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Research Article

Pattern of Haematological Parameters in SLE Patients

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Abstract: ***Introduction:*** Haematological abnormalities are frequently observed in systemic lupus erythematosus (SLE) and are included in both the American College of Rheumatology (ACR) and Systemic Lupus International Collaborating Clinics (SLICC) classification criteria.7 The purpose of this study is to evaluate the pattern of these haematological parameters in SLE patients, aiming to identify prevalent abnormalities and their correlation with disease activity and treatment response. ***Aim of the study:*** The aim of the study was to examine and analyze the distribution and variations of haematological parameters in patients diagnosed with Systemic Lupus Erythematosus (SLE). ***Methods:*** The retrospective observational study was conducted at the Department of Internal Medicine and Rheumatology, BSMMU, Dhaka, Bangladesh, from July 2014 to June 2015, involving 60 SLE patients. Data collection included demographic information and haematological parameters from medical records. Statistical analysis was performed using SPSS version 22.0 to assess demographics and prevalence of haematological abnormalities. ***Result:*** The study revealed a significant female predominance among the patients, with 54 (90.00%) females. Anaemia was the most prevalent haematological abnormality, affecting 56 patients (93.33%), and among those, anaemia of chronic disease was the most common type, occurring in 26 patients (46.09%). Coombs' test results indicated positivity in 22 patients (36.67%), and steroids were the most frequently prescribed DMARDs, used by 45 patients (75.00%). ***Conclusion:*** Haematological abnormalities, especially anaemia of chronic disease, are prevalent in Systemic Lupus Erythematosus patients, necessitating further research to understand their implications and natural progression.

Keywords: Haematological abnormalities, Systemic lupus erythematosus, Anaemia, Leukopenia, Thrombocytopenia.

INTRODUCTION

Systemic lupus erythematosus (SLE) is a systemic autoimmune disease characterized by damage to organs and cells caused by tissue-binding autoantibodies and immune complexes. It predominantly affects women of childbearing age, accounting for approximately 90% of cases, though individuals of all sexes, ages, and ethnic backgrounds can also be affected.[1] The prevalence of SLE varies globally, with about 40 cases per 100,000 people in the western world. Studies indicate a higher incidence among Black and Hispanic populations compared to other ethnic groups, with over 80% of cases occurring in women during their reproductive years.[2,3] This demographic distribution highlights the need for targeted awareness and management strategies, particularly among women.

Haematological abnormalities are prevalent in SLE and serve as important indicators of disease activity. The unpredictable course of the disease, marked by episodes of remission and relapse, necessitates regular monitoring of these parameters.[4] Common haematological abnormalities such as autoimmune hemolytic anaemia (AIHA), leukopenia, and thrombocytopenia are integral to both the American College of Rheumatology (ACR) and the Systemic Lupus International Collaborating Clinics (SLICC) classification criteria for SLE.[5,6] Their presence underscores the potential for complications and emphasizes the importance of vigilant management.

Anaemia is the most frequently observed haematological abnormality in SLE, with iron deficiency anaemia, anaemia of chronic disease, and AIHA being particularly common.[7] AIHA occurs in about 5-10% of cases and typically responds well to corticosteroid therapy.[8] Leukopenia and lymphopenia, which are often associated with active or severe disease, may

fluctuate during the clinical course despite treatment, complicating management.[9] Lymphopenia is particularly significant, with prevalence rates ranging from 20% to 93%, and it is closely linked with severe disease activity.[10] Thrombocytopenia affects 20-40% of SLE patients, though severe forms are rare, occurring in only about 5% of cases.[11,12] These abnormalities highlight the complexity of SLE management and the need for proactive monitoring to prevent complications.

Monitoring haematological parameters is essential for managing SLE, as these abnormalities provide insights into disease activity, treatment responses, and potential complications such as infections. Neutropenia, for example, is a common white blood cell abnormality in SLE, arising from increased peripheral destruction, altered margination, or reduced marrow production, and it heightens the risk of infections.[13] Immunosuppressive therapies can exacerbate these haematological abnormalities, making diagnosis and management more challenging. Regular monitoring allows for timely treatment adjustments and early intervention to prevent serious complications. Additionally, the absence of typical infection signs in immunocompromised patients necessitates heightened clinical vigilance. These haematological variations not only reflect disease progression but also guide individualized therapies, ultimately contributing to optimal patient outcomes.[14] The purpose of this study is to evaluate the pattern of haematological parameters in SLE patients, aiming to identify prevalent abnormalities and their correlation with disease activity and treatment response. This will provide insights to guide clinical management and improve patient outcomes.

Objectives

- The aim of the study was to examine and analyze the distribution and variations of haematological parameters in patients diagnosed with Systemic Lupus Erythematosus (SLE).

