. Nephrotic syndromes were observed in 90.2% of cases (n = 139), and mean proteinuria ranged from 0.14 to 11.5 g/24 h with a mean of 3.03 g/24 h.

- **Histological types**

The average length of biopsy fragments analyzed by light microscopy was 9.5

mm (range, 3 to 21 mm). The number of glomeruli varied from 3 to 47 with an average of 21 glomeruli. Glomerular nephropathies accounted for 90.2% (n = 139) and isolated tubulo-interstitial lesions 9.2% (n = 14). Glomerular diseases diagnosed were HIV-associated nephropathy (26.6%; n = 37), focal segmental glomerulosclerosis (17.3%; n = 24), nephroangiosclerosis (13.6%; n = 19), post-infectious glomerulonephritis (11.5%; n = 16), membranous glomerulonephritis (9.33%; n = 13), and other glomerular damage (21.6%; n = 23). Tubulo-interstitial nephropathies were tubulo-interstitial nephritis (6 cases) and myelomatous tubulopathies (4 cases). **Table 1** shows the histological types by sex.

3.2. Characteristics of Renal Diseases

• HIV-associated nephropathy

The incidence of HIV-associated nephropathy was 24.2% of cases (n = 37). The mean age of patients was 40.3 years with a range of 26 to 67 years. The sex ratio was 0.76. The proportion of patients with HIV1 was 97.3% (n = 36). 48.65% (n = 18) of patients worked in the informal sector, 27.22% (n = 06) in the private sector, and 8.11% (n = 03) in other occupations. Clinically, HIV-associated nephropathy was defined as nephrotic syndrome in 56.8% of cases (n = 21), chronic renal failure in 18.9% of cases (n = 7), chronic renal failure associated with hypertension in 16.2% of cases (n = 6), acute renal failure in 8.1% of cases

Table 1. Distribution of histological types according to sex.

Histological types	Sex				Sex ratio
	Male		Female		
	n	%	n	%	
HIVAN	16	43.2	21	56.8	0.76
FSGS	11	45.8	13	54.2	0.85
B/MNAS	13	68.4	6	31.6	2.17
PIGN	9	56.2	7	43.7	1.28
MGN	4	30.8	9	69.2	0.44
IgAN	5	62.5	3	37.5	1.67
CGN	2	33.3	4	66.7	0.5
TID	1	16.7	5	83.3	0.2
LN	0	0	5	100	-
MCN	1	25	3	75	0.33
OTHERS	10	66.7	5	33.3	2
TOTAL	72	47.1	81	52.9	0.88

Note: HIVAN: HIV-Associated Nephropathy; FSGS: Focal Segmental Glomerulosclerosis; B/MNAS: Benin/Malignant Nephroangiosclerosis; PIGN: Post infectious Glomerulonephritis; MGN: Membranoproliferative Glomerulonephritis; IgAN: IgA Nephropathy; CGN: Crescentic Glomerulonephritis; TID: Tubulo-interstitial Disease; LN: Lupus Nephritis; MCN: Myeloma Cast Nephropathy.

(n = 3), and rapidly progressive glomerulonephritis in 4% of cases (n = 2). Mean proteinuria was 5.4 g/24h with a range of 1.5 to 11.5 g/24h. Histologically, glomerular nephropathies were detected in 94.6% of cases (n = 36): 21 cases of classic HIVAN, 9 cases of HIVAN with immunoallergic tubulo-interstitial involvement, 2 cases of minimal change disease, 2 cases of post-infectious glomerulonephritis, 1 case of membranous glomerulonephritis, and 1 case of focal segmental glomerulosclerosis. Tubulo-interstitial lesions were noted in 17 patients, including 1 case of Fanconi syndrome associated with Tenofovir. Vascular lesions were found in all patients, including 1 case of thrombotic microangiopathy (Table 2 & Table 3).

