Original Article

Clinicopathological Features and Predictors of Lupus Nephritis Patients — A Study in a Tertiary Care Hospital in Bangladesh

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ABSTRACT

Introduction: *Lupus nephritis (LN) represents a severe manifestation of systemic lupus erythematosus, and its clinicopathological findings significantly impact the overall disease prognosis. Unfortunately, there is a scarcity of data on lupus nephritis (LN) in Bangladeshi patients in the existing literature.* ***Aim of the study:*** *This study aimed to assess the clinicopathological features and predictors of lupus nephritis patients in Bangladesh.* ***Methods and materials:*** *This cross-sectional study was conducted at the Department of Sir Salimullah Medical College Mitford Hospital, Dhaka, Bangladesh from January 2023 to July 2023. The study included a total of 30 lupus nephritis patients, selected through purposive sampling. All data were analyzed by using the SPSS version 23.0 program.* ***Results:*** *In this study, the majority of participants (53%) belonged to the ≤24 years age group, with 77% being female. Regarding the classification of lupus nephritis according to the*

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International Society of Nephrology/Renal Pathology Society (ISN/RPS), the majority (53%) fell into class IV. Remarkably, all of our participants (100%) exhibited a SLEDAI 2K score of ≥20. ***Conclusion:*** *Among the Bangladeshi population, lupus nephritis is more prevalent in younger individuals and females. In the majority of lupus nephritis cases, ISN/RPS score IV is observed, and there is a higher frequency of having a SLEDAI 2K score of ≥20. In addition to the ISN/RPS score, SLEDAI 2K scores can be regarded as another reliable diagnostic tool for evaluating lupus nephritis.*

Keywords: *Lupus Nephritis, LN, Systemic lupus erythematosus, SLEDAI 2K score, ISN/RPS classification*

INTRODUCTION

Lupus nephritis (LN), a severe manifestation of systemic lupus erythematosus (SLE), affects approximately 40 to 50% of SLE patients. It encompasses a spectrum from silent nephritis (subclinical illness) to end-stage renal disease (terminal illness). Recent studies indicate a 5- and 15-year risk of end-stage renal disease (ESRD) at 11% and 22%, respectively, with 10-30% of LN patients progressing to kidney failure requiring renal replacement therapy, particularly in cases of proliferative LN [1,2]. The clinical course of SLE varies widely, ranging from a benign illness to a rapidly progressive disease with organ failure and death. Patients with SLE experience mortality rates two to five times higher than the general population, with renal disease-carrying the highest mortality risk [3,4]. SLE patients with renal damage and ESRD face a 14-fold and over 60-fold increased risk of premature death, respectively [5,6]. In a 10-year mortality study within our systemic lupus erythematosus (SLE) cohort from 2002 to 2011, lupus nephritis (LN) showed a significant association with a 2.46-fold increased risk of death (odds ratio, 95% confidence interval 1.13-5.37) [7]. The biopsy is a crucial diagnostic procedure for evaluating these patients, with histopathology playing a pivotal role in determining the classification, management, and prognosis of LN. Due to its varied presentation, LN is often considered a chameleon of renal pathology, necessitating accurate histologic classification to define the extent of kidney injury associated with SLE, guide treatment decisions, and predict outcomes [8]. The International Society of Nephrology/Renal Pathology Society classification for lupus nephritis (ISN/RPS), published in 2003, provides definitions and classification for glomerular lesions in LN. LN, as an immune-complex-mediated glomerulonephritis (GN), is categorized into six patterns or classes. In systemic lupus erythematosus (SLE) patients with renal injury, it is crucial to rule out other mechanisms of kidney injury, such as thrombotic microangiopathy and lupus podocytopathy, which can be observed in up to 24% and 1.3% of lupus nephritis (LN) patients, respectively. The recognition of isolated tubulointerstitial nephritis is also increasing [9]. Several studies have indicated that both SLE and LN exhibit distinct characteristics, highlighting significant heterogeneity in patient characteristics and outcomes. This heterogeneity is particularly evident in LN, where patients often experience the most