METHODOLOGY AND MATERIALS

The retrospective observational study was conducted at the Department of Internal Medicine and Rheumatology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, from July 2014 to June 2015. The study involved 60 patients diagnosed with Systemic Lupus Erythematosus (SLE) during this period.

Inclusion Criteria:

- Patients aged 15 years and older who met the American College of Rheumatology (ACR) criteria for the classification of SLE.
- Patients whose guardians provided informed consent for participation in the study.

Exclusion Criteria:

- Patients with haematological abnormalities due to conditions other than SLE.
- Patients receiving ongoing treatment for haematological issues unrelated to SLE.

Informed consent was obtained from all participants, ensuring confidentiality and voluntary participation. Data collection involved a structured questionnaire to gather demographic information, including age, gender, and relevant comorbidities, alongside haematological parameters obtained from patients' medical records, such as hemoglobin levels, white blood cell counts, platelet counts, and specific antibody tests (e.g., Coombs' test, antiphospholipid antibodies). Statistical analysis was performed using SPSS version 22.0, employing descriptive statistics to summarize demographic characteristics and the prevalence of haematological abnormalities. Chi-square tests were utilized to assess associations between demographic variables and haematological conditions, with p-values < 0.05 considered statistically significant. The study protocol was approved by the hospital authority of BSMMU, ensuring ethical compliance and patient confidentiality. Primary outcomes included the prevalence and types of haematological abnormalities among SLE patients, while secondary outcomes focused on identifying potential risk factors and the impact of treatment modalities on haematological parameters.

RESULT

Table 1: Demographic Characteristics of the Study Patients (n=60)

Variables		Frequency	Percentage (%)
Age (In years)	15-20	3	5.00
	21-25	7	11.67
	26-30	10	16.67
	31-35	14	23.33
	36-40	11	18.33
	>40	15	25.00
	Total	60	100.00
Gender	Female	54	90.00
	Male	6	10.00
	Total	60	100.00

The demographic analysis of the study patients highlighted that the largest proportion of patients were over 40 years old, accounting for 15 (25.00%). Additionally, 14 (23.33%) patients were aged 31-35 years, while the 26-30 years group comprised 10 (16.67%) patients. The younger age groups (15-20 and 21-25 years) had fewer patients, with 3 (5.00%) and 7 (11.67%), respectively. The gender distribution showed a significant female predominance, with 54 (90.00%) females compared to only 6 (10.00%) males.

Table 2: Haematological Abnormalities Among Study Patients (n=60)

Haematological Abnormality	Frequency	Percentage (%)
Anaemia	56	93.33
Thrombocytopenia	10	16.67
Leukopenia	12	20.00
Neutrophilia	8	13.33
Lymphopenia	14	23.33
Total	60	100.00

The analysis of haematological abnormalities revealed that anaemia was the most prevalent condition, affecting 56 patients (93.33%). Other notable abnormalities included lymphopenia in 14 patients (23.33%) and leukopenia in 12 patients (20.00%). Thrombocytopenia was observed in 10 patients (16.67%), while neutrophilia was present in 8 patients (13.33%).

Table 3: Types of Anaemia Observed Among Patients with Anaemia (n=56)

Type of Anaemia	Frequency	Percentage (%)
Iron Deficiency	15	26.79
Vitamin B12 Deficiency	10	17.86
Anaemia of Chronic Disease	26	46.09
Hemolytic Anaemia	5	8.93
Total	56	93.33

Among the patients diagnosed with anaemia, the most common type identified was anaemia of chronic disease, occurring in 26 patients (46.09%). Iron deficiency anaemia was observed in 15 patients (26.79%), while vitamin B12 deficiency contributed to anaemia in 10 patients (17.86%). Hemolytic anaemia was the least frequent, found in 5 patients (8.93%).

Table 4: Coombs' Test and Antiphospholipid Antibody Indicators (n=60)

Parameter		Frequency	Percentage (%)
Coombs' Test (Positive/Negative)	Positive	22	36.67
	Negative	38	63.33
Antiphospholipid antibody (IgG) test	Positive	11	18.33
	Negative	49	81.67

The results of the Coombs' test indicated a positive reaction in 22 patients (36.67%), while the majority, 38 patients (63.33%), tested negative. Regarding antiphospholipid antibodies (IgG), positivity was found in 11 patients (18.33%).

Table 5: Use of DMARDs Among Patients (n=60)

Name of DMARDs	Frequency	Percentage (%)
Steroids	45	75.00
Hydroxychloroquine	19	31.67
Cyclophosphamide	15	25.00
Methotrexate	5	8.33
Azathioprine	4	6.67

The analysis of Disease-Modifying Anti-Rheumatic Drugs (DMARDs) usage among the study patients showed that steroids were the most commonly prescribed medication, utilized by 45 patients (75.00%). Hydroxychloroquine was used by 19 patients (31.67%), while cyclophosphamide was administered to 15 patients (25.00%). Methotrexate and azathioprine were less frequently prescribed, with 5 (8.33%) and 4 (6.67%) patients receiving these treatments, respectively.