- **Non-HIV-associated focal segmental glomerulosclerosis**

Among histological types, 15.7% (n = 24) of patients had non-HIV-associated focal segmental glomerulosclerosis (non-HIV-associated FSGS). The age of patients ranged from 14 to 46 years with a mean of 25.8 years. Females predominated (54.17%) with a sex ratio of 0.85. 45.8% (n = 11) of patients were students, 33.3% (n = 8) were informal sector workers, 12.5% (n = 3) were housewives, 4.2% (n = 1) were farmers, and 4.2% (n = 1). The histological subtypes of FSGS were classic type or not otherwise specified (66.67%), collapsing type (12.5%), hypercellular type (12.5%), Spitz type (6.25%), and perihilar type (4.17%).

- **Benin/malignant nephroangiosclerosis**

Nephroangiosclerosis accounted for 12.42% (n = 19) of biopsied renal disease.

Table 2. Distribution of histological types by age.

Histological types	Age							TOTAL
	0 - 15	16 - 24	25 - 34	35 - 44	45 - 54	55 - 65	≥65	
HIVAN	-	2	9	16	7	2	1	37
FSGS	2	10	4	3	3	1	1	24
B/MNG	-	1	4	7	3	2	2	19
PIGN	-	7	2	2	3	1	1	16
MGN	-	5	2	2	2	1	1	13
IgAN	-	5	-	2	1	-	-	8
CGN	-	-	1	3	1	1	-	6
TID	-	1	2	1	1	1	-	6
LN	-	1	3	1	-	-	-	5
MCN	-	-	-	1	2	1	-	4
OTHERS	-	3	6	4	-	2	-	15
TOTAL	2	35	33	42	23	12	6	153
PERCENTAGE	1.3	22.9	21.6	27.4	15	7.8	3.9	100

Note: The others were consisted of 5 cases of acute tubular necrosis, 3 cases of minimal change disease, 2 cases of thrombotic microangiopathy, 2 cases of Membranoproliferative glomerulonephritis, 1 case of diabetic nephropathy, 1 case of cytomegalovirus nephritis, and 1 case of amyloidosis.

Table 3. Distribution of HIV associated nephropathy according to epidemic ological and pathological aspects.

Parameters	HIV associated Nephropathy	
	Effective	Percentage
SEX		
Male	16	43.24%
Female	21	56.76%
AGE (years)		
0 - 14	-	-
15 - 64	36	97.3
≥65	1	2.7
VIH		
VIH 1	36	97.3
VIH 2	1	2.7
OCCUPATIONS		
Informal sector	18	48.7
Private sector	6	16.2
Public sector	3	8.1
Others	10	27
INDICATIONS		
Nephrotic syndrom	21	56.8
Acute kidney injury	3	8.1
Chronic kidney disease	7	18.9
Chronic kidney disease + Hypertensive nephrosclerosis	5	13.5
Rapidly progressive glomerulonephritis	1	2.7
NOSOLOGY		
HIVAN	22	59.5
Immunoallergic Nephritis	9	24.3
Minimal change Disease	2	5.4
Post-infectious GN	2	5.4
Membranoproliferative Glomerulonephritis	1	2.7

The mean age of patients was 39 years (range: 23 - 56 years). 68.42% (n = 13) of patients were male. Of the patients with Benin/malignant nephroangiosclerosis, 5 cases (26.3%) were students, 5 cases (26.3%) were in the informal sector, 4 cases (21%) were in the private sector, 3 cases (15.8%) were in the public sector, 1 case (5.3%) was a Muslim imam, and 1 case (5.3%) was a farmer. Malignant nephroangiosclerosis accounted for 63.2% (n = 12) of total hypertensive kidney

disease.

- **Post-infectious glomerulonephritis**

With a frequency of 10.5% of cases, post-infectious glomerulonephritis occurred in patients with a mean age of 32.89 years (extreme values: 17- 59 years). The sex ratio was 1.28. Students (56.25%, n = 9) were most commonly affected, followed by informal sector workers (25%), civil servants (12.5%), and farmers (6.25%). Histologically, chronic infectious lesions were predominant in 75% of cases. No specific lesion was found.

- **Membranous glomerulonephritis**

The proportion of patients with membranous glomerulonephritis was 8.5% (n = 13). The mean age was 26.73 years (extreme values: 16- 49 years). The sex ratio was 0.44. 61.54% (n = 8) of cases were students, and 38.46% (n = 5) belonged to other professional groups. Type I - II of membranous glomerulonephritis, type I and type III were 84.62%, 7.69% and 7.69% of cases, respectively.

