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Original article

Mean platelet volume is decreased in adults with active lupus disease

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ABSTRACT

Background: Only a few biomarkers are available for assessing disease activity in systemic lupus erythematosus (SLE). Mean platelet volume (MPV) has been recently studied as an inflammatory biomarker. It is currently unclear whether MPV may also play a role as a biomarker of disease activity in adult patients with SLE.

Objective: We investigated the association between MPV and disease activity in adult patients with SLE.

Methods: In this retrospective study, we compared two groups of adult patients divided according to disease activity (36 per group). Subjects were age- and gender-matched.

Results: MPV was significantly decreased with respect to those of inactive patients (7.16 ± 1.39 *vs.* 8.16 ± 1.50, $p = 0.005$). At a cutoff level of 8.32 fL, MPV has a sensitivity of 86% and a specificity of 41% for the detection of disease activity. A modest positive correlation was found between MPV and albumin ($r = 0.407$, $p = 0.001$), which in turn is inversely associated with disease activity.

Conclusions: In summary, MPV is decreased in adult patients with active lupus disease, and positively correlated with albumin, another biomarker of disease activity. Prospective studies are needed to evaluate the prognostic value of this biomarker.

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O volume plaquetário médio está reduzido em adultos com lúpus ativo

Palavras-chave:
Lúpus Eritematoso Sistêmico
Volume Plaquetário Médio
Atividade da Doença
Marcadores Biológicos
Albumina Sérica

RESUMO

Antecedentes: Existem poucos biomarcadores disponíveis para avaliar a atividade da doença no lúpus eritematoso sistêmico (LES). O volume plaquetário médio (VPM) foi recentemente estudado como um biomarcador inflamatório. Atualmente não está claro se o VPM também pode desempenhar um papel como um biomarcador da atividade da doença em pacientes adultos com LES.

Objetivo: Investigou-se a associação entre o VPM e a atividade da doença em pacientes adultos com LES.

Métodos: Neste estudo retrospectivo, compararam-se dois grupos de pacientes adultos divididos de acordo com a atividade da doença (36 por grupo). Os indivíduos foram pareados por idade e gênero.

Resultados: O VPM esteve significativamente diminuído nos pacientes com doença ativa em comparação com os níveis em pacientes com doença inativa ($7{,}16 \pm 1{,}39$ *versus* $8{,}16 \pm 1{,}50$, $p = 0{,}005$). Em um nível de corte de 8,32 fL, o VPM tem uma sensibilidade de 86% e uma especificidade de 41% para a detecção da atividade da doença. Encontrou-se uma correlação positiva modesta entre o VPM e a albumina ($r = 0{,}407$, $p = 0{,}001$), que por sua vez está inversamente associada à atividade da doença.

Conclusões: Em resumo, o VPM está diminuído em pacientes adultos com lúpus ativo, e positivamente correlacionado com a albumina, outro biomarcador da atividade da doença. São necessários estudos prospectivos para avaliar o valor prognóstico desse biomarcador.

Introduction

Platelet size correlates with platelet activity. Autoimmune reactions are thought to contribute to platelet activation in systemic lupus erythematosus (SLE). In fact, there is a correlation between mean platelet volume (MPV) values and active inflammatory diseases.[1,2] It has been recently reported that MPV is increased in patients with juvenile SLE. Moreover, this parameter increased in parallel with the activity index, and appears to be more accurate than erythrocyte sedimentation rate (ESR) and C3 in detecting disease activity.[3] However, it is currently unclear whether MPV may also play a role as a biomarker of disease activity in adult patients with SLE. Therefore, we conducted the present study to test this hypothesis.

Material and methods

Subjects and study design

A retrospective, cross-sectional, comparative design was used for this study. Demographic and laboratory data were obtained by reviewing medical records of all patients who had been diagnosed with SLE in our hospital. Systemic Lupus International Collaborating Clinics (SLICC) classification criteria were used for the diagnosis, except for those patients who were diagnosed before these criteria were published, in which case it was made using the American College of Rheumatology (ACR) criteria. Lupus nephritis was classified according to the International Society of Nephrology/Renal Pathology Society (ISN/RPS) 2003 classification. The inclusion criteria were as follows: age older than 16 years; diagnosis of SLE; and a Mexican Systemic Lupus Erythematosus Disease Activity Index (Mex-SLEDAI) scored in the polyclinic (inactive patients) or at admission (active patients), as recorded by a rheumatology fellow. Exclusion criteria were the following: infection, thrombocytopenia, rheumatoid arthritis (RA), ankylosing spondylitis (AS), inflammatory bowel disease (IBD), psoriasis, and incomplete medical record. Overall disease activity was assessed with Mex-SLEDAI. Patients scoring <2 were classified as inactive, while those scoring >5 were classified as active.[4,5] This study was approved by the ethics committee of the Autonomous University of Nuevo León Faculty of Medicine. Written informed consent was not required.

Assays

Blood samples were taken by from both plain and EDTA tubes. The latter were used for complete blood count (CBC). Most routine CBC were done with a Cell-Dyn Ruby analyzer (Abbott Diagnostics, USA), while most clinical chemistry parameters (creatinine, blood urea nitrogen and serum albumin) were measured using a DxC800 Synchron analyzer (Beckman Coulter, USA). ESR determinations were performed by the Wintrobe method, whose upper normal limit was 20 mm/h.

Statistics

Based on a previous report on MPV in juvenile SLE,[3] sample size was calculated using comparisons of means. Calculation was performed using $\alpha = 0.05$, $\beta = 0.20$, and two tails. A total sample size of 60 (30 in each group) would be required to demonstrate a statistically significant difference between groups. Data were first analyzed for normality

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