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Idiopathic Adult Nephrotic Syndrome: A Clinicopathological Study and Response to Steroid in a Sub-Saharan African Country

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Abstract

Introduction: Idiopathic nephrotic syndrome represents 25% to 30% of glomerulonephritis in adults. These glomerulonephritides are responsible of about the half of chronic kidney failure examined as well in United States as in Europe or Africa. The aim of this study was to determine the anatomoclinic, therapeutic and progression patterns of idiopathic nephritic syndrome in Dakar. Patients and Methods: It is a retrospective ten-year study in the nephrology department of Aristide Le Dantec Hospital. Patients with idiopathic nephrotic syndrome were included. We analyzed anatomoclinic, therapeutic and progression data of idiopathic nephrotic syndrome. Results: On 202 patients with nephrotic syndrome, 156 (77%) were primitive. The mean age was 29.7 ± 12 years with a sex ratio of 2.4. Edema was found in 98 patients (62.8%) and hypertension in 63 patients (40%). The mean proteinuria was 6.8 ± 4.8 g/24h. Histologic lesions found at renal biopsy were focal segmental glomerulosclerosis in 71 patients (45.5%), minimal change disease in 68 patients (43.5%) and membranous nephropathy in 8 patients (5%). 134 patients (85.8%) received steroids alone, 12 patients (7.6%) received cyclophosphamide and 4 patients (2.5%) azathioprine in association with steroids. 44 patients (28.2%) reached remission. The factors of poor prognosis were: age, above 40 years, proteinuria above 10 g/24h, existence of renal failure at admission, absence of use of steroids therapy. Conclusion: This study shows that idiopathic nephrotic syndrome is frequent in our country with a prevalence of 77%. The most common lesion found at the renal biopsy is the focal segmental glomerulosclerosis. Remission is found only in 28% which is very low. 33% of patients progress towards chronic kidney disease due to the lack of early diagnosis and the use of traditional medicine.

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Keywords

Idiopathic Nephrotic Syndrome, Focal Segmental Glomerulosclerosis, Minimal Change Disease, Membranous Glomerulonephritis

1. Introduction

Idiopathic nephrotic syndrome (NS) is determined by a proteinuria higher than 3 g/24 hours associated with hypoalbuminemia, with no kidney inflammatory lesions or immune complex deposits. It is a clinical translation of a podocyte injury and represents 25% to 30% of glomerulonephritis in adults [1]. It constitutes the most recurrent revelation of about 50% of chronic kidney diseases observed as well in the United States, in Europe or in Africa [2]. Renal biopsy is mandatory in the identification and the characterization of lesions [3]. It also enables planning of therapeutic strategies and establishes a prognosis. The aim of this study was to determine the epidemiological, clinico-biological, histological, therapeutic and progression profiles of idiopathic NS in Dakar.

2. Patients and Methods

It is about a retrospective study in the nephrology department at Aristide Le Dantec University Hospital (level 3) during the period of January 2001 to December 2010. We included all patients off if teen years of age and above who consulted during this period for NS of which no secondary cause was found. For each included patient, epidemiological, clinical, biological and histological data were collected. Therapeutics used was classified in symptomatic and curative treatment. Evolution was favorable towards spontaneous remission, complete or partial, or unfavorable marked by absence of remission (relapse, steroid resistance or steroid dependence) and by the occurrence of complications related to NS and the treatment.

Idiopathic nephritic syndrome was define as a proteinuria higher than 3 g/24h, a serum albuminemia less than 30 g/l, a serum protidemia less than 60 g/l and which no secondary cause was found.

The local ethics committee approved the study.

Statistical analyses:

Data collected were entered through an electronic questionnaire elaborated by Epi Info 3.3.2 version. Analysis plan was as follows:

- Descriptive study of different variables was carried out by calculating the proportions for the variables of each category, and the positional and dispersion parameters for quantitative variables;
- Bivariate analysis was made using the chi2 test for comparisons of proportions, student's test for comparison of mean and logistic regression. The difference was considered statistically significant at a $p < 0.05$.

3. Results

During the study period, 3773 patients were consulted. 251 medical records were collected and 49 were excluded for incomplete medical file. One hundred and fifty-six (156) out of two hundred and two (202) patients presented aidiopathic nephrotic syndrome (77%). The mean age was 29.7 ± 12 years. The age group of 15 - 25 years was the most representative with 46% of patients. Men represented 72% (112) versus 28% of women (44) with a sex ratio of 2.4 (**Table 1**). Edema was the most frequent type of presentation found in 98 patients (63%). It was associated with ascites and hydrothorax in 24 patients (15.3%). Hypertension was found in 63 patients (40%) (**Table 1**).

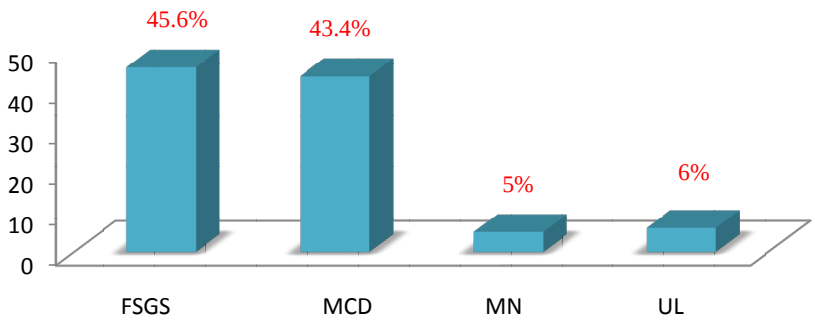
The mean serum protein was 48.5 g/l ± 6.8 g/l and the mean serum albumin was 20 g/l ± 10 g/l. 50% of patients presented a serum albumin level lower than 20 g/l. Hypertriglyceridemia was present in 82 patients (52.5%). The mean proteinuria was 6.8 g/24h ± 4.8 g/24h **(Table 1)**. A microscopic hematuria was noted in 13 patients and a leukocyturia in 15 patients.