- **Other pathologies**

The other diagnosed diseases accounted for 21.6% of cases (n = 23), with IgA nephropathy (n = 8) predominating, followed by Crescent glomerulonephritis (n = 6).

4. Discussion

Diseases of aging are one of the most common non-communicable diseases in the world today. These diseases increase over the years with human social development and environmental diseases such as diabetes, HTA, obesity and infections [11]. In sub-Saharan Africa, few studies on rare diseases are mentioned in the literature [2] [15]. The present study was conducted in a resource-limited country, Côte d'Ivoire, in sub-Saharan Africa.

Our data showed a low prevalence of renal and graft disease in the department's activity. Biopsies examined during the study period were generally from women. Our results differ from those of Das *et al.* ref. [19] in India, who found a male preponderance. In our study, female obesity may be related to the prevalence of HIV-associated nephropathy, non-HIV FSGS, and membranous glomerulonephritis. These three conditions are frequently observed in a young female population coming from underprivileged backgrounds where impoverishment, promiscuity, and unscrupulousness coexist.

HIV is the main risk and severity factor for one in four patients in our study. The biopsies examined in our study came from a variety of sources. Most biopsies were from the university hospitals of Abidjan in Ivory Coast, and only a few were from Togo. Other countries such as Burkina Faso, Guinea, Mali, and Niger are also interested in the practice of renal biopsy to increase our expertise in renal pathology. This underscores the importance of pathologic examination in the therapeutic management and prognostic assessment of nephrologic disease. In our series, nephrotic syndrome (49%) was the most common symptom or the main indication for renal biopsy, as described by several authors worldwide, ref.

[19] [20], while some studies have found a high incidence of tubulo-interstitial nephritis, ref. [21] [22]. These variations could be related to environmental and familial factors. Occupationally, the least favored members of our study population, high school and college students, were affected by renal pathology. The causes could be related to infectious diseases, including HIV, alcohol, tobacco, hypertension, and unknown genetic diseases. Histologically, several diseases such as HIV-associated nephropathy, focal segmental glomerulosclerosis, nephroangiosclerosis, and other pathologies have been diagnosed. HIV-associated nephropathy is a common complication of HIV, accounting for 3.5% to 48.5% of cases, ref. [23]. In our study, it was the most common cause of renal biopsy, accounting for 24.2% of cases and resulting in high proteinuria. The majority of people with HIV-associated nephropathy were young women working in the informal sector. In our current study, classic HIVAN was predominant. It is characterized by a drop in the flocculus to the vascular pole, microcystic dilatation of the tubules, and interstitial inflammation, ref. [24]. Classic HIVAN is also found in 3.5% - 10% of HIV-infected African Americans, ref. [24]. However, our result shows a high proportion of classical HIVAN with 78% of cases. Our result differs from that of Cisse *et al.* ref. [25] from Senegal, who reported a low incidence of 16% in 20 histologically confirmed patients. The high proteinuria reflects the severity of renal involvement in HIV patients in our country. The incidence of immune complex nephropathies due to HIV infection is low. These immune complex forms are prevalent in European and Asian countries, while they are rare in patients from Africa, ref. [26] [27] [28], as also observed in our study.

Other conditions, such as tubulo-interstitial nephropathy, vascular nephropathy, and toxic nephropathy (Tenofovir toxicity), have been reported. The causes of renal toxicity could not be determined in some cases. In fact, patients exposed to the side effects of medicinal plants were identified in our study. The occurrence of chronic renal failure during HIV infection is mediated by viral, genetic, and environmental factors. Direct infection of renal cells leads to clinical disorders (proteinuria and disease progression) and histological lesions (collapsing glomerulopathy and tubular lesion). The recent discovery of the APOL1 gene on chromosome 22 and its variants has shown that it is involved in the occurrence of HIVAN, ref. [26]. FSGS, which is not related to HIV, was common in our study and mainly affected young patients with nephrotic syndrome. FSGS was common in Africans and South Americans due to the high rate of APOL1 gene in this population and infectious diseases. Microscopically, FSGS showed segmental and focal hyaline deposits associated with flocculo-capsular fibrosis, synechia, and podocytosis. The common FSGS subtype was most prevalent in our study. Recent studies have highlighted the role of glomerular basement membrane podocyte proteins and signaling receptors in the development of the disease, ref. [29]. The high proportion of children and adolescents in our study could be investigated by genetic studies for efficient clinical management. Moreover, glomerular lesions associated with podocyte pathology were less fre-

