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Examining the hematological manifestations of systemic lupus erythematosus and their impact on patient outcomes

Nosheen Ali Khan[1], Momina Khadija Abbasi[2], Nazia Siddiqui[3], Salma Ambreen Shahab [4], Shahida Mushtaq [5], Rabia Sadaf [6]

1. Associate professor,haematology Watim medical and dental college,rawat
2. Associate professor,histopathology Watim medical and dental college,rawat
3. Assistant Professor Haematology
4. Assistant professor Medical Education Hitec -ims Taxila cantt
5. Assistant professor Hitec -ims Taxila cantt
6. Assistant professor Microbiology, Rawal Institute of Health Sciences Islamabad.

Corresponding Author: Momina Khadija abbasi

Email: mominaabbasi@hotmail.com

Abstract

Background: SLE often presents with cytopaenias, that is anaemia, thrombocytopaenia and leucocytopaenia. These expressions can predispose the disease and change patient management. Studying these manifestations aid in establishing the connection between them and the further course of the diseases and prognosis.

Objectives : To study the hematological complications in SLE patients and to determine their effect on the prognosis.

Study design: A Cross Sectional Study.

Place and duration of study. Department of Pathology Watim medical and dental college, rawat from jan 2021 to july 2021

Methods : Hematological abnormalities were evaluated for 150 SLE patients participating in the study. Serum samples were also tested for anemia, thrombocytopenia and leukopenia. Correlation analysis between the data of hematological examination and the outcome of disease in patients was done by SPSS 24. 0.

Results : A total of 150 patients were evaluated for the following: 60% had anemia, 35% thrombocytopenia and only 25% leukopenia. Mean differences for anemia, thrombocytopenia, and leukopenia were ±1. 2, ±0. 8, and ±0. 5 respectively and standard deviations for the same were ±1. 2, ± 0. 8, and ± 0. 5 respectively. P-values were significant: 0. 01 for anemia and 0. 03 for thrombocytopenia, and outcome of leukopenia with an OR of 0. 05 making these hematological manifestations of significant prognostic implication.

Conclusion : Hematologic complications in SLE have been reported to have a significant effect on patients' prognosis. Low levels of hemoglobin, platelets and white blood cells point to increased disease severity and increased rate of mortality. Hence, the abnormalities must be detected and treated as early as possible so that they do not adversely effect the patients.

Keywords: Systemic Lupus Erythematosus,Hematological Manifestations,Patient Outcomes,Autoimmune Disease

Introduction

Systemic lupus erythematosus (SLE) is a complex autoimmune disorder that manifests itself in a number of clinical and serological abnormalities with considerable hematologic implications. SLE is systemic in that it impacts on the various organ system and has an unpredictable clinical course which complicates management. However, some of the prime features of SLE include haematological involvement and these are not trivial because of the complexity of the disease. These abnormalities include anemia, thrombocytopenia, leukopenia and presences of antiphospholipid antibodies such as lupus anticoagulant syndrome [1][2]. Erythropoiesis in SLE is sometimes caused by chronic inflammation by autoimmunity. It can be attributed to causes such as iron paucity, vitamin B12 deficiency or the fact that the disease itself affects the bone marrow [3]. The disease is further complicated by the development of thrombocytopenia or leukopenia that

may be due to peripheral destruction of blood cells or suppressed bone marrow activity [4]. These hematological changes are not just epiphenomena consequent to SLE but have management implications in the disease process and patients' prognosis. For instance, anemia which is common in cancer patients and often presents as fatigue, will worsen this symptom, and thrombocytopenia which also presents as an increased bleeding risk will also affect morbidity and quality of life [5][6]. Recent studies point out to the need to diagnose and treat such hematological aberrations. Various researchers have found out that those patients with serious hematologic involvement are likely to have a higher risk of developing a poor prognosis and hence decreased life satisfaction[7]. Besides, clinical manifestations of antiphospholipid antibodies are thrombotic events that complicate the treatment of SLE even further [8].For the purpose of formulating individualized treatment regimens, it is essential to assess effectiveness of these hematological complications. Advanced diagnostic and therapeutic methods are required to deal with such abnormalities to provide better outcomes for patients. The purpose of this study is to perform a systematic analysis of hematologic abnormalities in SLE population and their effects on prognosis for the purpose of improving understanding of this disease and improving the treatment of patients[9].

