

ASSOCIATION OF MEAN PLATELET VOLUME WITH DISEASE SEVERITY OF PSORIASIS VULGARIS

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ABSTRACT;

Background; Psoriasis is a common chronic recurrent inflammatory skin disease and platelet activation has been reported to be associated with its pathogenesis. This study was done to document mean MPV levels in patients with psoriasis vulgaris in our population as local data is scarce on this topic. **Objectives;** To determine MPV in patients with psoriasis vulgaris and to compare MPV in psoriasis with PASI > 10 and PASI < 10. **Material and Methods;** Patients fulfilling the stated criteria were recruited through Dermatology OPD of Nishtar Hospital, Multan, Pakistan. Purpose of the study was explained to them and informed consent was signed before their enrolment into the study. Relevant history, physical examination, PASI, and BMI was carried out. Laboratory parameters included CBC (hemoglobin, White blood cell, platelet count, MPV, PDW) and was measured using an auto-analyzer (Sysmex XE 2000 Germany). Alanine aminotransferase(ALT), Blood urea nitrogen(BUN), Creatinine, plasma sugar levels, Uric acid, Serum cholesterol, ESR, Hepatitis B and C screening and a baseline ECG was performed. Data was entered and analyzed by software SPSS version 15. **Results;** Our study comprised of a total of 100 patients meeting inclusion criteria of our study. Of these 100 study cases, 66 (66%) were male patients while 34 (34 %) were female patients. Mean age of our study cases was 39.98 ± 9.66 years (with minimum age of our study cases was 26 years while maximum age was 60 years). Of these 100 study cases, 41 (41 %) belonged to rural areas and 59 (59 %) belonged to urban areas. Monthly family income up to Rs. 50000 was noted in 48 (48%) while more than 50000 rupees was noted in 52 (52 %) of our study cases. Mean body mass index of our study cases was 23.62 ± 2.18 kg/m² and BMI more than 25 kg/m² was noted in 18 (18 %) of our study cases. Of these 100 study cases, 78 (78%) had PASI less than 10 while 22 (22%) had PASI equal /more than 10. Mean MPV was 8.63 ± 0.67 fL (with minimum MPV was 7.8 fL while maximum was 9.9 fL). **Conclusion;** Mean platelet volume (MPV) was elevated among patients having psoriasis vulgaris and was significantly increased in patients with PASI \geq 10 or disease severity. MPV is a good marker for disease severity of psoriasis vulgaris. MPV was significantly associated with gender, age, socioeconomic status, BMI and disease severity. All the clinicians treating such patients should regularly monitor MPV levels for early diagnosis of severity of the disease for better clinical outcomes.

Keywords; Psoriasis, mean platelet volume, disease severity.

INTRODUCTION

Psoriasis is a prevalent, chronic inflammatory skin disease that affects approximately 0.5%–1% of children and 2%–3% of the world's population.¹ Its most common clinical variant is termed as psoriasis vulgaris, which

affects approximately 85 to 90% of all patients with the disease. Psoriasis Vulgaris is characterized by oval or irregularly shaped, red, sharply demarcated, raised plaques covered by silvery scales. The disease is defined by a series of linked cellular changes in the skin: Hyperplasia of epidermal keratinocytes, vascular dilatation, and infiltration of various types of leucocytes in affected skin.² It is believed to be multifactorial with numerous key components including genetic susceptibility, environmental triggers in combination with skin barrier disruption and immune dysfunction.³ It is mediated by crosstalk between epidermal keratinocytes, dermal vascular cells, and immunocytes such as antigen presenting cells (APCs), macrophages, langerhan's cells, natural killer cells and T cells.¹ Platelets are closely linked to the pathogenesis of inflammatory skin diseases, including psoriasis, atopic dermatitis, contact dermatitis, and urticaria via various mechanisms. Platelet aggregation is greatly enhanced in psoriatic patients compared with that in healthy individuals, and this elevated aggregation is markedly decreased after improvement of psoriatic skin lesions.⁴ With both surface receptors (P-selectin, integrin's, CD40, Toll-like receptors and chemokine receptors) and stored mediators (adenosine diphosphate, adenosine triphosphate, serotonin, cytokines, and chemokines), they are able to respond to various stimuli to activate inflammatory responses.⁵

