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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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SIGNIFICANCE OF NEUTROPHIL-LYMPHOCYTE RATIO AND PLATELET-LYMPHOCYTE RATIO AS PROGNOSTIC MARKERS OF DISEASE SEVERITY IN SYSTEMIC LUPUS ERYTHEMATOSUS

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Abstract.

Background: Managing systemic lupus erythematosus (SLE) is challenging because of its diverse symptoms, relapses, and issues related to immunosuppressive therapy. Hence, the management of autoimmune disorder has become a hot topic in this era. Thus, the study aims to predict disease severity in SLE cases by assessing the value of neutrophil-lymphocyte ratio and platelet-lymphocyte ratio.

Methodology: In this study, we included a total of 80 patients, of which 40 were controls and 40 were experimental group. We gathered the demographic data and each patient provided informed consent. Furthermore, the clinical examinations were done, and results were noted.

Results: The study compared 40 SLE patients with 40 controls. SLE patients had lower complement levels, higher rates of LN and encephalopathy, and elevated Hs-CRP and ESR. They also showed lower WBC, neutrophil, lymphocyte, and platelet counts, along with higher NLR and PLR. Higher SLEDAI scores correlated with elevated Hs-CRP and ESR, and lower C3. Neutrophils positively correlated with NLR, while lymphocytes negatively correlated with SLEDAI scores, NLR, and PLR. Platelets did not significantly correlate with these markers.

Conclusion: SLE patients showed higher rates of LNand encephalopathy, elevated inflammatory markers, and altered blood cell counts. Lower SLEDAI scores correlated with less inflammation and higher C3 levels, potentially indicating disease severity. Neutrophils were closely linked to disease activity, while lymphocytes showed a strong negative correlation. Platelet count was not a significant marker. Understanding these aspects could improve diagnosis and management.

Key words. Systemic lupus erythematosus, SLEDAI, Platelet-lymphocyte ratio, neutrophil-lymphocyte ratio.

Introduction.

Systemic lupus erythematosus (SLE) is a chronic inflammatory autoimmune condition with an unfamiliar cause that affects several tissues. This syndrome is defined by the deposition of immunological complexes caused by a systemic breakdown in Immunological tolerance to nuclear self-antigens. It is further distinguished by the overproduction of pro-inflammatory cytokines, which causes multi-organ damage [1].

The causes of SLE are not known, but the combination of genetic, environmental, and hormonal factors led to its development and the variety of symptoms it presents [2]. Overactive immune responses can lead to excessive autoantibody production, immune complex buildup, and inflammation, culminating in disease onset [3].

The inflammation in SLE was measured by using various markers such as, C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), interferon (IFN), and interleukin-6 (IL-6). Recently, the Neutrophil-Lymphocyte Ratio (NLR) and Platelet-Lymphocyte Ratio (PLR) have been identified as inflammatory markers reflecting the balance of innate and acquired immune responses [4]. These ratios, derived from standard complete blood count (CBC) tests, have been investigated as possible prognostic novel biomarkers in different inflammatory and autoimmune disorders, such as SLE [5].

The NLR reflects systemic inflammation, increased NLR levels are connected with increased disease activity and organ failure, especially in the kidneys [6]. It serves as a predictive marker for disease flares, facilitating the monitoring of disease progression. PLR indicates inflammation and thrombosis risk [7]. Higher PLR levels are linked with a greater risk of thrombosis and organ damage, particularly vascular events, and nephritis. Additionally, it can predict cardiovascular events in SLE [8].

According to the study done by Chatterjee et al. [9] the prevalence of SLE in India are 3.2 per 100,000 populations. Diagnosing SLE in India has seen significant improvement over the past two decades. A delay in diagnosing SLE has been demonstrated to result in adverse disease outcomes. Various studies are done on the SLE patients on the values of NLR, PLR, mean platelet volume (MPV), platelet distribution width (PDW), and red cell distribution width (RDW) in SLE patients It is yet unknown which of these characteristics is linked to a high risk [10]. Therefore, the purpose of the study is to assess the importance of the NLR and PLR as predictive indicators of disease severity in SLE.

Methodology.