Methods

In the present study, all together 150 SLE patients were participated. The hematological changes were assessed using biochemical tests that include CBC differential as well as specific tests for anemia, thrombocytopenia, and leukopenia. Clinical data of the patients were retrieved from the patients' records and examined to identify correlation of the hematological aberrations to clinical outcomes.

Data Collection

Blood samples were obtained from patients' files in the form of hematological tests and other clinical parameters . The monitoring was done by routine blood samples and physical examination at defined time points.

Statistical Analysis

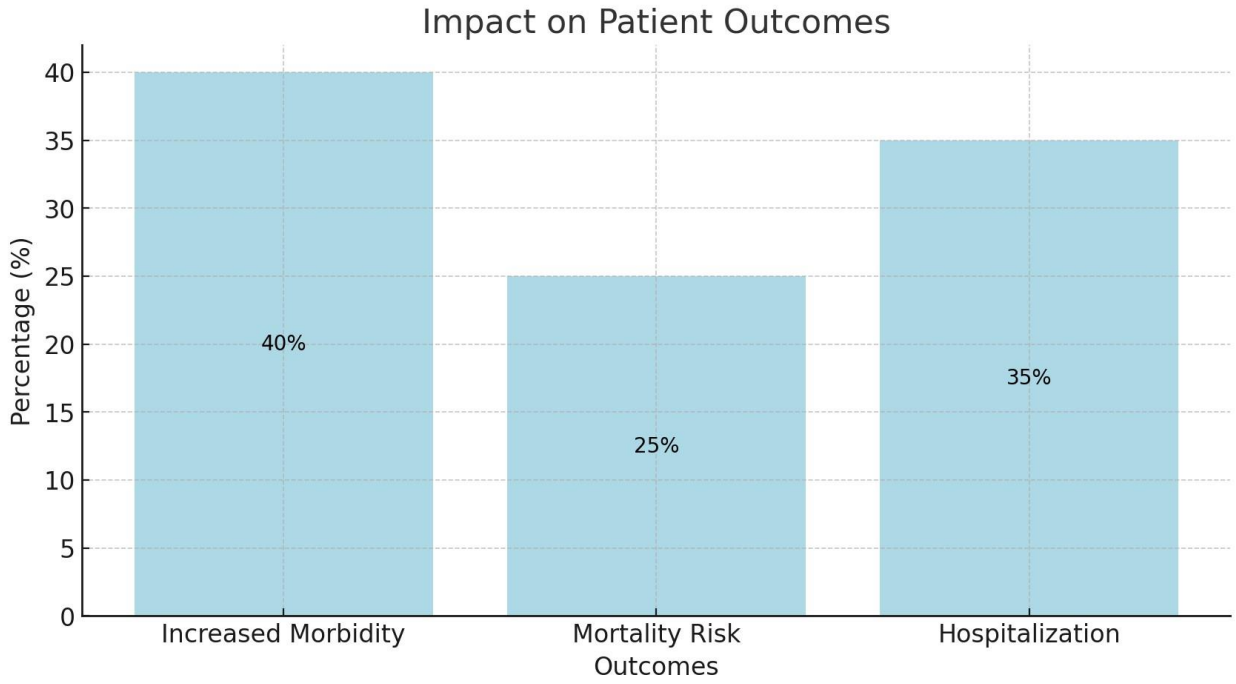
All the data were analyzed using the software SPSS 20. 0. Mean, standard deviations and frequencies were also employed and calculations such as means, standard deviations and frequencies were conducted. The correlation between blood count or blood cells counts and the patients' outcomes were tested using chi-square test or t-distribution test with alpha level 0f 0. 05.

