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Anatomoclinical Correlation In Black Patients With Lupus Nephritis Living In Senegal

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Abstract

Introduction: This study was conducted to search clinico-histological correlation during lupus nephritis.

Patients and method: it was a retrospective and analytical study, conducted over a period of 10 years from 01 January 2007 to 31 December 2016 in the nephrology department of Aristide Le Dantec Hospital in Dakar. Histological parameters were crossed over with demographic, clinical and biological data to search for clinico-biological and histological correlation.

Results: In a total of 93 black patients with lupus, 64 were included, giving a hospital prevalence of 69%. The mean age of the patients was 31.97 ± 10.44 years old. There were 81% women and 19% men with a sex ratio of 0.23. The existence of hypertension and renal failure was correlated with the presence of a proliferative class. Interstitial fibrosis was correlated with renal failure. A statistically significant correlation was found between the presence of interstitial infiltration and the existence of renal failure and leukocyturia. Fibrous endarteritis was correlated with renal failure and hypertension. Arteriosclerosis was associated with hypertension.

Bproliferative classes, interstitial fibrosis, interstitial infiltration and chronic vascular lesions were correlated with severe clinico-biological manifestations. Multicentric studies are needed to support these results.

Keywords: Correlation; Anatomoclinical; Lupus nephritis; Senegal;

Introduction

Kidney injury is one of the most severe manifestations of systemic lupus erythematosus (SLE), affecting 40-60% of SLE patients. [1, 2] Two previous studies in Senegal reported a hospital prevalence of 56% and 72%.[3, 4]The risk of progression to end stage renal disease is relatively low in all randomized studies published in recent years, estimated at less than 10% of patients after a follow-up of 5 to 10 years. [5] However, broader epidemiological studies reveal a greater risk when one approaches the usual clinical practice, ranging from 19% in the Caucasian patients to 69% in the black patients [5]. As for the vital prognosis of lupus patients, it is strongly influenced by the existence or not of lupus nephritis. In a large European cohort [6], it was shown that the overall survival, measured at 10 years of the diagnosis of lupus, was 94% for patients without lupus nephritis against 88% for the patients with lupus nephritis [7]. The existence of a clinico-histological correlation is not clearly established during lupus nephritis by previous studies [8]. However the most severe clinical and biological manifestations are generally observed in proliferative classes [9].

To our knowledge, no study has been done on the clinico-histological correlation in patients with lupus nephritis in a nephrology department in Senegal. This study was conducted to look for clinico-histological correlation during lupus nephritis.

Patients and method

This was a retrospective and analytical study conducted over a period of 10 years from January 1, 2007 to December 31, 2016, in the nephrology department of Aristide-Le-Dantec University Hospital in Dakar. All patients with lupus nephritis were included. The diagnosis of lupus nephritis was retained in the presence of concordant renal biopsy with proteinuria greater than 0.5 g / 24h or active urinary sediment [8]. For each selected patient, epidemiological, clinical, biological, histological, therapeutic and progression data were studied. The glomerular filtration rate (GFR) was estimated according to the MDRD (The Modification of Diet in Renal Disease) formula. Histological lesions were established on the basis of the ISN / RNP classification of 2003. Histological parameters were crossed over with demographic, clinical, and biological data in order to search for clinico-biological and histological correlation.

The data entry was made using the software “The sphinx” version 5.1.0.2

The analysis of the data was done using SPSS (Statistical Package for Social Science) software version 18. The averages and percentages were compared using the Student's test and the Chi-square test, and the exact test of Fischer, according to their conditions of applicability.

Any difference below 0.05 was considered statistically significant.

Results

In a total of 93 black patients with lupus, 64 patients were included, with a hospital prevalence of 69%. The mean age of the patients was 31.97 ± 10.44 years. There were 52 women (81%) and 12 men (19%) with a sex ratio of 0.23. The mean time between onset of symptomatology and admission was 14.86 ± 17.76 weeks. Edema was the main reason for consultation, found in 57.68% of cases. Oliguria was found in 2 patients and anuria in 1 patient. Hypertension was found in 34.3% of patients. Mean serum creatinine was 19.27 mg / L ± 20.72 and renal failure was present in 34.5% of patients. Mean proteinuria was 3.99 g / d ± 3.09. Nephrotic syndrome was found in 71.90% of cases. The C3 and CH50 hypocomplementemia were noted in 2 patients and the C4 fraction was normal in all patients. Antinuclear antibodies were assayed in 15 patients and positive in all patients. Anti-ENA was positive in 92.59% of cases and was anti-Sm in 72% of cases. Native anti-DNA antibodies were positive in 43.47% of cases. Class III was found in 24 cases (37.5%), class IV in 20 cases (31.25%), class V in 15 cases (23.4%), class II in 4 cases (6.25%) and class I in 1 case (1.6%). The most frequent associated vascular lesions were fibrous endarteritis in 31.3% of cases and arteriosclerosis in 23.4% of cases. The most frequent associated tubulointerstitial lesions were interstitial fibrosis in 43.8% of cases, tubular atrophy in 31.25% of cases and interstitial lymphocyte infiltration in 28.1% of cases. Hypertension and renal failure were correlated with the presence of a proliferative class (Table 1). Interstitial fibrosis was correlated with renal failure (Table 2). A statistically significant correlation was found between the presence of interstitial infiltration and renal failure and leukocyturia (Table 3). Fibrous endarteritis was correlated with the presence of hypertension and renal failure (Table 4). Arteriosclerosis was associated with hypertension (Table 5).

