

## Association of Severity of Periodontal Disease in Population with Different Blood Groups

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### Original Research Article

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**Abstract:** Periodontal disease is a multifactorial disease with bacteria as the main etiology. Genes clearly play a role in the predisposition to and progression of periodontal diseases. . Blood groups may provide genetic conditions in the occurrence of periodontal diseases and environmental conditions in the improvement of the periodontal pathogens. This study was conducted to determine the association of the ABO blood groups to periodontal diseases to assess whether they could be the predictors of periodontal diseases. In this study a total of 300 patients inclusive of both male and female patients with an age group of 17years to 60 years were participated in the study. All participants were categorized into 3 groups, Group I- Healthy, Group II – Chronic Gingivitis and Group III - Chronic Periodontitis. Each group consisted of 100 subjects and ABO blood groups analysis was done in the 3 groups and also compared blood groups with parameters like plaque index, OHIS index, gingival index, probing depth and clinical attachment level. In this study results showed that the blood group “O” (37%) is more in study subjects followed by blood group “B” (36%) and “A” (22.3%) and the least prevalent was blood group “AB” (4.3%). The blood group B was more prevalent in Group-I (39%) and in Group-II (48%). The blood group “O” is more prevalent in Group-III (54%) respectively. Mean values of plaque index, OHIS index and gingival index in between the study groups I, II and III was found to be statistically significant. The present study indicates that prevalence and severity of chronic periodontitis is more in subject with O group and chronic gingivitis in subjects with B group.

**Keywords:** ABO blood groups, Periodontitis.

### INTRODUCTION

Periodontal diseases are a heterogenous group of pathologies that share common clinical signs and symptoms, chiefly inflammation and destruction of the periodontium. Although it is believed that bacteria are required to develop periodontitis and that certain microbes may be more prevalent in some forms of periodontitis, in most cases specific microorganisms are not sufficient to cause the disease. While microbial and other environmental factors initiate and modulate periodontal disease, individuals are known to respond differently to common environmental challenges and this differential response is influenced by the individual's genetic profile. Genes clearly play a role in the predisposition to and progression of periodontal diseases [1].

The genetic factors may alter oral ecology and the process of periodontal diseases [2]. Several factors may have effect on the qualitative and quantitative improvement of the microorganisms responsible for periodontal diseases. Likewise, ABO blood groups were proved to be effective in the colonization and agglutination of bacteria. Blood groups may provide genetic conditions in the occurrence of periodontal

diseases and environmental conditions in the improvement of the periodontal pathogens.

The ABO blood group system was discovered by Austrian scientist, Karl Landsteiner, who found three different blood types (A, B and O) in 1900 from serological differences in blood called the Landsteiner Law [3]. The earliest attempt to find relationship between the ABO blood groups and disease was by Alexander et al in 1921. He concluded that blood groups B and AB were susceptible to various forms of Neoplasms [4]. Aitchison and Carmichael found out a high percentage of group O and a low percentage of group A in Caries immune individuals and the opposite in Caries rampant group [5].

The ABO system is the most commonly used blood grouping systems. The antigens of the ABO system are an integral part of the red cell membrane, which is also found in plasma and other body fluids. The presence or absence of certain antigens has been associated with various diseases and anomalies, with antigens also acting as receptors for infectious agents [2].

Vivek *et al.*, [6] concluded in his study that blood groups can act as a determinant of periodontitis. One possible mechanism by which individuals of a specific blood group have a lower frequency of periodontal disease could be due to increased levels of antibodies against more strains of periodontitis-causing bacteria. Arati C Koregol *et al.*, [2] study concluded that there is a correlation between periodontal diseases and blood groups, which may act as risk predictors for periodontal diseases. Demir *et al.*, [7] found that different ABO blood groups may show significant differences in the rates of colonization of numbers of periodontal pathogens that are the main etiologic agents of periodontal diseases. Turgut Demir *et al.*, [8] found that a significant relationship was also determined between Rh factor and gingivitis. Hence, ABO blood subgroups may constitute a risk factor on the development of periodontal disease.

Therefore, this study was conducted to determine the association of the ABO blood group with periodontal disease and to know whether they can be risk determinant for detection of periodontal disease.

