

## Mean Platelet Volume: A Reliable Marker of Inflammation in Recurrent Aphthous Stomatitis and Behçet Disease?

### Abstract

**Background:** Mean platelet volume (MPV) is an indicator of platelet activation and aggregation. MPV has been found to be related with the inflammation of certain disorders in recent studies. **Aims:** We sought to investigate whether MPV could be an indicator of inflammation in patients with Behçet disease (BD) and recurrent aphthous stomatitis (RAS). **Materials and Methods:** Our study was designed as a retrospective case-control study and data was retrieved from our institutional database. We randomly generated a total of three study groups from our clinical archive. All controls were sex and age-matched and randomly selected by computer. Eighty-five patients with BD, 82 patients with RAS, and 721 healthy controls were included for the study design. We compared mean MPV values in the patient groups and controls. **Results:** We found no difference in the mean MPV value between BD group and BD-control group. The mean MPV value was significantly higher in patients with RAS than that in the RAS-control group ( $9.11 \pm 1.01$  fL vs.  $8.76 \pm 1.15$  fL,  $P = 0.045$ ). There was no difference in mean MPV level between BD and RAS group. **Conclusion:** The association between MPV and inflammatory skin diseases such as BD and RAS should be investigated prospectively in case-control studies. **Limitations:** Retrospective study design.

**Keywords:** Behçet disease, inflammation mean platelet volume, recurrent aphthous stomatitis

### Introduction

Mean platelet volume (MPV) is an indicator of platelet activity and aggregation capacity.<sup>[1]</sup> MPV is a crucial variable because larger platelets can be potentially more likely to cause thrombotic events. Elevated MPV value has been found to be associated with atherothrombotic disorders such as atherosclerosis, myocardial ischemia, and cerebrovascular events.<sup>[2]</sup> Recent studies demonstrated that MPV could be used as a diagnostic marker for certain inflammatory disorders.<sup>[3-9]</sup> Behçet disease (BD) is a chronic and multisystemic inflammatory disease of unknown etiology and characterized by recurrent oral and genital ulcerations, uveitis, and skin lesions. Recurrent aphthous stomatitis (RAS) is also an inflammatory disorder with uncertain pathogenesis. We aimed to determine whether MPV could be a diagnostic indicator for BD or RAS.

### Patients and Methods

Eighty-five patients with BD, 82 patients with RAS, and 721 healthy controls were included in the study. All the patients and

controls were sex and age-matched and all the data was evaluated retrospectively. Eighty-five sex and age-matched healthy controls for Behçet patients and 82 sex and age-matched healthy controls for RAS patients were selected randomly from 721 healthy controls in our clinic database. We measured three different comparisons (BD-control, RAS-control, and BD-RAS). Statistical analysis was performed by using SPSS software package (version 15, SPSS Inc., Chicago, IL, USA). We used parametric Student's *t*-test and non-parametric Mann-Whitney U test for the statistical analyses. Values of  $P < 0.05$  were accepted as statistically significant.

### Results

There were 58 female (68.2%) and 27 male (31.8%) patients in BD and BD-control groups. The mean age of the patient and control groups was 34.84 years. The mean MPV values were  $8.87 \pm 1.08$  fL for BD and  $8.81 \pm 1.03$  fL for BD-control groups. No significant difference was found between the BD patients and controls regarding mean MPV values

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( $P = 0.685$  and  $P = 0.897$ ,  $t$ -test and Mann–Whitney U test, respectively) [Tables 1 and 2].

There were 64 females and 18 males in the RAS and RAS-control groups. The mean age was 30.49 years in both groups. The mean MPV values were  $9.11 \pm 1.01$  fL for RAS and  $8.76 \pm 1.15$  fL for RAS-control groups. Mean MPV value was significantly found to be higher in RAS patients ( $P = 0.04$  and  $P = 0.045$ ,  $t$ -test and Mann–Whitney U test, respectively) [Tables 1 and 2].

Regarding BD-RAS comparison, 81 patients were included in each group. There was no statistically significant difference in the mean ages of the both groups. The mean MPV values were  $9.11 \pm 1.01$  fL for AS and  $8.76 \pm 1.15$  fL for AS-control groups. We detected no difference in MPV values between both groups ( $P = 0.233$  and  $P = 0.265$ ,  $t$ -test and Mann–Whitney U test, respectively) [Tables 1 and 2].<sup>[10]</sup>

### Discussion

There are many reports in the literature regarding the relationship between MPV and thrombotic disorders. The recent studies demonstrated that MPV is a marker or an indicator of inflammation and increased in certain inflammatory diseases.<sup>[5,11]</sup> Zubcevic *et al.* reported that MPV showed a statistical significance between mild and moderately severe forms of Crohn’s disease.<sup>[7]</sup> The MPV values in the patients with familial Mediterranean fever were found to be much higher compared to those in controls.<sup>[12]</sup> Soydinc *et al.* reported that MPV levels were significantly elevated in systemic sclerosis patients.<sup>[6]</sup> The MPV value in

patients with psoriasis was found to be significantly higher than that in controls, and a positive correlation between MPV levels and psoriasis area and severity index score was detected.<sup>[3]</sup> Although many studies demonstrated that MPV levels were increased in inflammatory disorders, there are several reports with conflicting or contrary results in the literature. Wang *et al.* reported that a statistically significant decrease in MPV level was noted in patients with periodontitis ( $9.73 \pm 1.06$  fL) compared with healthy controls ( $10.24 \pm 1.07$  fL). The decrease of MPV was found to be associated with severe periodontal inflammation, and the value inversed after periodontal treatment.<sup>[9]</sup>

To the best of our knowledge, the literature includes only two studies examining the relationship between BD and MPV. Cingu *et al.* reported that MPV values were statistically lower in BD group than those in controls.<sup>[13]</sup> On the contrary, Ekiz *et al.* found that MPV levels were statistically higher in BD and RAS groups than the control groups.<sup>[4]</sup> These conflicting results led us to conduct this study. We tried to exclude the possible effects of sex and age variables and selected sex and age-matched random controls. Although we found only a slight statistical difference between RAS and controls, MPV levels could not be used as an indicator or a diagnostic marker for the patients with BD and RAS. However, the association between MPV and inflammatory skin diseases such as BD and RAS should be investigated prospectively in case-control studies.

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### Conflicts of interest

There are no conflicts of interest.

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**Table 1: Comparisons of MPV values with Student’s**

	N	$\bar{x}$	SD	t-test		
				t-test		
				t	MD	P
BD	85	8.8776	1.081	-0.406	-0.0658	0.685
BD control	85	8.8118	1.034			
RAS	82	9.1183	1.158	-2.069	-0.3524	0.04
RAS control	82	8.7659	1.017			
BD	81	8.9086	1.091	-1.197	-0.2123	0.233
RAS	81	9.1210	1.165			

BD: Behçet disease, RAS: Recurrent aphthous stomatitis,  $\bar{x}$ : Arithmetic mean, SD: Standard deviation, MD: Mean difference

**Table 2: Comparisons of MPV values with Mann-Whitney U test**

Groups	N	Mean Rank	Sum of Ranks	Mann-Whitney U	P
BD	85	85.99	7309	3571	0.897
BD-control	85	85.01	7226		
RAS	82	89.93	7374	2752	0.045
RAS-control	82	75.07	6155		
BD	81	77.40	6269	2948	0.265
RAS	81	85.60	6934		

BD: Behçet disease, RAS: Recurrent aphthous stomatitis

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