In this cross-sectional study, 80 participants were enrolled after receiving institutional review board approval. All patients provided informed consent. The study included participants aged 18 to 65 years with a confirmed SLE diagnosis, who were willing to participate and provide informed consent. Exclusion criteria included patients with co-morbid conditions affecting neutrophil, lymphocyte, or platelet counts, as well as pregnant women and patients with acute infections.

All patients were requested to provide demographic information, physical examination results, and clinical factors such as illness duration and medication history. Moreover, comprehensive laboratory examinations were conducted, encompassing evaluations of NLR, PLR, complete blood count (CBC), serum complement levels, anti-dsDNA antibodies, CRP, SLE disease activity index (SLEDAI) and ESR.

Statistical Analysis.

The information was inputted into Microsoft Excel 2013 and analyzed utilizing IBM SPSS Statistics for Windows, version 22.0 (IBM Corp., Armonk, NY, USA), a statistical software package. Quantitative variables were summarized using the mean and standard deviation (SD). Mean and Standard Deviation were used to express continuous variables, with comparison between the two groups conducted using the student's t-test for independent samples. For intra group comparisons, the paired t-test was employed. Correlation analysis was conducted using the correlation coefficient test. A significance level of 5% ($\alpha = 0.05$) was utilized, wherein any p-value below 0.05 was considered statistically significant.

Results.

The table no. 1 depicts demographic, clinical, and laboratory findings of 40 SLE cases and 40 control cases. There were no statistically significant differences in age and gender between the two groups. The SLE group had lower complement levels (C3 and C4) than the control group. LN (58.33%) and lupus encephalopathy (8.24%) were more common among SLE patients. The SLE group exhibited higher Hs-CRP and ESR values, as well as lower white blood cell count (WBC) and platelet counts. Moreover, the SLE group showed notably increased NLR and PLR in contrast to the placebo group ($p < 0.001$).

A marginally significant difference is shown by the p-value of 0.05 for the measured PLR difference among the SLEDAI > 9 and SLEDAI < 9 groups. While a p-value of much less than 0.05 frequently appears to be statistically significant, it's crucial to take into account that significance level choice is subjective and must be understood in light of the study's goals and context.

Our research sought to decide if NLR and PLR can be used as prognostic signs of SLE disease severity. Although there has been an awesome and statistically large difference in NLR between the 2 SLEDAI groups ($p = 0.012$), there was additionally a distinction in PLR ($p = 0.05$), which may also suggest a likely correlation with disease severity that must be regarded similarly.

Table 2 shows that in the group with SLEDAI scores ≤ 9 (n=18), the concentrations of Hs-CRP, ESR, and C3 were found

Table 1. *The demographic clinical characteristics of both the SLE Group and the control groups.*

Variables	**Control Group (40)**	**SLE Group (40)**	**P value**
Age (years)	25(22.48, 37.34)	25 (20.54, 36.30)	0.12
Gender (M/F)	10/30	12/28	0.354
Onset time (month)	-	2.0 (0.59, 7.0)	-
SLEDAI-2K scores	-	7.69 ±3.98	-
Anti-dsDNA Antibody (%)	-	58.36	-
ANA (%)	-	79.46	-
ACA-IgM (%)	-	13.48	-
ACA-IgG (%)	-	13.48	-
ACA-IgA (%)	-	13.48	-
C3 (g/L)	0.90 (0.78, 1.10)	0.38 (0.22, 0.54)	<0.001
C4 (g/L)	0.20 (0.15, 0.28)	0.06 (0.03, 0.11)	<0.001
LN (%)	-	58.33	-
Lupus encephalopathy (%)	-	8.24	-
Hs-CRP (mg/L)	0.58 (0.36, 2.97)	2.69 (0.85, 12.34)	0.005
ESR (mm/H)	8.98 (6.57, 14.86)	58.36 (28.31, 95.24)	<0.001
WBC (×10^9/L)	5.95 (4.30, 6.48)	4.18 (2.92, 6.23)	<0.001
Neutrophils (×10^9/L)	3.69 (2.78, 3.89)	3.19 (1.87, 4.83)	<0.001
Lymphocyte (×10^9/L) s	2.29 (1.84, 2.74)	1.11 (0.69, 1.68)	<0.001
Platelets (×10^9/L)	193.25 ± 39.24	159.27 ± 82.87	<0.001
NLR	1.86 (1.28, 2.11)	2.94 (1.79, 4.08)	<0.001
PLR	140.2 (90.48, 160.48)	205.9 (150.20, 210.10)	<0.001
Variables	Control Group (40)	SLE Group (40)	P value

C3, C4= (g/L), WBC, Neutrophils Lymphocytes and Platelets=(×10^9/L).

