

Original Article

Assessment of Platelet count changes in patients with Chronic Periodontal Diseases

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ABSTRACT

Objectives: The objective of the study was to determine whether platelets count were changed in patients with chronic periodontitis as compared to healthy subjects. **Methodology:** A total of 154 systemically healthy subjects (73 periodontally healthy and 81 with chronic periodontitis) of age group 25-50 years were selected. Periodontal parameters including Plaque Index (PI), Gingival Index (GI), Pocket Depth (PD), Clinical Attachment Level (CAL) were measured. Venous blood samples were taken to analyze the platelet count. **Result and Conclusions:** The platelet count was higher in subjects with chronic periodontitis as compared to healthy but the result was statistically non significant.

Key words: Periodontitis, platelets count, hematological parameter.

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INTRODUCTION

Periodontal disease is an inflammatory infectious diseases caused by the interaction of plaque bacteria and the host leading to destruction of the alveolar bone and connective tissue supporting the tooth. The primary etiology of periodontal diseases is a group of specific periodontal pathogens, and the host's immunologic and inflammatory response to the bacteria that result in periodontal destruction (Listgarten 1986).¹

Systemic factors modify the periodontal diseases mainly by acting on the normal immune and inflammatory defense cells.

In the past, studies have been conducted regarding whether periodontitis may affect the changes in cellular and molecular components of blood circulation (Loos 2005).²

The studies suggest that the patients with periodontal diseases have elevated levels of systemic inflammation markers including leukocytes (Danesh et al.,1998, Loos et al., 2000)^{3,4} neutrophils, and and C-reactive protein (Schreiber et al.,1982, Loimaala et al.,2006)^{5,6} as compared to healthy individuals. Papapanagiotou et al. have shown that platelets activation have increased in

patients with periodontitis compared with platelets from healthy controls.⁷

The current study was conducted to assess the platelet count in blood of systemically healthy individuals and chronic periodontitis patients.

MATERIALS AND METHODS

The subjects for the study were selected from patients reporting to the Outpatient Department of Periodontics, Faculty of Dental Sciences, Banaras Hindu University (BHU), Varanasi. The study comprised of 154 subjects, inclusive of both sexes, aged between 25 and 50 years, selected on a random basis. The purpose of the study and methodology were explained to the subjects. Those participants who gave written informed consent for the study were included in the study.

Patients with any systemic diseases, pregnant women, those under medication within the past 6 months, smokers and all subjects who have received any periodontal treatment within 6 months before examination, and those having conditions which could aggravate periodontal manifestations were excluded from the study.

Periodontal examination was carried out after selection of subjects. Subjects were divided into two groups based on

the periodontal examination: group I (healthy participant), and Group II (patients with periodontitis). Periodontal examination consisted of Plaque Index (PI), Gingival Index (GI), Pocket Depth (PD), Clinical Attachment Level (CAL). Healthy subjects displayed periodontal pocket depth <3 mm, Clinical attachment loss <3 mm, with no clinical sign of gingivitis. Periodontitis patients exhibited ≥ 4 mm of pocket depth and Clinical attachment loss ≥ 3 mm in more than 30% sites assessed in the oral cavity.

2 ml of venous blood sample were obtained by venipuncture method in the antecubital fossa and stored in vials containing EDTA. The platelet counts were determined by using an automated cell counter within 24 hours after sample collection, at the hematology laboratory of the institution.

Data were analyzed using statistical software, namely, Statistical Package for the Social Sciences (SPSS, Version 16, IBM Analytics). Student t-test was used to analyse the differences between the two groups and $P < 0.05$ was considered statistically significant.

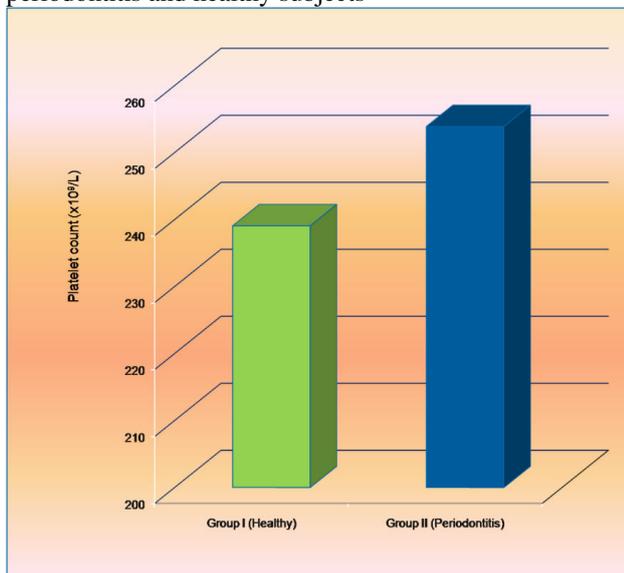
RESULTS

Table 1 shows the mean values of platelet counts in subjects of both the groups. The mean platelet count in the subjects with chronic periodontitis ($253.89 \pm 52.87 \times 10^9$ cells/L) was higher as compared to the healthy group ($239.07 \pm 56.93 \times 10^9$ cells/L). The mean platelet counts are graphically represented in fig 1. The observed difference between the two groups was found to be statistically non-significant.

Table 1: Comparison of Platelet count between groups.

Group	N	Platelet count ($\times 10^9/L$) Mean \pm SD	P Value
Group I (Healthy)	73	239.07 \pm 56.93	0.0960
Group II (Periodontitis)	81	253.89 \pm 52.87	

Figure 1: Bar diagram showing Platelet count in periodontitis and healthy subjects



DISCUSSION

Chronic periodontitis is an infectious disease of the supporting structures of the teeth and is caused by complex, anaerobic, gram-negative specific periodontal bacteria. Periodontal destruction may result from the action of toxic products released from the specific pathogenic bacteria, as well as from the host responses initiated against the periodontal bacteria and their products. The studies suggest that the periodontal diseases increase the risk of systemic conditions like cardiovascular diseases, cerebrovascular diseases, atherosclerosis, and diabetes mellitus.

A total hematological analysis is frequently used to assess the presence of systemic infection or inflammation, and the question arises whether periodontal infections can also affect the hematological parameters such as the differential counts of white blood cells, red blood cells, and platelets count. Some of the studies have demonstrated differences in the hematological parameters in subjects with chronic periodontitis as compared to healthy subjects (Lopez et al., 2012).⁸

In the present study, the mean platelet count in the subjects with chronic periodontitis was $253.89 \pm 52.87 \times 10^9$ cells/L and in healthy subjects was $239.07 \pm 56.93 \times 10^9$ cells/L. The mean platelet count in the subjects with chronic periodontitis was higher as compared to the healthy group but the difference between the two groups was found to be statistically non-significant. The result of this study is in agreement with the previous study done by Al-Rasheed A. and Nicu et al.^{9, 10} This is similar to the previous studies showing an increase in platelet levels and activation in periodontitis patients group (Papapanagioutou et al., 2009⁷; Wakai et al., 1999)¹¹ and the study that demonstrated periodontal treatment results in a lowering of platelet count (Christan et al., 2002).¹² In a study conducted by Lourbakos et al,¹³ It has been concluded that dental plaque bacteria, including the periodontal pathogen Porphyromonas gingivalis, induces platelet activation and aggregation.

CONCLUSIONS:

From the results of the present study, it can be concluded that chronic periodontitis may elevate the levels of platelet counts as compared to healthy control patients and can be considered as one of the mechanisms which explain that periodontitis is linked to the systemic inflammatory conditions.

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