Among the wide array of methods measuring platelet activation, mean platelet volume (MPV) is a simple parameter to estimate platelet activity and aggregation.⁶ It is measured by automated hematology analyzer and is included in routine complete blood count (CBC) analysis. There are various reports regarding MPV in psoriasis, with conflicting and supportive results. Dae Suk Kim et al⁷ reported 9.862 ± 0.75 in psoriasis patients with PASI<10, and 10.08 ± 0.67 in psoriasis patients with PASI>10 with p value of 0.038. The change of MPV was closely related to the clinical severity.

Zaheer et al⁸ reported that MPV was found higher in the patients of psoriasis as compared to the healthy individuals. The mean value of MPV in case group was 8.24 ± 1.22 fl, whereas in the control group was 7.29 ± 0.77 fl ($p < 0.05$).

However Saleh et al⁹ showed no difference of MPV between psoriasis and controls with MPV values of 9.32 ± 1.30 fl with a p value of 0.55.

Based upon the contrary studies mentioned above, this study is proposed to study the relationship between MPV and psoriasis. Besides this psoriasis is fairly common ailment in Pakistan and there is quite dearth of data in literature regarding MPV and its relationship with disease severity^{10, 11}, it will provide necessary data for the further scholars to build on.

MATERIAL AND METHODS

A total of 100 Patients with psoriasis vulgaris on history and examination aged more than 18 years of either sex were included in this descriptive cross-sectional study. Patients with hypertension, diabetes, cardiovascular disorders, obesity, cancer, hematological disorders, rheumatoid arthritis, inflammatory bowel disease, chronic liver disease, chronic kidney disease, autoimmune disorders and patients on medication which affects platelet functions (e.g. acetyl salicylates, anti-epileptics, heparin) were excluded from our study. Patients fulfilling the stated criteria were recruited through Dermatology OPD of Nishtar Hospital, Multan, Pakistan. Purpose of the study was explained to them and informed consent was signed before their enrolment into the study. Relevant history, physical examination, PASI, and BMI was carried out. Laboratory parameters included CBC (hemoglobin, White blood cell, platelet count, MPV, PDW) and was measured using an auto-analyzer (Sysmex XE 2000 Germany). Alanine aminotransferase (ALT), Blood urea nitrogen (BUN), Creatinine, plasma sugar levels, Uric acid, Serum cholesterol, ESR, Hepatitis B and C screening and a baseline ECG was performed. Data was entered and analyzed by software SPSS version 15. Descriptive statistics was calculated for quantitative variables like age, MPV and BMI and presented as mean + SD. Frequencies and percentages were calculated for gender, obesity, residential status, monthly family income and disease severity. Independent sample t-test was used to compare the MPV between $PASI \geq 10$ and $PASI < 10$. P value of < 0.05 was considered significant.

RESULTS;

Our study comprised of a total of 100 patients meeting inclusion criteria of our study. Of these 100 study cases, 66 (66%) were male patients while 34 (34 %) were female patients. Mean age of our study cases was 39.98 ± 9.66 years (with minimum age of our study cases was 26 years while maximum age was 60 years). Mean age of

the male patients was noted to be 41.77 ± 10.82 years while that female patients was 36.50 ± 5.50 years ($p=0.009$). Our study results have indicated that majority of our study cases i.e. 60 (60%) were aged up to 40 years. Of these 100 study cases, 41 (41 %) belonged to rural areas and 59 (59 %) belonged to urban areas. Monthly family income up to Rs. 50000 was noted in 48 (48%) while more than 50000 rupees was noted in 52 (52 %) of our study cases. Mean body mass index of our study cases was 23.62 ± 2.18 kg/m² and BMI more than 25 kg/m² was noted in 18 (18 %) of our study cases. Of these 100 study cases, 78 (78%) had PASI less than 10 while 22 (22%) had PASI equal /more than 10. Mean MPV was 8.63 ± 0.67 fL (with minimum MPV was 7.8 fL while maximum was 9.9 fL).