quent in our series than in Asian countries (Japan, India, and Korea), where they are the main cause of nephropathy, ref. [19]. The frequency of benign and malignant nephroangiosclerosis is due to the high prevalence of hypertension and its concomitants in our country. It affected young people who consumed alcohol and tobacco. This disease was found in the large vascular trunks, arterioles, and glomeruli. However, it is rare in Asian and European studies, ref. [19]. With a frequency of 11.6% of cases, post-infectious glomerulonephritis occupies an important place in renal pathology. Post-infectious glomerulonephritis occurs frequently in young patients with bacterial, parasitic, viral, and mycotic diseases in most sub-Saharan African countries. In Europe and North America, post-infectious glomerulonephritis has virtually disappeared due to the use of effective targeted antibiotic therapy, ref. [19]. Common membranous glomerulonephritis is nephropathy related to an infectious and dysimmune context. This disease was diagnosed in all age groups of our study population. The main risk factors are viral infections (hepatitis B virus or HIV), liver cirrhosis, chronic inflammatory diseases (rheumatoid arthritis), and tumors, ref. [29]. Further studies with a large cohort would help clarify the causes of these regular and homogeneous membranous IgG deposits. The absence of subclasses in the antibody panel did not allow us to make such an observation. It is the third most common renal disease after focal segmental glomerulosclerosis and minimal glomerular lesion in Brazil, ref. [21]. IgA-dependent nephropathy is not very common in our context. All our cases were diagnosed by an immunofluorescence study. The lesions observed in IgA depot nephropathy were very characteristic. They appeared in the form of IgA deposits in the mesangial axes and occasionally in the walls of some vessels. It frequently affects adolescents, as reported in larger series from European and American countries, where it is the main cause of glomerular nephropathy. IgA-dependent nephropathy frequently affects adolescents, as reported in larger series from European and American countries, where it is the main cause of glomerular nephropathies, ref. [24] [26]. The other causes of renal failure were rare in our study. Sickle-shaped glomerulonephritis was primarily related to lupus nephropathy, ANCA vasculitis, and rheumatoid purpura. Crescentic glomerulonephritis was common in young women in our study population. Membranoproliferative glomerulonephritis was seen in two patients, in one lupus patient, and in one patient with viral hepatitis C associated with cryoglobulinemia. One case of renal amyloidosis was observed in a patient with chronic inflammatory rheumatism and tuberculosis. Tubulo-interstitial nephritis was essentially caused by drugs and cancer. Deposits of Ig light chains were observed in tubule cells or in the lumen of tubules without any association with amyloidosis or other glomerulopathies with monoclonal Ig deposits. Regarding the graft unit, graft biopsies are less frequent. Transplant biopsies are less frequent in the transplant unit because patients are often referred to well-equipped hospitals in Europe and North Africa. Two graft biopsies were performed: one in a patient with acute tubular necrosis and the other in a patient with cytomegalovirus nephritis.

The biases and limitations were related to demographics, geographic characteristics, and biopsy indications in our country. Informed consent is required from patients for biologic and immunologic tests, radiologic examinations, and the cost of performing renal biopsies. In addition, the cost of the needle, ultrasound, and various biological and pathological tests were borne by the patient. However, these difficulties can be ameliorated by appropriate disease prevention and screening programs in our country and in the East African region.

5. Conclusion

Renal biopsy is an important procedure for better treatment strategies in patients with renal and transplant diseases. Glomerular nephropathies are the most common kidney diseases on Ivory Coast. Glomerular nephropathies mainly affect young people and are dominated by HIV-associated nephropathy and focal segmental glomerulosclerosis. Difficulties in the management of renal disease hinder the performance and sustainability of biopsies in our country. Complete management of the performance and interpretation of renal biopsies would be an undeniable advantage for the efficient care of renal or transplant pathologies in our country.

Conflicts of Interest

The authors declare that they have no competing interests.

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