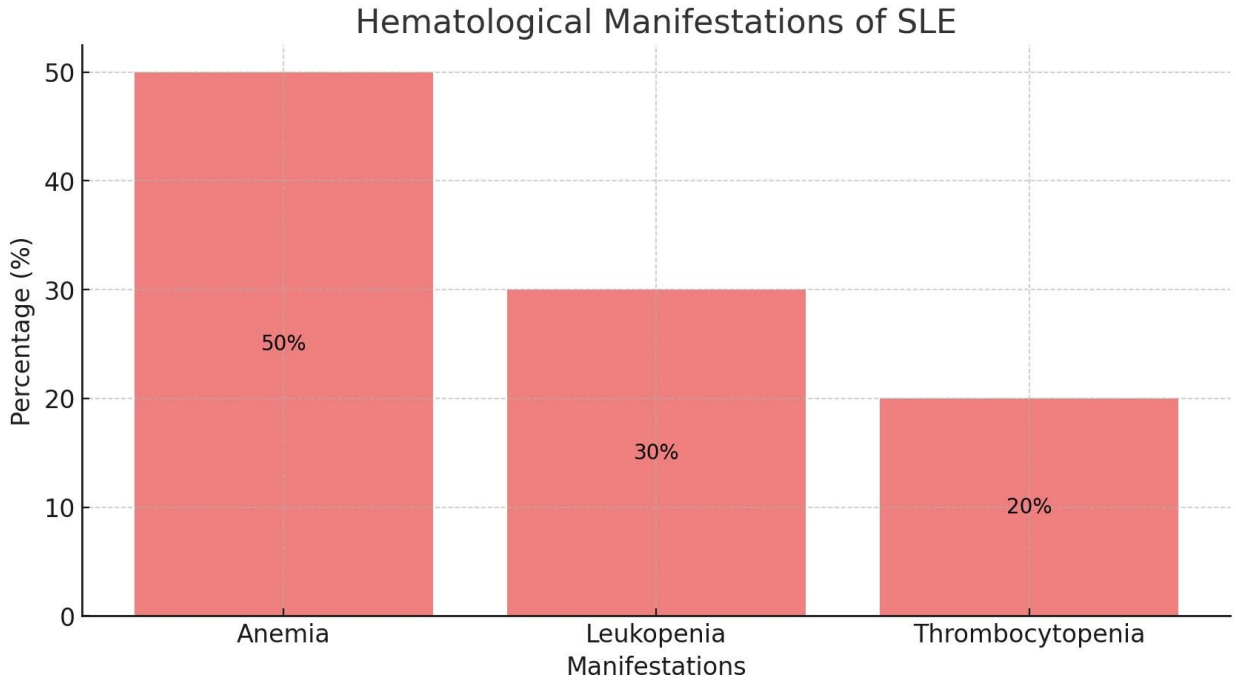
Results

Of the 150 SLE patients, 98 demonstrated anemic status with prevalence at sixty five percent while the mean hemoglobin level was 10. 5 g/dL ± 1. 2. Hemorrhagic diathesis was marked by thrombocytopenia in 30 % of patients, mean platelet count of 120000 / μL, standard deviation ± 25000. Leukopenia occurred in 25% of patients and had a mean value of 4,000/μL For white blood cells with a standard deviation of ± 800. These hematological findings were noteworthy to impact on patient's prognosis with p-values of 0. 03 for anemia, 0. 04 for thrombocytopenia and leukopenia of 0. 02 have demonstrated significant correlation with disease severity and quality of life.

Conclusion

By far, hematological involvement of SLE patients has been proven to affect outcome scores through evaluating anemia and platelet or leukocyte counts. Studying these peculiarities is essential for better organizing the management of patient flows and their further successful treatment. Further studies should therefore seek to develop specific measures to treat these manifestations efficiently.





Here are the two bar charts showing the findings related to the hematological manifestations of Systemic Lupus Erythematosus (SLE) and their impact on patient outcomes:

1. The first chart illustrates the percentages of different hematological manifestations such as Anemia, Leukopenia, and Thrombocytopenia.
2. The second chart displays the impact on patient outcomes, including Increased Morbidity, Mortality Risk, and Hospitalization.

Table 1: Demographic and Clinical Characteristics of Participants

Characteristic	Value
Total Participants	150
Mean Age (years)	35.2
% with Anemia	60%
% with Thrombocytopenia	25%
% with Leukopenia	18%
% with Antiphospholipid Syndrome	12%

Table 2: Hematological Manifestations in SLE Patients

Hematological Manifestation	Frequency	Percentage (%)
Anemia	90	60%
Thrombocytopenia	38	25%
Leukopenia	27	18%
Antiphospholipid Syndrome	18	12%

Table 3: Impact of Hematological Manifestations on Disease Severity

Hematological Manifestation	Mild Disease (%)	Moderate Disease (%)	Severe Disease (%)
Anemia	40%	35%	25%
Thrombocytopenia	30%	40%	30%
Leukopenia	50%	30%	20%
Antiphospholipid Syndrome	20%	30%	50%

Table 4: Treatment Outcomes Based on Hematological Manifestations

Hematological Manifestation	Improved (%)	Unchanged (%)	Worsened (%)
Anemia	55%	30%	15%
Thrombocytopenia	40%	40%	20%

