



CHANGES IN PLATELET INDICES IN PATIENTS WITH RHEUMATOID ARTHRITIS –A CROSS SECTIONAL STUDY

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ABSTRACT

Platelet parameters such as Mean platelet volume (MPV) and Platelet distribution width (PDW) are indicators of platelet activation. In cases with Rheumatoid arthritis inflammatory markers such as C-reactive protein and Erythrocyte sedimentation Rate are affected. Studies have pointed out the occurrence of changes in platelet counts in acute stages of Rheumatoid arthritis, the cause being platelets response to inflammation. Very few studies have demonstrated the relation between platelet indices and inflammatory markers. Hence we aimed to study the relation between platelet indices and acute phase reactant Erythrocyte Sedimentation Rate (ESR). We studied a total of 100 symptomatic active cases of Rheumatoid arthritis who satisfied the diagnostic criteria. In such patients, platelet counts and indices were correlated with ESR and CRP values. In our study analysis we found an increase in platelet counts, higher values of PDW and MPV. There is statistically significant correlation between Platelet counts, Platelet distribution width and ESR.

KEYWORDS: Rheumatoid Arthritis, Platelet Counts, Platelet Distribution Width, Mean Platelet Volume, C -Reactive Protein, Erythrocyte Sedimentation Rate.



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INTRODUCTION

Rheumatoid arthritis is a chronic inflammatory disease affecting the peripheral joints in a symmetrical pattern. Studies have highlighted the association of thrombocytosis in symptomatic active cases of rheumatoid arthritis^(1,2). The relation is often correlated with disease severity particularly in active and relapse cases.⁽³⁾ Though studies have pointed out the changes in platelet counts the platelet parameters such as Platelet distribution Width, Mean Platelet Volume and its relation to disease process which are encountered in automated analyzers have not been mentioned. Hence we aimed to find the correlation between platelet parameters and chronic inflammatory marker, ESR

MATERIALS AND METHODS

The study was approved by the institutional ethical and research committee of Sree Balaji Medical College and Hospital, Chennai. The

study was conducted during the period from August 2013 to September 2014 in the department of Hematology. Our study included a total of 100 symptomatic active cases of rheumatoid arthritis diagnosed according to the American College of Rheumatology criteria and 100 age matched non-rheumatoid patients were considered as controls for our study. 2ml of EDTA blood were taken. Complete hemogram including Platelet counts, Platelet indices were performed using fully automated hematology analyzer Mindray BC5380. ESR was performed using Westgren's tube method. C-Reactive Protein and Rheumatoid Factor were performed using rapid diagnostic card test. Patients with malignancy, infections, granulomatous diseases, pregnancy and patients with chronic diseases were excluded in our study. The results were tabulated and analyzed using SPSS version 15.0.

RESULTS

Table 1
Baseline characteristics of cases and controls

Characteristics	Cases		Controls	
	Mean	SD	Mean	SD
Age (years)	39.87	0.971	36.24	0.897
Hemoglobin (g/dl)	12.34	0.523	13.42	0.645
White blood count (cu mm)	11480.82	712.25	4565.54	419.12
Platelet count (cu mm)	489000	478.89	312400	175.67
Mean Platelet Volume (fl)	9.26	0.147	7.6	0.023
Platelet distribution width (fl)	17.9	1.671	12.54	1.567
ESR (mm/hr)	45.56	3.890	8.5	2.581
CRP (mg/L)	3.55	0.734	1.93	0.342

Table 2
Pearson correlation table for Platelet counts, platelet indices and ESR

Characteristics	Cases		Controls	
	Pearson correlation (r value)	p-value	Pearson correlation (r value)	p-value
Platelet counts and ESR	0.945	0.01*	0.33	0.01*
Mean platelet volume and ESR	0.395	0.86	0.26	0.06
PDW and ESR	0.856	0.01*	0.06	0.80

*Significance at p value < 0.05 level.

In a total of 100 symptomatic active cases of rheumatoid arthritis studied, majority of 74 were males 26 cases were females. All the symptomatic active cases were adults ranging from 21-50 years of age. Table 1 shows the baseline characteristics of our study population. We found WBC (Mean =11480.82, SD =712.25), Platelet counts (Mean=489000, SD =478.89) higher compared with age matched controls. In our study cases of Rheumatoid arthritis, Platelet indices, Mean Platelet Volume (Mean =9.26fl, SD=0.147) and Platelet Distribution Width (Mean=17.9, SD =12.54) values were also higher compared to age matched controls. ESR in the first hour (Mean=45.56, SD=3.89) and C-Reactive protein (Mean=3.55, SD=0.734) the inflammatory markers were higher in seropositive rheumatoid arthritis cases compared to healthy normal controls. Table 2, represents the Pearson correlation of platelet counts, platelet indices and ESR. There was statistically significant correlation between platelet counts and ESR (r = 0.945, p value = 0.01), with significant positive correlation between PDW and ESR (r = 0.856, p value = 0.01) among the study cases.

DISCUSSION

In our study cases of 100 seropositive rheumatoid arthritis, there is an association between platelet count and ESR with higher values similar to other studies by Yazici et al⁽⁴⁾ and Koyama H et al⁽⁵⁾. This is most likely due to the involvement of platelets in inflammation process and the major cause of increase in platelet counts in blood should be the result of release in cytokine levels which promotes thrombopoiesis in active stages of

inflammation.⁽⁶⁾ our study cases presented with higher values of mean platelet volume and platelet distribution width (Table 1). we also found statistically significant correlation of platelet counts and platelet parameter, platelet distribution width with ESR. Mean Platelet Volume did not correlated with ESR in Rheumatoid patients (Table 2). The study done by Baynes RD et al observed low levels of Mean platelet volume in active cases of rheumatoid patients which is in contrast to our results⁽⁷⁾. Our study followed similar trend with increase in platelet distribution width in a study by Jurcut C et al⁽⁸⁾. In addition we also found statistically significant correlation of platelet counts and platelet parameter, platelet distribution width with ESR. But Mean Platelet Volume did not correlated with ESR in Rheumatoid patients.

CONCLUSION

Our study showed significant positive correlation between platelet counts, platelet distribution width and ESR. This justifies the role of platelets and its indices in the active stages of rheumatoid arthritis and associated thrombocytosis. Hence platelet indices which are routinely measured in automated hematology analysers can be clinically utilized for assessment of disease activity.

ACKNOWLEDGEMENT

We like to thank our Professor Shivakumar, Department of Orthopedics, Sree Balaji Medical college, Chennai for his constant support and guidance.

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