## MATERIALS AND METHODS

The present study was a cross sectional study. A total of 300 male and female patients within the age group of 17-60 years attending the department of periodontics, Meghna Institute of Dental Sciences, Nizamabad were selected for the study. All the patients were divided into 3 groups of 100 each named Group I – Healthy, Group II – Chronic Gingivitis and Group III – Chronic Periodontitis. Healthy patients with Gingival index scores less than 0.5, Chronic gingivitis with Gingival index scores more than 0.5 and Chronic periodontitis either generalized/ localized with attachment loss  $\geq 3$ mm and probing depth  $\geq 5$ mm were included in the study. The purpose and procedure of the study was explained to the subjects and an informed consent was obtained and permission from Ethical committee was obtained.

### Inclusion criteria

- All subjects should have at least 20 teeth in the mouth.
- They should not receive any periodontal treatment before 6 months of the onset of the study.
- They should not take any antibiotic prophylaxis before 6 months of the onset of the study.
- Non smokers.
- They should have similar socio-economic status.

### Exclusion criteria

- Patient who are not cooperative and reluctant to participate in the study.
- Patient who are alcoholic.
- Patients with history of systemic disease such as diabetes, leukemia, hemorrhagic disorders, metabolic bone disease or epilepsy.
- Pregnant patients.

After selection of subjects, a detailed case history was taken which also included a medical questionnaire pertaining to the periodontal problems, radiographic evaluation was done for bone loss and blood grouping was determined. The clinical parameters included are Plaque Index (PI - Silness and Loe 1964) [25], OHI-S Index (OHI-S - Greene and Vermillion 1964) [26], Gingival Index (GI - Loe and Silness, 1963) [27], Probing Pocket Depth (PPD) and Clinical Attachment Level (CAL). The comparison between the groups and within the group was done as follows

- Comparison of prevalence of ABO blood groups in between the study groups.
- Comparison of prevalence of ABO blood groups within the study group.
- Comparison of Plaque index in between groups – I, II and III.
- Comparison of OHI-S index in between groups – I, II and III.
- Comparison of Gingival index in between groups – I, II and III.
- Comparison of Probing depth in group III between ABO blood groups.
- Comparison of Clinical attachment loss in group III between ABO blood groups.

Blood groups were determined using Slide agglutination method. Patients finger was pricked with a sterile lancet and two drops of blood placed on a slide to which anti - A and anti - B serum was added separately and waited for clumping to take place.

The values were normally distributed / parametric values. So the quantitative data was summarized using mean values. Parameters were analyzed using Chi-square test, ANOVA and Post Hoc test.

## RESULTS

In this study, ABO blood groups was compared between the groups, within the groups and also assessed with clinical parameters such as Plaque Index, OHI-S Index, Gingival Index, Probing Pocket Depth and Clinical Attachment Level.

### Comparison of prevalence of abo blood groups in between the study groups (Figure-1, 2, 3 and 4)

When subjects in group I (Healthy group) assessed for blood groups the % distribution was found to be 39% for O and B blood group, 18% for A blood group and 4% for AB blood group. When subjects in group II (Chronic Gingivitis) was assessed for blood groups the % distribution was found to be 48% for B blood group, 29% for A blood group, 18% for O blood group and 5% for AB blood group. When subjects in group III was assessed for blood groups the % distribution was found to be 54% for O blood group, 22% for B blood group, 20% for A blood group and 4% for AB blood group. When overall subjects were

assessed for blood groups the % distribution was found to be 37% for O blood group, 36% for B blood group, 22.3% for A blood group and 4.3% for AB blood group.

#### **Comparison of plaque index in between groups – i, ii and iii (figure-5)**

When mean PI scores were assessed between the 3 groups the results were found to be mean value was 1.0464 (standard deviation .38957) for group I, mean value was 1.4872 (standard deviation .36115) for group II and mean value was 1.5196 (standard deviation .35067) for group III. When ANOVA test was done for 3 groups the value was found to be  $F= 51.742$  with  $p$  value 0.00 ( $p<0.05$ ) showed statistically significant difference between the groups.

#### **Comparison of ohi-s index in between groups – i, ii and iii (figure-6)**

When mean OHI-S scores were assessed between the 3 groups the results were found to be mean value was 1.5503 (standard deviation .56930) for group I, mean value was 3.7680 (standard deviation .73220) for group II and mean value was 3.5877 (standard deviation .81639) for group III. When ANOVA test was done for 3 groups the value was found to be  $F= 298.082$  with  $p$  value 0.00 ( $p<0.05$ ) showed statistically significant difference between the groups.