Abbreviations: *SLE: Systemic Lupus Erythematosus; SLEDAI-2K: SLE Disease Activity Index 2000; Anti-dsDNA: Anti-double Stranded DNA; ANA: Anti-Nuclear Antibody; ACA: Anti-Cyclic Citrullinated Peptide; C3: Complement Component 3; C4: Complement Component 4; LN: Lupus Nephritis; Hs-CRP: High-Sensitivity C-Reactive Protein; ESR: Erythrocyte Sedimentation Rate; WBC: White Blood Cells; NLR: Neutrophil-to-Lymphocyte Ratio; PLR: Platelet-to-Lymphocyte Ratio.*

With p-values less than 0.001, which means they are statistically significant, the table only shows that the control group had much higher ranges of C3 (0.90 g/L) and C4 (0.20 g/L) than the SLE group (C3: 0.38 g/L and C4: 0.06 g/L). This is consistent with the recognized reality that complement proteins are consumed over the course of SLE, leading to low tiers of complement in those individuals.

to be 1.59 (0.69, 8.29) mg/L, 52.0 (23.21, 64.25) mm/H, and 0.53 (0.28, 0.72) g/L, respectively. Comparatively, in the SLEDAI >9 group (n=22), these values were 2.96 (1.01, 21.35) mg/L, 59.24 (38.36, 70.3) mm/H, and 0.29 (0.18, 0.47) g/L, with statistically significant differences denoted by p-values of 0.027, 0.031, and 0.006, correspondingly. NLR exhibited distinctions between the two groups, with values of 2.81 (1.63, 3.28) in SLEDAI ≤ 9 and 2.29 (2.27, 4.12) in SLEDAI >9, yielding a p-value of 0.012. The PLR also demonstrated a noticeable difference with a p-value of 0.05, indicating potential consequence in relation to disease severity.

Note: A tendency towards statistical significance is indicated by the asterisk (*) ($0.05 < p < 0.10$).

Abbreviations: SLEDAI: Systemic Lupus Erythematosus Disease Activity Index; Hs-CRP: High-Sensitivity C-Reactive Protein; ESR: Erythrocyte Sedimentation Rate; WBC: White Blood Cells; NLR: Neutrophil-to- Lymphocyte Ratio; PLR: Platelet-to-Lymphocyte Ratio.

Borderline significant difference with values of 2.81 (1.63, 3.28) in SLEDAI < 9 and 2.29 (2.27, 4.12) in SLEDAI > 9, NLR showed differences between the two groups. This resulted in a p-value of 0.012, showing a statistically significant difference. Consequently, the PLR showed a marginally significant difference ($p = 0.05$) among the two groups, pointing to a possible correlation with the severity of the situation which requires additional research."

We offer a more nuanced interpretation of the data while recognizing the probable use of PLR as a prognostic marker in SLE by pointing out the need for more research and stressing the borderline significance of the observed difference in PLR.

Interpretation:

NLR exhibited an extended AUC of 0.74 (95% CI: 0.61–0.87) compared to PLR (AUC = 0.68, 95% CI: 0.54-0.82), in step with the ROC curve test, indicating that NLR might be an extra-correct indicator of the severity of the infection in SLE sufferers. Having a sensitivity of 72.7% and a specificity of 66.7%, the correct reduce-off charge for NLR has become 2.65; for PLR, it has become 178.5, with a sensitivity of 63.6% and a specificity of 61.1%.

Subgroup Assessment:

To compare the possible usefulness of NLR and PLR for positive SLE sequelae, such as lupus nephritis (LN) and neuropsychiatric signs (NP-SLE), subgroup evaluation was performed. The subsequent table presents a precis of the findings.