At renal biopsy, focal segmental glomerulosclerosis (FSGS) was found in 71 patients (45.6%), minimal change disease (MCD) in 68 patients (43.3%) and membranous nephropathy (MN) in 8 patients (5%) (**Figure 1**).

For management of the nephrotic syndrome, lifestyle measures were adopted: sufficient caloric diet in all patients, fluid restriction in 21 patients (13.4%), sodium restriction diet in148 patients (95%) and a low

Table 1. Baseline clinical and laboratory details of the patients.

	Total patients (n = 156)
Mean age (ans)	29.7 ± 12 years
Men	72% (n = 112)
Women	28% (n = 44)
Oedema	63% (n = 98)
Hypertension	40% (n = 62)
Mean serum protein	48.5 ± 6.8g/l
Mean serum albumin	20 ± 10 g/l
Mean proteinuria	6.8 ± 4.6 g/24h
Renal insufficiency	44% (n = 68)
Hypertriglyceridemia	52.5% (n = 82)
Complete remission	23.7% (n = 37)
Partial remission	4.45% (n = 7)
Relapse	5.1% (n = 8)
Steroid dependent	4.45% (n = 7)
Steroid resistant	6.43% (n = 10)



FSGS: focal segmental glomerulosclerosis, MCD: minimal change disease, MN: membranous nephropathy, UL: unclassificable lesion

Figure 1. Frequencies of the primary glomerular diseases.

potassium diet in 9patients (5.7%). Diuretics were used in 141 patients (91.5%). Furosemide is used alone in 133 patients (85.2%) and associated to aldosterone blocker in 15 patients (9.6%) and to hydrochlorothiazide in 13 patients (8.4%). Antiprotein uric agents were used in 67 patients (43%). All of those patients were on angiotensin-converting enzyme inhibitor (ACE-inhibitors). Anticoagulation was done in 13 patients (8.4%) for treatment and prevention of thrombotic event. One hundred thirty-four patients (85.8%) received steroids at the dose of 1 mg/kg/day of prednisone. Median duration of high-dose steroids was 1.5 month. Cyclophosphamide was used in 12 patients (7.6%), azathioprine in 4 patients (2.5%) after two month of steroid therapy without remission (**Table 1**).

Remissions were noted in 44 patients (28.1%). The absence of remission was noted in 23 patients (14.8%). Relapse was found in 8 patients (5.1%) with a mean of two relapses. Steroid dependence was found in 7 patients (4.45%) and steroid resistance in 10 patients (6.45%) (**Table 1**).

4. Discussion

The prevalence of idiopathic NS was 77%. This prevalence was relatively similar to those found in the USA where Swaminathan [3] found 72% of primitive SN. However, they were discordant with those of Deme [4] and of Akpechi [5] in South Africa who found respectively 12% and 41.2% of idiopathic NS in their study. In our

series, the idiopathic nephrotic syndrome was much more common in young adults with a mean age of 29 years. The age group of 15 - 25 years was the most representative with 46.5%. These results were similar to those found in the study of Deme [4] where the age group of 25 - 34 years was the most representative with 37.8%. These results are also in line with those of Kaba [6] and Abdoulaye [7] where the mean age was respectively 26.2 and 25 years. The young age of the patients in these studies reflected the youthful nature of the population in developing countries in general and Africa in particular.

On histology FSGS was found in 45.6%, MCD in 43.4%, MN in 5%. Five patients presented unclassifiable histological lesions. In the study of Deme [4], FSGS was 75%, the MCD 12%, MN 6%. This percentage difference on FSGS between our study and that of Deme may reflect selection bias of renal biopsy before 2008. Indeed, before 2008 the kidney biopsies were done only in steroid dependent or steroid resistant patients because of the absence of a renal pathologist in Dakar. However, since 2008 the kidney biopsy became systematic in adults due to the presence of a renal pathologist in the department. Kaba [6] has also found the FSGS in 40%, MCD in 35%, and MN in 5%. In 15% the lesion was undetermined. Idiopathic FSGS represents about 5% to 15% of adult's glomerulonephritis in the world. It is more common in black population. Recently, genes of "kidney susceptibility" were found. This showed that some variants of MYH9 gene, although nonpathogenic, play an important role in the development of idiopathic FSGS in the African American [8] population. This could explain the fact that the FSGS is the leading cause of primitive NS in adult black Africa. In our study, 130 patients (66%) received steroids. In Abdoulaye's study [7], steroids had been used in 93.85%. Deme [4] found 72.5% patients receiving steroid in its series. Cyclophosphamide was used in 6 patients (7.9%). Deme [4] in his study found 33 patients on cyclophosphamide.

In our study the progression was favorable with remission in 57 patients (28.21%). Eight patients relapsed, 7 presented had steroid dependence, 10 were resistant to immunosuppressive and steroid treatment. The progress towards chronic kidney disease was noted in 33%. The high rate of chronic kidney failure is explained by the fact that most patients come late to specialists. They turned first to traditional medicines where renal toxicity of drug is most often incriminated as additive precipitating factor to chronic kidney disease. In a study of 115 biopsies, 11% had a second nephrotoxicity of traditional medicines [9].

5. Conclusion

This study shows that idiopathic nephrotic syndrome is frequent in our country with a prevalence of 77%. The most common lesion found at the renal biopsy is the FSGS. Remission was found only in 28% which is very low. 33% of patients progress to chronic kidney disease by lack of early diagnosis and the use of traditional medicine.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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