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Frequency Of Anti-Double Stranded DNA Seropositivity In Patients With Lupus Nephritis

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Abstract

Introduction: Renal involvement affects approximately half of patients with systemic lupus erythematosus (SLE), with increased frequency and severity among African, Hispanic, and Asian populations. Lupus nephritis (LN) may present early or remain silent until it progresses to end-stage renal disease (ESRD). Local data are limited for the presence of Anti-dsDNA antibodies in our LN patietns.

Objective: To determine the frequency of anti-dsDNA antibodies in patients with lupus nephritis.

Methods: A cross-sectional study was conducted at the Department of Nephrology, IKD, Peshawar, over six months (June – July 2020). A total of 139 patients who met the American College of Rheumatology criteria for SLE and were confirmed to have LN were evaluated. ELISA was used to detect the presence of anti-dsDNA antibodies.

Results: The mean age of the patients was 38 ± 9.91 years. Women comprised 66% of the cohort. Anti-dsDNA antibodies were detected in 41% of the patients.

Conclusion: Anti-dsDNA antibodies were detected in 41% of patients with lupus nephritis, highlighting the importance of routine screening for early detection and management.

Keywords: anti-dsDNA, antibodies, lupus nephritis, systemic lupus erythematosus, hematuria, nephrotic syndrome.

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Introduction:

Renal disease Luous nephritis (LN) affects frequently in patients with SLE, with a range of 20 – 60%.[1] Although a common early manifestation, it can occur at any time during the disease course.[2] LN presents

as acute nephritis, nephrotic syndrome, rapidly progressive glomerulonephritis or as an indolent disease diagnosed as end stage kidney disease.[1,3]

Improved outcomes of LN have resulted due to the better understanding of the disease immunology, targeted therapies and attention to the comorbidiites. Whole list of medications have evolved with robust clinical trials in different racial populations.[1,4] The future of care of LN patients will depend on the interplay of immunomodulating therapies and the current understanding.5,[6]

LN is probably the clinical feature most closely associated with autoantibody production in SLE, ever since Koffler' s seminal observation of complement-fixing IgG deposition in the glomeruli of patients with lupus nephritis.[7]

Anti-dsDNA antibody levels often correlate with disease activity as well thought to be pathogenic.[1-3,8] Anti-dsDNA antibodies result in pathogenesis due to its complexes with nucleosomes, direct biding to the glomerulobasement membrane surface antigens and its binding to the chromatin or nucleosome as a pre-requisite to become pathogenic..[9] The latter mechanism stems from experimental studies in lupus prone murine models where chromatin and IgG co-localized in glomerular sub-endothelial and sub-epithelial electron-dense deposits.[9]

We did not find any local literature on the burden of anti-ds DNA antibodies in the local LN population. This study evaluates the local burden and frequency of anti-dsDNA in patients presenting with LN in our local population.

Methods:

This study was conducted at department of Nephrology, Institute of Kidney Diseases Hayatabad Medical Complex, Peshawar, Pakistan. The study was carried out over a period of six months from January 2020 to July 2020 after the approval of the Ethical review dated September 4, 2019 from the Research Evaluation Unit (REU) Hyatabad Medical Complex, Peshawar, Pakistan.

Study Design: Cross sectional study.

139 patients underwent a detailed history and clinical examination. All patients were assessed based on the American College of Rheumatology classification criteria for SLE, followed by routine urine examination and/or 24- hour urinary protein to confirm lupus nephritis. Once confirmed, ELISA was performed to detect the presence or absence of anti-dsDNA antibodies. All laboratory investigations were performed by a single experienced pathologist having a minimum of 5 years of experience.

Data is presented as mean and standard deviation. Student t-test was applied for any significance <0.05. SPSS 19 (IBM Corp. Armond, NY, USA) was used for statistical analysis.

Results:

The mean age was 38±9.91 years and majority were females 92(66%). Table 1 represents the age distribution, gender, presence of cardiovascular disease, smoking status, family history of SLE and

frequency of anti-dsDNA antibodies. The stratification of anti-dsDNA antibodies with respect to age, sex, cardiovascular disease, smoking status, and family history is presented in Table 2.

Table 1: Demographics and Clinical Characteristics

Parameter	Frequency (n)	Percentage (%)
Age 18–40 years	95	68%
Age 41–60 years	44	32%
Male	47	34%
Female	92	66%
Cardiovascular Disease: Yes	10	7%
Cardiovascular Disease: No	129	93%
Smokers	25	18%
Non-smokers	114	82%
Positive Family History of SLE	17	12%
Negative Family History of SLE	122	88%
Anti-dsDNA Positive	57	41%
Anti-dsDNA Negative	82	59%

Table 2: Stratification of Anti-dsDNA Antibodies

Anti-dsDNA Antibodies	Positive (n)	Negative (n)	Total (n)	P value
Age	39 (18–40), 18 (41–60)	56 (18–40), 26 (41–60)	139	0.98
Gender	19 (M), 38 (F)	28 (M), 54 (F)	139	0.92
Cardiovascular Disease	4	6	139	0.94
Smoking	10	15	139	0.90

Discussion:

Our study population was young as expected, mean age was 38± 9.91 years and majority were females. Almost half of our patients (41%) had anti-dsDNA antibodies. This is the first study among our local population showing the frequency of anti-dsDNA antibodies

In a study carried out by Jia Y et al, sensitivity of anti-dsDNA antibodies was highest at 75% when specificity was around 90%.[10] The presence of ant-dsDNA IgG antibodies was significantly associated with active LN.

In another study by Pradhan VD et al where all patients had active SLE, 44% patients had renal biopsy-proven kidney involvement as LN.[11] ANA was positive in all patients, while anti-nucleosome antibodies were positive in 88% and anti-dsDNA in 80% of the cases. In their study the presence of anti-dsDNA antibody was higher than what we have reported, nevertheless no statistically significant difference was noted among patients with and without LN ($p > 0.05$).

The limitations of our study were small sample size and alck of inclusion of clinical and laboratory data to sorrelate with the presence or absence of anti-dsDNA antibodies.

Conclusion:

Our study concluded that the frequency of anti-double-stranded DNA antibodies was 41% among patients with lupus nephritis. Further larger studies in our population are required to document the true prevalence and its relation to the disease activity.

Conflict of interest: None declared.

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