DISCUSSION

This retrospective observational study was carried out at the Department of Internal Medicine and Rheumatology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh. A total of 60 patients diagnosed with Systemic Lupus Erythematosus (SLE) during this period were analyzed to investigate the patterns of haematological abnormalities associated with the disease. Given the multisystem nature of SLE, the study focused on assessing key haematological parameters—such as anaemia, leukopenia, and thrombocytopenia—to evaluate their prevalence and clinical relevance. The objective was to gain deeper insights into how these abnormalities reflect disease activity and guide treatment, ultimately contributing to more targeted management strategies and improved patient care.

In our study, the age distribution revealed that the largest portion of patients, 60 (25.00%), were aged over 40 years, with significant representation in the 31-35 years (23.33%) and 36-40 years (18.33%) age groups. This aligns with findings by Aleem *et al*.[15], who reported a mean age of 34.3 ± 11.9 years among their systemic lupus erythematosus patients. Additionally, our study demonstrated a notable female predominance, with 54 (90.00%) of the patients being female, which is consistent with Aleem *et al*.'s[15] results showing a similar gender distribution in SLE cases. These demographic characteristics highlight the typical presentation of SLE and underscore the importance of considering gender and age in clinical management and treatment strategies.

In our study, anaemia emerged as the most frequent haematological abnormality, affecting 56 patients (93.33%), consistent with findings by both Beyan *et al*.[16] and Aleem *et al*.[15], where anaemia was also the most prevalent. Other abnormalities observed in our cohort included lymphopenia (23.33%), leukopenia (20.00%), thrombocytopenia (16.67%), and neutrophilia (13.33%). These findings highlight the importance of routine haematological assessments in SLE patients to ensure timely identification and management of potential complications.

In our study, anaemia of chronic disease emerged as the most frequent pattern, affecting 46.09% of the 56 patients with anaemia, consistent with findings by Beyan *et al*. [16], Aleem *et al*. [15], Keeling *et al*. [17], and Liu *et al*. [18], where this form of anaemia was also the most prevalent. Iron deficiency anaemia was

identified in 26.79% of cases, all of whom were females of reproductive age, reflecting a pattern commonly observed in the general population. Vitamin B12 deficiency contributed to 17.86% of cases, though it was not directly attributed to SLE. Hemolytic anaemia was noted in 8.93% of the cohort, highlighting the varied causes of anaemia in SLE and the importance of comprehensive evaluation and tailored management.

In our study, the Coombs' test indicated a positive result in 22 patients (36.67%), while 38 patients (63.33%) tested negative, highlighting a significant incidence of autoimmune hemolysis among the SLE cohort. Additionally, the antiphospholipid antibody (IgG) test revealed a positive result in 11 patients (18.33%), which aligns with findings by Levin *et al*.[19], who reported positive results in 12-30% of cases. This underscores the importance of performing both tests in SLE patients to identify potential autoimmune complications and guide clinical management.

In our study, we observed a significant utilization of various Disease-Modifying Anti-Rheumatic Drugs (DMARDs) among the 60 patients with Systemic Lupus Erythematosus (SLE). Notably, steroids were prescribed to 45 patients (75.00%), indicating their primary role in managing inflammation associated with SLE. Hydroxychloroquine was used by 19 patients (31.67%), demonstrating its importance in long-term management and potential protective effects against flares. Cyclophosphamide and azathioprine were used in 15 (25.00%) and 4 (6.67%) patients, respectively, which aligns with findings by Aleem *et al*.[15], who noted that these drugs were commonly associated with cytopenias in SLE patients. Our results suggest that while these medications are essential for managing SLE, careful monitoring is required due to their potential side effects, including drug-induced cytopenias, infections, and immune-mediated complications, as highlighted in the literature. This emphasizes the need for individualized treatment plans that consider both the therapeutic benefits and the risks associated with DMARD therapy in SLE patients.

These findings underscore the complexity of managing haematological abnormalities in SLE patients, emphasizing the need for regular monitoring and individualized treatment strategies. Future research should focus on long-term outcomes and the impact of tailored therapeutic interventions to optimize patient care and minimize complications.

Limitations of the study

This study had several limitations:

- Small sample size may limit the generalizability of the findings.
- Findings may not be generalizable due to the specific population studied.
- The study's limited geographic scope may introduce sample bias, potentially affecting the broader applicability of the findings.