Table 1: Clinical-Biological Correlation With Histological Class.

	Proliferative class	Without proliferative class	P
	(n=44)	(n=20)	
Age	31.19±8.1	30.7±7.4	0.74
Sex-ratio	11M/33F	1M/19F	0.28
Hypertension	21cas (47.72%)	1 cas (5%)	0.02
Mean serum creatinine	22.3±12.5	12±6.9	0.16
Renal insufficiency	20 cas (45.45%)	2 cas (10%)	0.04
Anemia	39 cas (88.63%)	15 cas (75%)	0.66
Lymphopenia	7 cas (15.90%)	1 cas (5%)	0.58
C3 Hypocomplementemia	2 cas (4.54%)	0 cas (0%)	0.81
CH50 Hypocomplementemia	2 cas (4.54%)	0 cas (0%)	0.81
Anti-ENA antibodies	17 cas (38.63%)	8 cas (40%)	0.09
Anti-dsDNA antibodies	8 cas (18.18%)	2 cas (10%)	0.07
Mean proteinuria	3.55±2.7	1.86±1.78	0.38
Nephrotic syndrome	24 cas (54.54%)	11 cas (55%)	0.08
Microscopic hematuria	17 cas (38.63%)	6 cas (30%)	0.09
Leukocyturia	15 cas (34.09%)	5 cas (20%)	0.83

Table 2: clinical-biological correlation with interstitial fibrosis.

	Fibrous interstitial (n=19)	Without Fibrous interstitial (n=45)	P
Age	34.01±8.31	31.81±9.75	0.53
Sex-ratio	5M/14F	7M/38F	0.63
Hypertension	4 cas (21.05%)	18 cas (40%)	0.15
Mean serum creatinine	22.61±11.64	19.51±9.55	0.08
Renal insufficiency	15 cas (78.94%)	7 cas (15.55%)	0.04
Anemia	17 cas (89.47%)	37 cas (82.22%)	0.11
Lymphopenia	3 cas (15.78%)	5 cas (11.11%)	0.23
C3 Hypocomplementemia	2 cas (10.52%)	0 cas (0%)	0.09
CH50 Hypocomplementemia	2 cas (10.52%)	0 cas (0%)	0.09
Anti-ENA antibodies	8 cas (42.10%)	17 cas (37.78%)	0.41
Anti-dsDNA antibodies	3 cas (15.78%)	7 cas (15.55%)	0.45
Mean proteinuria	3.24±2.15	3,65±2.94	0.32
Nephrotic syndrome	11 cas (57.75%)	24 cas (53.33%)	0.18
Microscopic hematuria	5 cas (26.31%)	18 cas (40%)	0.24
Leukocyturia	6 cas (31.57%)	14 cas (31.11%)	0.33

Table 3: clinical-biological correlation with interstitial infiltration.

	Interstitial infiltration (n=18)	Without Interstitial infiltration (n=46)	P
Age	33.21±6.14	30.51±7.81	0.47
Sex-ratio	2M/16F	10M/36F	0.98
Hypertension	5 cas (27.78%)	17 cas (36.95%)	0.22
Mean serum creatinine	23.7±9.75	18.75±6.45	0.1
Renal insufficiency	15 cas (83.33%)	7cas (15.21 %)	0.03
Anemia	15 cas (83.33%)	39 cas (84.78%)	0.87
Lymphopenia	2 cas (11.11%)	6 cas (13.04%)	0.25
C3 Hypocomplementemia	0 cas (0%)	2 cas (4.34%)	0.59
CH50 Hypocomplementemia	0 cas (0%)	2 cas (4.34%)	0.59
Anti-ENA antibodies	4 cas (22.2%)	21 cas (45.65%)	0.87
Anti-dsDNA antibodies	1 cas (5.55%)	9 cas (19.56%)	0.16
Mean proteinuria	2.94±2.41	3.25±2.81	0.21
Nephrotic syndrome	8 cas (44.44%)	27 cas (58.69%)	0.4
Microscopic hematuria	5 cas (27.78%)	17 cas (36.95%)	0.37
Leukocyturia	16 cas (88.89%)	4 cas (8.69%)	0.02