challenging clinical course [10,11]. A recent comprehensive cross-sectional study involving a multiethnic cohort of 1244 systemic lupus erythematosus (SLE) patients, nearly half of whom had concurrent lupus nephritis (LN), investigated genetic factors across different ethnicities. The study included individuals of Northern and Southern European, Hispanic, African American, and East Asian descent, genotyped for 817,810 single-nucleotide polymorphisms (SNPs) across the genome. The findings revealed distinct genetic factors associated with ethnicity, contributing to the heterogeneity in clinical characteristics and treatment responses [11]. However, data on the characteristics of LN patients and the therapeutic strategies employed in South-Eastern Europe are limited. Only one well-designed study has been published on the Croatian population, reflecting the diagnostic and therapeutic approach used more than two decades ago [12]. The objective of this study was to assess the clinicopathological features and predictors of lupus nephritis patients in Bangladesh.

METHODS & MATERIALS

This was a cross-sectional study conducted at the Department of Sir Salimullah Medical College Mitford Hospital, Dhaka, Bangladesh from January 2023 to July 2023. The study comprised 30 patients who underwent a renal biopsy as part of their clinical care, determined by their treating nephrologists. Participants were enrolled using a purposive sampling technique. The status of lupus nephritis was assessed using the Systemic Lupus Erythematosus Disease Activity Index (SLEDAI) and the International Society of Nephrology/Renal Pathology Society classification of lupus nephritis (ISN/RPS) [13,14]. Ethical approval for the study was obtained from the hospital's ethics committee, and written consent was obtained from all participants before data collection. The inclusion criteria for this study involved renal biopsies that were sent to a reference laboratory and reviewed by the same neuropathologist. Patients with renal biopsies containing more than 10 glomeruli were included. Exclusion criteria comprised patients who did not meet the criteria for systemic lupus erythematosus and did not correlate with laboratory parameters. Demographic and clinical information for all participants was recorded, and data analysis was conducted using the SPSS version 23.0 program. In the analysis, a p-value less than 0.05 was considered as the indicator of significance.

RESULT

In this study, examining the age distribution of study subjects revealed that the majority of participants (53%) belonged to the ≤24 years age group. Additionally, 10%, 23%, and 13% of cases were from the 25-34, 35-44, and ≥45 years age groups, respectively **(Figure 1)**.

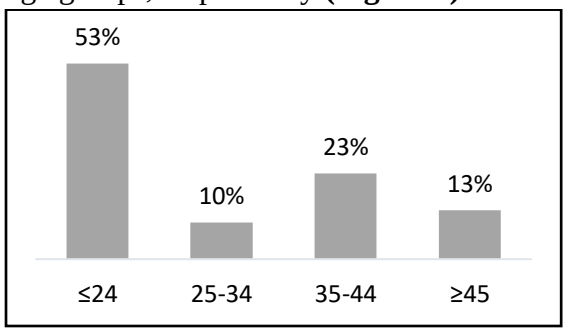

Figure 1: Ages of participants (N=30)

Analyzing the gender distribution among participants with lupus nephritis (LN), it was observed that the majority of cases (77%) were female, while the remaining 23% were male **(Figure 2)**.

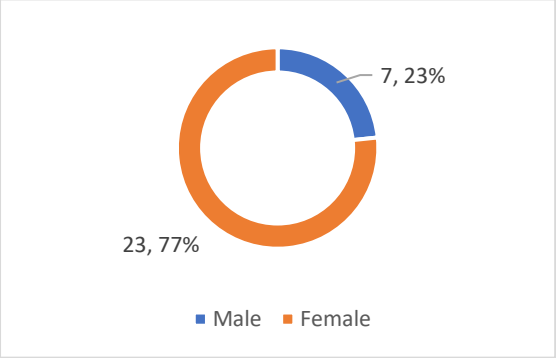

Figure 2: Gender distribution

In all participants, clinical features included low complement and proteinuria. In over three-fourths of cases (<100%), anti-dsDNA positivity, hematuria, and urinary casts were observed. Additionally, in over one-third of cases (<50%), arthritis, myositis, thrombocytopenia, rash, alopecia, and oral ulcer lesions were present **(Figure 3)**.