CONCLUSION

Haematological abnormalities are frequently observed in patients with Systemic Lupus Erythematosus (SLE). This study highlights the predominance of anaemia, particularly anaemia of chronic disease, alongside notable rates of leukopenia and lymphopenia. It is crucial to identify these haematological changes as either direct manifestations of SLE, repercussions of its treatment, or signs of other haematological disorders. Future research with larger cohorts and advanced laboratory techniques is necessary to gain a deeper understanding of the prevalence and implications of these haematological issues. Additionally, cohort studies could offer valuable insights into the natural progression of haematological manifestations in SLE and the effects of different therapeutic approaches.

REFERENCES

1. Leyngold I, Baughman K, Kasper E, Ardehali H. Comparison of survival among patients with connective tissue disease and cardiomyopathy (systemic sclerosis, systemic lupus erythematosus, and undifferentiated disease). Am J Cardiol. 2007;100(3):513–7.
2. Hemminki K, Li X, Sundquist J, Sundquist K. Familial associations of rheumatoid arthritis with autoimmune diseases and related conditions. Arthritis & Rheumatism: Official Journal of the American College of Rheumatology. 2009 Mar;60(3):661-8.
3. Syuto T, Shimizu A, Takeuchi Y, Tanaka S, Hasegawa M, Nagai Y, Tamura A, Ishikawa O. Association of antiphosphatidylserine/prothrombin antibodies with neuropsychiatric systemic lupus erythematosus. Clinical Rheumatology. 2009 Jul;28:841-5.
4. Petri M. The effect of race on incidence and clinical course in systemic lupus erythematosus: The Hopkins Lupus Cohort. J Am Med Womens Assoc. 1998 Winter;53(1):9–12.
5. Petri M, Orbai A-M, Alarcón GS, Gordon C, Merrill JT, Fortin PR, *et al*. Derivation and validation of the Systemic Lupus International Collaborating Clinics classification criteria for systemic lupus erythematosus. Arthritis Rheum. 2012;64(8):2677–86.
6. Tan EM, Cohen AS, Fries JF, Masi AT, McShane DJ, Rothfield NF, *et al*. The 1982 revised criteria for the classification of systemic lupus erythematosus: REVISED CRITERIA FOR SLE. Arthritis Rheum. 1982;25(11):1271–7.
7. Hahn BH. Systemic lupus erythematosus and accelerated atherosclerosis. The New England Journal of Medicine. 2003 Dec 1;349(25):2379-80.
8. Hochberg MC. Updating the American College of Rheumatology revised criteria for the classification

of systemic lupus erythematosus. Arthritis and Rheumatism. 1997 Sep 1;40(9):1725.

9. Bhuyan UN, Malaviya AN. Deficiency of T cells in blood and tissues and severity of infections in systemic lupus erythematosus. Indian J Med Res. 1978;67:269–78.
10. Rivero SJ, Díaz-Jouanen E, Alarcón-Segovia D. Lymphopenia in systemic lupus erythematosus. Arthritis & Rheumatism: Official Journal of the American College of Rheumatology. 1978 Apr;21(3):295-305.
11. Xue Z, Wang X, Liu F, Hu S, Zhu S, Zhang S, Bu B. Intracranial hypertension syndrome in systemic lupus erythematosus: clinical analysis and review of the literature. Journal of Huazhong University of Science and Technology [Medical Sciences]. 2009 Feb;29:107-11.
12. Jump RL, Robinson ME, Armstrong AE, Barnes EV, Kilbourn KM, Richards HB. Fatigue in systemic lupus erythematosus: contributions of disease activity, pain, depression, and perceived social support. The Journal of Rheumatology. 2005 Sep 1;32(9):1699-705.
13. Katsanis E, Hsu E, Luke KH, McKee JA. Systemic lupus erythematosus and sickle hemoglobinopathies: a report of two cases and review of the literature. American Journal of Haematology. 1987 Jun;25(2):211-4.
14. Nossent JC, Swaak AJ. Prevalence and significance of haematological abnormalities in patients with systemic lupus erythematosus. QJM: An International Journal of Medicine. 1991 Jul 1;80(1):605-12.
15. Aleem A, Al Arfaj AS, Khalil N, Alarfaj H. Haematological abnormalities in systemic lupus erythematosus. Acta Reumatol Port. 2014;39(3):236–41.
16. Beyan E, Beyan C, Turan M. Haematological presentation in systemic lupus erythematosus and its relationship with disease activity. Haematology. 2007;12(3):257–61.
17. Keeling DM, Isenberg DA. Haematological manifestations of systemic lupus erythematosus. Blood Rev. 1993;7(4):199–207.
18. Liu H, Ozaki K, Matsuzaki Y, Abe M, Kosaka M, Saito S. Suppression of haematopoiesis by IgG autoantibodies from patients with systemic lupus erythematosus (SLE). Clin Exp Immunol. 1995;100(3):480–5.
19. Levin JS, Elkon K. Autoantibodies in SLE. Hochberg MC, Silman AJ, editors. Mosby. 2003;3:1337–46.