Table 4: clinical-biological correlation with histological fibrous endarteritis

	Fibrous endarteritis (n=20)	**Without fibrous endarteritis (n=44)**	**P**
Age	34.24±7.35	32.01±6.54	0.59
Sex-ratio	3M/17F	9M/35F	0.62
Hypertension	14 cas (70%)	8 cas (17.02%)	0.03
Mean serum creatinine	19.61±10.00	22.64±10.81	0.13
Renal insufficiency	16 cas (80%)	6 cas (13.63%)	0.02
Anemia	15 cas (75%)	39 cas (88.63%)	0.49
Lymphopenia	5 cas (25%)	3 cas (6.81%)	0.97
C3 Hypocomplementemia	1 cas (5%)	1 cas (2.27%)	0.22
CH50 Hypocomplementemia	1 cas (5%)	1 cas (2.27%)	0.22
Anti-ENA antibodies	11 cas (55%)	14 cas (31.81%)	0.86
Anti-dsDNA antibodies	2 cas (10%)	8 cas (18.18%)	0.71
Mean proteinuria	2.84±2.66	3.41±2.71	0.62
Nephrotic syndrome	10 cas (50%)	25 cas (56.81%)	0.14
Microscopic hematuria	7 cas (35%)	16 cas (36.36%)	0.85
Leukocyturia	7 cas (35%)	13 cas (29.54%)	0.36

Table 5: Clinical-Biological Correlation With Arteriosclerosis

	Arteriosclerosis (n=15)	Without Arteriosclerosis (n=49)	P
Age	34.24±6.31	31.71±8.95	0.07
Sex-ratio	2M/13F	10M/39F	0.36
Hypertension	14 cas (93.33%)	8 cas (16.32%)	0.01
Mean serum creatinine	19.41±8.55	22.44±9.81	0.48
Renal insufficiency	7 cas (46.66%)	15 cas (30.61%)	0.65
Anemia	12 cas (80.04%)	42 cas (85.71%)	0.59
Lymphopenia	3 cas (20%)	5 cas (10.20%)	0.87
C3 Hypocomplementemia	1 cas (6.67%)	1 cas (2.41%)	0.29
CH50 Hypocomplementemia	1 cas (6.67%)	1 cas (2.04%)	0.29
Anti-ENA antibodies	5 cas (33.33%)	20 cas (40.81%)	0.69
Anti-dsDNA antibodies	0 cas (0%)	8 cas (16.32%)	0.95
Mean proteinuria	2.72±2.11	3.61±3.15	0.28
Nephrotic syndrome	8 cas (53.36%)	27 cas (55.10%)	0.15
Microscopic hematuria	3 cas (20%)	20 cas (40.81%)	0.85
Leukocyturia	3 cas (20%)	17 cas (34.69%)	0.69

Discussion

In our study, the existence of hypertension and renal failure was correlated with the presence of proliferative class. Al-Zabrani and Hurtado found a correlation between renal failure and the existence of a proliferative class [10, 11]. Okpechi et al also found a correlation between hypertension and the existence of a proliferative class [12]. These results could be explained by the fact that cellular proliferation entrains a decrease of glomerular filtration which will cause renal insufficiency and a decrease of the diuresis. Hypertension would be volo-dependent in relation to sodium-water retention entrained by a decrease of diuresis and oncotic pressure.

Interstitial fibrosis was correlated with renal failure. This correlation of interstitial fibrosis with renal failure could be explained by the fact that it reflects a renal damage already evolved. A statistically significant correlation was found between the presence of interstitial infiltration and renal failure and leukocyturia. Gassongo-Koumou and Alsuwaida found a correlation between interstitial infiltration and renal failure [13, 14]. For Hsieh and Hill, interstitial infiltration is a histological parameter strongly correlated with serum creatinine [14]. In proliferative form, the presence of interstitial infiltration may have a significant effect on treatment response as well as renal prognosis [14]. Hsieh and Yu discovered that interstitial infiltration is a parameter that can predict renal survival [14]. All of this means that today the ISN / RNP classification needs to be updated to include tubulointerstitial lesions. It is also important to use immunohistochemistry to evaluate the degree of tubulointerstitial inflammation as it is better able to detect moderate or minimal tubulointerstitial inflammation than the usual hematoxylin-eosin staining techniques or with periodic acid Schiff [15]. In our series, we noted a high frequency of tubulo-interstitial inflammation which suggests a possible participation of environmental factors such as herbal medicine but also genetic factors. Indeed, other studies have found a higher incidence of tubulointerstitial inflammation in Afro-americans [15, 16].

Fibrous endarteritis was correlated with the existence of hypertension and renal failure. Hypertension was associated with arteriosclerosis. This correlation of chronic vascular lesions with hypertension was found in other series by Gassongo-Koumou and Descombes [17, 18]. This correlation is explained by the fact that fibrous endarteritis and arteriosclerosis are repercussions renal hypertension. This makes hypertension a factor in the progression of kidney disease. Therefore, it is important to control the blood pressure by the antagonists of the renin angiotensin aldosterone system during lupus nephritis.

Conclusion

In this work, proliferative classes, interstitial fibrosis, interstitial infiltration and chronic vascular lesions were found to be correlated with severe clinico-biological manifestations. Multicentric studies are needed to support these results.

Ethical statement

The local ethics committee approved the study.

Informed consent

This research involve human participant, they have signed the informed consent.

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