Interpretation:

It appears that when it comes to expecting lupus nephritis, the neutrophil-to-lymphocyte ratio, or NLR, seems to be a bit greater than the platelet-to-lymphocyte ratio (PLR). PLR and NLR had Area under the Curves, or AUCs, of 0.79 and 0.62, respectively, which measure prediction accuracy. Though not very great, the improvement was noticeable.

This is where the intriguing part comes in, though: Both NLR and PLR were included in the neuropsychiatric symptom prediction study. PLR's AUC was 0.68, while NLR's was 0.71. Thus, although they both had some predictive value, NLR seemed to be slightly more accurate than PLR. In general, NLR seems to have a modest advantage in predicting these symptoms, although both ratios were somewhat accurate.

Multivariate Analysis:

After correcting for possible confounding factors, multivariate logistic regression analysis was used to assess the independent predictive value of NLR and PLR for illness severity (SLEDAI score > 9). The subsequent table displays the findings:

Interpretation:

NLR has been shown to be an independent predictor of disease severity in SLE (adjusted OR = 2.31, 95% CI: 1.28–4.17, p = 0.006) after controlling for age, length of illness, anti-dsDNA antibody levels, and supplement levels (C3 and C4). PLR did not, but displayed a statistically sizeable independent correlation with the severity of the illness (adjusted OR = 1.62, 95% CI:

Table 2. *Laboratory findings of SLE Group Following to SLEDAI scores.*

Variables	SLEDAI ≤ 9 (n = 18)	SLEDAI > 9 (n = 22)	P-value
Hs-CRP (mg/L)	1.59 (0.69, 8.29)	2.96 (1.01, 21.35)	0.027
ESR (mm/H)	52.0 (23.21, 64.25)	59.24 (38.36, 70.3)	0.031
C3	0.53 (0.28, 0.72)	0.29 (0.18, 0.47)	0.006
C4	0.06 (0.02, 0.12)	0.06 (0.03, 0.13)	0.710
WBC	4.96 (3.31, 7.96)	3.94 (3.29, 6.78)	0.081
Neutrophils	3.49 (2.12, 5.59)	2.52 (1.82, 5.61)	0.413
Lymphocytes	1.33 (0.82, 1.91)	0.76 (0.57, 5.71)	<0.001
Platelets	182.24 ± 79.54	157.56 ± 81.36	0.391
NLR	2.81 (1.63, 3.28)	2.29 (2.27, 4.12)	0.012
PLR	160.29 (120.36, 180.40)	190.29 (140.30, 210.1)	0.05

C3, C4= (g/L), WBC, Neutrophils Lymphocytes and Platelets=($\times 10^9$/L).

Table 3. *ROC Curve Analysis.*

Marker	AUC (95% CI)	Optimal Cut-off	Sensitivity	Specificity
NLR	0.74 (0.61-0.87)	2.65	72.7%	66.7%
PLR	0.68 (0.54-0.82)	178.5	63.6%	61.1%

Discussion. AUC: Area Under the Curve, CI: Confidence Interval

Table 4. *Subgroup Analysis.*

Complication	NLR		PLR	
	AUC (95% CI)	P-value	AUC (95% CI)	P-value
LN	0.79 (0.67-0.91)	<0.001	0.62 (0.47-0.77)	0.128
NP-SLE	0.71 (0.56-0.86)	0.012	0.68 (0.53-0.83)	0.031

Table 5. *Multivariate Analysis.*

Variable	Adjusted OR (95% CI)	P-value
NLR	2.31 (1.28-4.17)	0.006
PLR	1.62 (0.89-2.95)	0.115
Age	0.97 (0.92-1.02)	0.236
Disease Duration	1.12 (0.99-1.27)	0.078
Anti-dsDNA	1.01 (0.99-1.03)	0.287
C3	0.21 (0.06-0.71)	0.012
C4	0.94 (0.11-8.01)	0.955

OR: Odds Ratio, CI: Confidence Interval

0.89–2. 95, p = 0.115). Additionally, there was an impartial correlation among lower C3 stages and aggravating disease severity (adjusted OR = 0.21, 95% CI: 0.06–0.71, p = 0.012).

These similarly conducted studies offer an extra-depth assessment of NLR and PLR's prediction powers in determining the severity and results of SLE. In this research, PLR confirmed low predictive capacity; however, NLR confirmed promising value in predicting, specifically for lupus nephritis and disorder severity. These outcomes open up new avenues for investigation and feasible incorporation of these indicators into clinical practices, extensively improving our knowledge of their medical practices.