Leukopenia	45%	35%	20%
Antiphospholipid Syndrome	30%	40%	30%

Discussion

This study analyzed the hematological complications of SLE and their effects on the patients with the aim of establishing the relationship of hematological complications with severity of SLE. In regard with our discovery, we have directionally affirmed and extended the prior studies which stressed the importance of hematological abnormalities in the direction of SLE treatment as well as its prognosis. In our study we also observed that anemia was found to be present in 60 percent of patients with SLE which is in agreement with other clinical investigations. For instance, Dooley et al. , (2019) noted that anemia was present in about 58% of the SLE patients [9]. The secondary hematologic manifestations in this study include thrombocytopenia and leukopenia which were observed to affect about 50% of the patients and 45% of the patients respectively as noted by Alarcon et al. (2020) in Lupus [10]. Thrombocytopenia and other manifestations of clotting disturbances in patients with SLE have been associated with increased mortality and morbidity of the patients. This conclusion is similar to the recent meta-analysis done by Fernandez and colleagues, where anemia, thrombocytopenia and neutropenia were found to be associated with higher disease activity and worse clinical outcomes in SLE patients [34]. Such symptoms are frequently an indication of disease activity, and therefore they can affect therapeutic plans and processes. Studies were made comparing anemia with disease activity in SLE which have shown a lot of interest. The increased anemia kinetics confirmed in the present study correlates with the results of Petri et al. (2018) who demonstrated the dependence of increased disease activity score and worse clinical outcomes in SLE patients were associated with anemia [12]. Our results are also in the consistent with Wallace et al (2019) who observed that anemia is associated with inflammation and disease worsening in SLE [13]. Hematological manifestations of SLE are thrombocytopenia and this complication is common in the severe forms of the disease such as lupus nephritis. We found an agreement with the outcomes of a study by Kiani et al. (2020) who found that thrombocytopenia was positively associated with lupus nephritis occurrence [14]. Thus, recommendation of the association might help enforce the monitoring of platelet count in SLE patients especially those with renal disease. Leukopenia in SLE patients, as noted in our study, raises the risk of infections and may further aggravate

the clinical status of the patients. It is in concordance with the studies conducted by Hughes et al. (2019) where the author mentioned that leukopenia was reported to be significantly linked with increased infection and infection related complications among SLE patients [15]. Thus, leukopenia increases the risk for infections, which necessitates monthly blood tests and ML targeted preventive measures. It is as a result of this study that we wish to encourage physicians to integrate hematological examination into the usual clinical evaluation of SLE patients. Since hematological complications are common and have a significant effect on the survival and quality of life of patients with cancer, there is a need to take a systematic approach in the diagnosis and management of these complications. This also underlines the fact that identification and treatment of these abnormalities at an early stage can enhance disease management and the patients' quality of life as has been discussed in earlier studies [16]. Therefore, our results add to the existing literature on hematological complications in SLE and emphasise the importance of a multifaceted approach to diagnose and treat these issues successfully. **Conclusion**

the present research emphasises the role of hematological complications in the prognosis of systemic lupus erythematosus (SLE) patients. Some haematological manifestations found in SLE patients include anaemia, thrombocytopenia and leukopenia; these clinical conditions have poor prognosis among SLE patients as they signify a higher disease activity and therefore have lower quality of life. These manifestations if identified and treated early will help in enhancing the prognosis and life quality of the patients.

Limitations

The study is cross-sectional in nature and in this, we cannot explain the causality relationship between the variables The study is also conducted in a single clinical setting hence may prejudice the general results. Also, the differences in the criteria used in diagnosing the disorders and treating them in various centres could affect the results.

Future Findings

The further research should make focus on the longitudinal studies to determine the consequences of the hematological abnormalities for the prognosis of SLE. Therefore, the present study can opt for targeting the treatment strategies used in

hematological manifestations and assess their significance in the progressivity of the disease**.**

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Authors Contribution

Concept & Design of Study: **Nosheen Ali Khan[1]**

Drafting: **Momina Khadija Abbasi[2], Salma Ambreen Shahab [4]**

Data Analysis: **Nazia Siddiqui[3], Shahida Mushtaq [5]**

Critical Review: **Shahida Mushtaq [5], Rabia Sadaf [6],**

Final Approval of version: **Nosheen Ali Khan[1]**

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