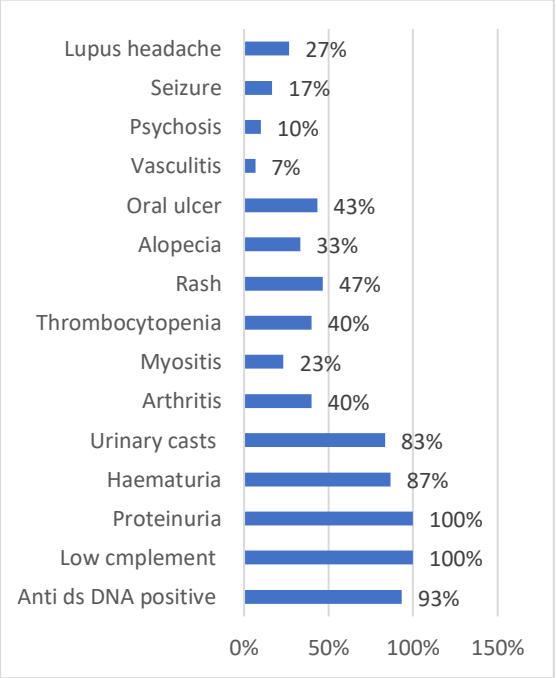

Figure 3: Clinical features distribution

Analyzing the classification of lupus nephritis based on the International Society of Nephrology/Renal Pathology Society (ISN/RPS), it was observed that the majority of cases (53%) were categorized as class IV. Additionally, 10%, 23%, and 13% of cases were classified as class II, III, and V, respectively **(Figure 4)**.

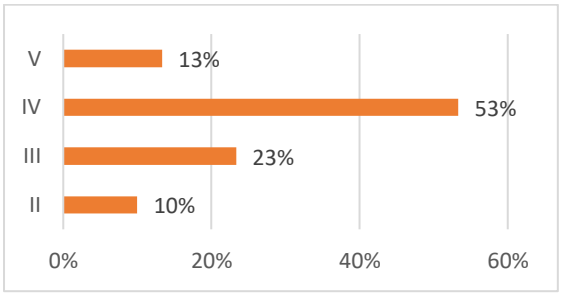

Figure 4: ISN/RPS score distribution

In this study, an analysis of the participants' SLEDAI 2K (Systemic Lupus Erythematosus Disease Activity Index) scores demonstrated a consistent pattern. Remarkably, every participant (100%) exhibited a SLEDAI 2K score of ≥20, indicating a high level of disease activity **(Table I)**.

Table I: SLEDAI 2K score distribution

SLEDAI 2K scores	n	%
No activity (0)	0	0%
Mild activity (1 to 5)	0	0%
Moderate activity (6 to 10)	0	0%
High activity (11 to 19)	0	0%
Very high activity (≥20)	30	100%

In our analysis, when comparing the mean SLEDAI 2K scores among various ISN/RPS-scored case groups, we identified statistically significant correlations in the majority of pairs through Student's T-tests **(Table II)**.

Table II: Comparison between ISN/RPS and SLEDAI 2K scores

ISN/RPS score (n)	SLEDAI 2K score Mean ±SD	ISN/RPS scores	SLEDAI 2K score Mean ±SD	P-value
II (3)	29.33 ±4.62	III (7)	49.29 ±12.85	0.034
		IV (16)	55.81 ±10.65	<0.001
		V (4)	24.25 ±0.96	0.079
III (7)	49.29 ±12.85	IV (16)	55.81 ±10.65	0.218
		V (4)	24.25 ±0.96	0.004
IV (16)	55.81 ±10.65	V (4)	24.25 ±0.96	< 0.001

The Student's T-tests were performed.