DISCUSSION;

Psoriasis is a chronic inflammatory disease observed at a rate of 0.91–8.5% in the adult population^{12,13}. It is an ongoing progressive disease accompanied by periods of attacks and remissions, which is caused by immunologically mediated mechanisms¹⁴. Psoriasis is related to ulcerative colitis, gastrointestinal disorders such as Crohn's disease and in the group of rheumatic diseases, such as rheumatoid arthritis and ankylosing spondylitis. Psoriasis is defined as an immune-mediated inflammatory disease (IMID)^{15,16}.

Our study comprised of a total of 100 patients meeting inclusion criteria of our study. Of these 100 study cases, 66 (66%) were male patients while 34 (34 %) were female patients. A study conducted by Kilic et al¹⁷ has also reported 54 % male gender predominance which is close to our study results. A study conducted by Kim et al¹⁸ from Korea has reported 64.77 % male gender predominance in patients with psoriasis vulgaris which is close to our study results.

Mean age of our study cases was 39.98 ± 9.66 years (with minimum age of our study cases was 26 years while maximum age was 60 years). Mean age of the male patients was noted to be 41.77 ± 10.82 years while that female patients was 36.50 ± 5.50 years ($p=0.009$). Our study results have indicated that majority of our study cases i.e. 60 (60%) were aged up to 40 years. A study conducted by Kilic et al¹⁷ has also reported 37.66 ± 14.63 years mean of the patients with psoriasis vulgaris which is in compliance with our study results. A study conducted by Kim et al¹⁸ from Korea has reported 39.82 ± 15.16 years mean age of the patients with psoriasis vulgaris which is close to our study results.

Of these 100 study cases, 41 (41 %) belonged to rural areas and 59 (59 %) belonged to urban areas. Monthly family income up to Rs. 50000 was noted in 48 (48%) while more than 50000 rupees was noted in 52 (52 %) of our study cases. Mean body mass index of our study cases was 23.62 ± 2.18 kg/m² and BMI more than 25 kg/m² was noted in 18 (18 %) of our study cases.

Of these 100 study cases, 78 (78%) had PASI less than 10 while 22 (22%) had PASI equal /more than 10. Mean MPV was 8.63 ± 0.67 fL (with minimum MPV was 7.8 fL while maximum was 9.9 fL). A study conducted by Kilic et al¹⁷ has also reported 8.79 ± 0.86 fL mean MPV among patients with psoriasis vulgaris which is similar to our study results. A study conducted by Kim et al¹⁸ from Korea has reported 9.92 ± 0.73 fL mean MPV among patients with psoriasis vulgaris which is in compliance with our study results. In our study mean MPV was significantly elevated in patients with PASI equal or more than 10 (8.29 ± 0.23 fL and 9.83 ± 0.07 fL, $p = 0.000$, respectively). Similar observations have been made by Kim et al¹⁸ who reported elevated MPV with increasing PASI ($p=0.006$). These findings are in compliance with our study results. A study conducted by Canpolat et al¹⁹ also reported 8.7 ± 0.9 fL mean MPV among patients with psoriasis which is close to our study results.

CONCLUSION;

Mean platelet volume (MPV) was elevated among patients having psoriasis vulgaris and was significantly increased in patients with PASI ≥ 10 or disease severity. MPV is a good marker for disease severity of psoriasis vulgaris. MPV was significantly associated with gender, age, socioeconomic status, BMI and disease severity. All the clinicians treating such patients should regularly monitor MPV levels for early diagnosis of severity of the disease for better clinical outcomes.

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