

Correlation between Periodontal Disease and ABO Blood Group - A Case Study

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Abstract: ***Aim:** This study aimed to investigate whether there was a relationship between ABO blood types and periodontal disorders. **Material and Method:** A total of 50 systemically healthy patients aged between 20 to 65 years were selected. Based on periodontal examination (Gingival index, Plaque index, and periodontitis score), subjects were split into three groups: group I (Healthy subjects), group II (subjects with Gingivitis), and Group III (subjects with Periodontitis). ABO Blood grouping was performed via the method called ABO typing. **Results:** Blood group B showed a significantly higher percentage in the periodontitis group while blood group O showed a higher percentage in the gingivitis group. The lowest percentage of periodontal disease was observed in blood group AB. **Conclusion:** Based on the findings of this study, it can be deduced that there is a significant association between blood types and Periodontal disease.*

Keywords: periodontal disease, gingival index, plaque index, clinical attachment level

1. Introduction

Periodontal disease, including gingivitis and periodontitis, is a chronic immune inflammatory response associated with both genetic and environmental factors and may lead to tooth loss if not treated. ^(1, 2) Although bacterial plaque has been implicated as the primary etiology of periodontal disease, several local and systemic factors exist. While systemic factors like diabetes, smoking, and genetic susceptibility may modify and diminish the host's defensive response, local factors may favor plaque formation. Thus, it is important to emphasize the significance of the role of genetic factors in the etiology of periodontal disease and to find any innate factor associated with it. Roberts emphasized the connection between the ABO blood type and vulnerability to chronic illnesses, which is thought to be the genetic basis for inherited susceptibility. ⁽³⁾

The most commonly used blood grouping system is the ABO system that is discovered by Landsteiner and Weiner. ⁽⁴⁾ In order to categorize people into four categories based on whether their red blood cells contained agglutinin A, agglutinin B, neither of the two (O), or both A and B (AB), Landsteiner described the existence of serologic distinctions between individuals. The link between various blood types and periodontal disease was first put forward by Weber and Pastern in 1927. It was then hypothesized that antigens of the ABO system can act as receptors for infectious agents. ⁽⁵⁾

2. Materials and Method

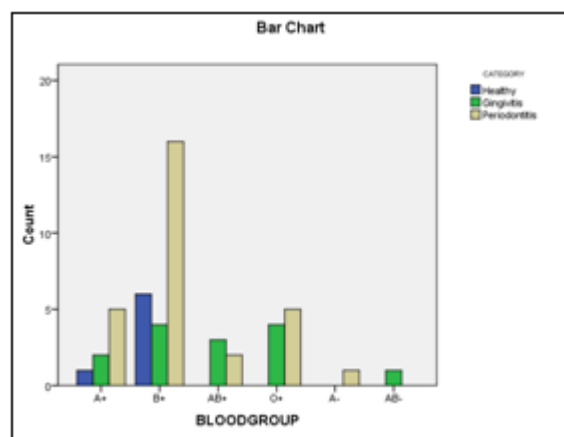
The subjects were selected from the Outpatient Department of Periodontics at ITS Dental College and Hospital, Greater Noida. The study comprised 50 participants, inclusive of both sexes, aged between 20 and 55 years, selected on a random basis. Only those participants who provided consent for the study were included.

Patients who were unable to perform routine oral hygiene, smokers, alcoholics, any previous history of antibiotic therapy, and any periodontal treatment within 6 months prior

to examination were excluded from the study. Subjects with any systemic illnesses or conditions—such as pregnancy, diabetes, etc. that can exacerbate periodontal symptoms were also excluded. Based on a periodontal examination, the participants were classified into three groups: Group I (Healthy participants), Group II (patients with Gingivitis), and Group III (patients with Periodontitis). The periodontal examination consists of the Gingival index, Bleeding index, Probing pocket depth, and clinical attachment level. Healthy participants displayed periodontal pocket depth <3 mm, attachment loss <3 mm, and no clinical sign of gingivitis. The gingivitis patients displayed periodontal pocket depth <3 mm, attachment loss <3 mm, but displayed signs of gingivitis (gingival bleeding, red color gingiva, gingival contour, position, and loss of stippling). Periodontitis patients exhibited at least one site with a periodontal pocket depth of more than 4 mm and attachment loss of more than 3 mm.

3. Results

A total of 50 patients were examined of which 7 were healthy, 14 had gingivitis and 29 had periodontitis. Chi-square analysis resulted in a highly significant association between the ABO blood group and study groups. (Table 1) This data depicts that blood group B+ leaned towards disease while AB+ leaned towards health.



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Table 1: Relation of Healthy, Gingivitis and Periodontitis patients with ABO blood groups

		CATEGORY			Total	
		Healthy	Gingivitis	Periodontitis		
BLOOD GROUP	A+	Count	1	2	5	8
		% within Blood Group	12.50%	25.00%	62.50%	100.00%
	B+	Count	6	4	16	26
		% within Blood Group	23.10%	15.40%	61.50%	100.00%
	AB+	Count	0	3	2	5
		% within Blood Group	0.00%	60.00%	40.00%	100.00%
	O+	Count	0	4	5	9
		% within Blood Group	0.00%	44.40%	55.60%	100.00%
	A -	Count	0	0	1	1
		% within Blood Group	0.00%	0.00%	100.00%	100.00%
	AB -	Count	0	1	0	1
		% within Blood Group	0.00%	100.00%	0.00%	100.00%
Total	Count	7	14	29	50	
	% within Blood Group	14.00%	28.00%	58.00%	100.00%	

4. Discussion

Persistent periodontal infections, such as Gingivitis and Periodontitis, may trigger further tooth loss. Inflammatory periodontal disease is largely caused by dental plaque microorganisms, but host - based risk factors like sex, age, education, oral hygiene, smoking, socioeconomic status, the presence of any systemic diseases, and genetics can affect the way the disease develops. ^(6, 7) The oral ecology and periodontal disease process are impacted by hereditary variables, which raises the possibility that innate factors like blood types are possibly related to periodontal infections, which may act as risk factors for the progression of periodontal diseases. The literature on the relationship between periodontal diseases and the ABO blood group is rather scant.

In this study, blood group O showed a highly significant distribution in gingivitis and group B in the periodontitis group. These findings point towards a possible genetic basis.

Regarding the effects of ABO blood antigens in increasing the risk of periodontal disease, several pathways are taken into consideration. Al Ghamdi et al. ⁽⁸⁾ noted that because many of these bacteria have surface lectins, which they utilize to connect to body surfaces and are frequently ABO specific, the secretion of the ABO antigens into the saliva is likely to impede the ability of bacteria to attach to dental surfaces. Another mechanism by Singh et al ⁽⁹⁾ demonstrated that the antigens of the ABO system also act as receptors for infectious agents. Demir et al. ⁽¹⁰⁾ have noted that different ABO blood groups might exhibit variations in the number of bacteria that are the primary etiologic agents of periodontal disease that are colonized at different rates.

5. Conclusion

Based on the findings of this study, it can be deduced that there is a significant association between blood types and Periodontal disease.

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