DISCUSSION

This study aimed to assess the clinicopathological features and predictors of lupus nephritis patients in Bangladesh. Examining the age distribution of study subjects in this research revealed that the majority of participants (53%) belonged to the ≤24 years age group. Additionally, 10%, 23%, and 13% of cases were from the 25-34, 35-44, and ≥45 years age groups, respectively. The age of presentation of lupus nephritis (LN) patients in this study was similar to the patient distribution in another study conducted in China [15]. Analyzing the gender distribution among participants with LN, it was observed that the majority of cases (77%) were female, while the remaining 23% were male. Similarly, in another study, it was shown that most participants (88.53%) were females, and 11.47% were males [16]. In this study, among all participants, clinical features included low complement and proteinuria. In over three-fourths of cases (<100%), anti-dsDNA positivity, hematuria, and urinary casts were observed. LN (lupus nephritis) clinical presentation may be asymptomatic with normal urinalysis, renal function, and 24-hour proteinuria [17]. Alternatively, it can manifest with urinary abnormalities such as hematuria, leukocyturia, cellular casts, and mild proteinuria. In more severe cases, it may lead to overt presentations like nephrotic syndrome, acute nephritic syndrome, or rapidly progressive renal failure [18]. Analyzing the classification of lupus nephritis (LN) based on the International Society of Nephrology/Renal Pathology Society (ISN/RPS) in this study, it was observed that the majority of cases (53%) were categorized as class IV. Additionally, 10%, 23%, and 13% of cases were classified as class II, III, and V, respectively. In a Bangladeshi study, ISN/RPS class IV-G was found to be the most frequent, representing about 64.7% of the total cases, and 11.8% of cases were class IV-S patients [19]. In a pediatric LN study by Shrivastava et al., class IV LN was the most common class [20]. In this investigation, a thorough examination of the participants' SLEDAI 2K (Systemic Lupus Erythematosus Disease Activity Index) scores revealed a strikingly uniform trend. Notably, each participant (100%) displayed a SLEDAI 2K score of ≥20, signaling a notable degree of disease activity. The factors affecting the outcome of disease are controversial, with worse prognosis in male sex, black race, onset

before puberty, persistent hypertension, impaired renal function, nephrotic syndrome, anemia, class IV nephritis, and increased histological activity index scores [21]. In our analysis, significant correlations were found in the majority of ISN/RPS-scored case groups when comparing mean SLEDAI 2K scores, as determined by Student's T-tests. Therefore, in critically ill patients where the International Society of Nephrology (ISN)/Renal Pathology Society (RPS) classification is challenging or impossible, the assessment of SLEDAI 2K scores can provide reliable information regarding lupus nephritis.

LIMITATION OF THE STUDY

This study has some limitations, including its single-centered nature and the relatively small sample size. Additionally, the study was conducted over a brief period, and as such, the findings may not accurately represent the broader scenario across the entire country.

CONCLUSION

Within the Bangladeshi population, lupus nephritis exhibits distinct demographic and clinical characteristics. The condition is notably more prevalent in younger individuals and females. The majority of lupus nephritis cases are characterized by an ISN/RPS score of IV, indicating a relatively advanced stage of renal involvement. Additionally, a higher frequency of cases presents with a Systemic Lupus Erythematosus Disease Activity Index (SLEDAI 2K) score of ≥20, highlighting a notable degree of disease activity. These findings provide valuable insights into the epidemiology and clinical profile of lupus nephritis in Bangladesh, emphasizing the need for targeted interventions and tailored management approaches, particularly in younger individuals and females who may be at a higher risk.

FUNDING

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CONFLICT OF INTEREST

None declared

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee

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