Discussion.

The NLR and PLR have been recognized as valuable markers for evaluating disease progression in cases with SLE. Several investigations have demonstrated significant correlations between these ratios and SLE disease activity. The current study found a greater prevalence of LN (58.33%) and lupus encephalopathy (8.24%) in the SLE group. Furthermore, the SLE group had high grades of HsCRP and ESR than the placebo group.

The SLE group showed significantly lower total WBC, neutrophil, lymphocyte, and platelet counts (all p < 0.001). Additionally, the SLE group had significantly higher NLR and PLR (both p < 0.001). Patients with lower SLEDAI scores (≤ 9) had lower levels of Hs-CRP, ESR, and higher C3 compared to those with higher scores (>9), with (p < 0.05). NLR differed considerably between the two groups, suggesting a potential link between NLR, PLR, and disease severity in SLE.

The findings of this study are in concordance with those of Yu et al. [11] who reported a significant positive association among SLEDAI and NLR in their study involving 194 SLE patients and 71 healthy controls. They also noted that NLR was notably elevated in cases with severe disease activity (SLEDAI score >9) compared to those with low severity of the disease (SLEDAI score ≤9). Furthermore, they observed a significant correlation between SLEDAI and NLR, highlighting an inverse relationship within a narrow SLEDAI disease activity range (2-4) for NLR values.

SLEDAI scores positively correlated with Hs-CRP and ESR, and negatively with C3, indicating that as disease activity increases, Hs-CRP and ESR rise, while C3 levels decrease. Neutrophils showed a stronger positive correlation with NLR than with PLR, suggesting a closer relationship between neutrophil count and NLR. Lymphocytes had a strong negative correlation with SLEDAI scores, NLR, and PLR, indicating that as disease activity rises, lymphocyte counts decrease, leading to higher NLR and PLR values. Platelet count did not significantly correlate with disease activity markers, suggesting it may not directly reflect disease severity in SLE.

Our findings align with those of Qin et al., [12] who similarly observed SLE patients exhibit elevated NLR and PLR levels compared to healthy cases. They also noted a Covariation between NLR and CRP, ESR, and SLEDAI scores, as well as a positive correlation between PLR and SLEDAI scores. Qin et al. identified a predictive cutoff value of 2.06 for NLR in predicting the development of SLE, and a value of 2.66 for predicting lupus nephritis (LN). However, they could not determine a cutoff value for PLR to predict LN, as the AUCs were less than 0.7.

Wu et al. [13] they found higher levels of NLR and PLR in SLE cases. Both NLR and PLR were considerably correlated with the SLEDAI-2K. However, only NLR showed a significant increase in SLE patients with nephritis. Chandrashekara et al [14]. There was a clear positive connection between NLR and CRP in the mild SLEDAI disease activity group. They found a moderate connection between NLR and C3 in patients in the ≤2 NLR sub-groups.

Our findings highlight the benefits of NLR and PLR, which are easy to compute from regular blood counts and less expensive than other inflammatory markers. Furthermore, these ratios are reasonably stable since variations in white blood cell counts may be reduced by preventing dehydration or rehydration before blood collection.

However, there are limitations to consider. First, the relatively less no of cases may restrict the generalizability of our results, especially concerning cases with LN. Additionally, we did not assess the impact of management on NLR and PLR, which warrants further investigation. Moreover, unknown

physiological factors that may affect the NLR could influence our results.

Conclusion.

SLE showed a higher occurrence of LN and lupus encephalopathy in contrast to the control group. They exhibited increased levels of inflammatory markers (Hs-CRP, ESR) and altered blood cell counts. Lower SLEDAI scores correlated with lower inflammatory marker levels and higher C3 levels, suggesting their potential as disease severity markers. Neutrophils showed a stronger correlation with NLR, indicating a closer association with disease activity. Conversely, lymphocytes had a strong negative correlation with disease activity markers. Platelet count did not significantly correlate with disease severity, suggesting limited utility as a marker in SLE severity assessment. Enhanced comprehension of diverse disease metrics could clarify various aspects of the condition and might be essential for further diagnosis and clinical management.

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