#### **Comparison of gingival index in between groups – i, ii and iii (figure-7)**

When mean OHI-S scores were assessed between the 3 groups the results were found to be mean value was 0.3930 (standard deviation .6568) for group I, mean value was 1.6681 (standard deviation .27644) for group II and mean value was 1.4881 (standard deviation .30621) for group III. When ANOVA test was done for 3 groups the value was found to be  $F= 818.790$  with  $p$  value 0.00 ( $p<0.05$ ) showed statistically significant difference between the groups. Probing depth and clinical attachment level were assessed in subjects with different blood groups in group III.

#### **Comparison of probing depth in between different blood groups in group iii (figure-8)**

When mean probing depths were compared in subjects with different blood groups in group III the results showed mean value for A blood group is 3.755 (standard deviation 1.3014), mean value for B blood group is 5.539 (standard deviation .58620), mean value for AB blood group is 5.015 (standard deviation .5015) and mean value for O blood group is 6.075 (standard deviation .7516). when these mean probing depth values were compared in subjects with different blood groups in group III using ANOVA test the value found

to be  $F= 3.892$  ( $p<0.05$ ) showed statistically significant difference between blood groups in group III.

#### **Comparison of mean number of probing sites in between different blood groups in group iii (figure-9)**

When mean number of probing sites were compared in subjects with different blood groups in group III the results showed mean no of sites for A blood group is 17.6153 (standard deviation 3.2468), mean no of sites for B blood group is 20.1818 (standard deviation 6.5416), mean no of sites for AB blood group is 25.33 (standard deviation 8.250) and mean no of sites for O blood group is 14.6808 (standard deviation 4.7860). when these mean no of probing depth sites were compared in subjects with different blood groups in group III using ANOVA test the value found to be  $F= 3.892$  ( $p<0.05$ ) showed statistically significant difference between blood groups in group III.

#### **Comparison of clinical attachment level in between different blood groups in group iii (figure-10)**

When mean clinical attachment level were compared in subjects with different blood groups in group III the results showed mean value for A blood group is 3.172 (standard deviation 1.616), mean value for B blood group is 4.122 (standard deviation .651), mean value for AB blood group is 3.746 (standard deviation .510) and mean value for O blood group is 3.914 (standard deviation .692). When these mean clinical attachment level values were compared in subjects with different blood groups in group III using ANOVA test the value found to be  $F= 0.431$  ( $p>0.05$ ) showed no statistically significant difference between blood groups in group III.

#### **Comparison of mean number of sites for clinical attachment level in between different blood groups in group iii (figure-11)**

When mean number of sites for clinical attachment level were compared in subjects with different blood groups in group III the results showed mean no of sites for A blood group is 15.450 (standard deviation 5.486), mean no of sites for B blood group is 22.8181 (standard deviation 4.9274), mean no of sites for AB blood group is 20.250 (standard deviation 4.600) and mean no of sites for O blood group is 16.500 (standard deviation 6.888). when these mean no of probing depth sites were compared in subjects with different blood groups in group III using ANOVA test the value found to be  $F= 233.873$  ( $p<0.05$ ) showed statistically significant difference between blood groups in group III.

**Fig-1: Comparison of prevalence of ABO blood groups in between the study groups**

Blood Group * Group Cross tabulation			Group			Total	$\chi^2$ value p value
			Healthy Individuals	Gingivitis Patients	Periodontitis Patients		
BLOOD GROUP	A	Count	18	29	20	67	$\chi^2 = 32.460$ p = 0.000
		% within BLOOD GROUP	26.9%	43.3%	29.9%	100.0%	
		% within GROUP	18.0%	29.0%	20.0%	22.3%	
	B	Count	38	48	22	108	
		% within BLOOD GROUP	35.2%	44.4%	20.4%	100.0%	
		% within GROUP	38.0%	48.0%	22.0%	36.0%	
	AB	Count	4	5	4	13	
		% within BLOOD GROUP	30.8%	38.5%	30.8%	100.0%	
		% within GROUP	4.0%	5.0%	4.0%	4.3%	
	O	Count	39	18	54	111	
		% within BLOOD GROUP	35.1%	16.2%	48.6%	100.0%	
		% within GROUP	39.0%	18.0%	54.0%	37.0%	
		Count	1	0	0	1	
		% within BLOOD GROUP	33.3%	33.3%	33.3%	100.0%	
		% within GROUP	100.0%	100.0%	100.0%	100.0%	

**Fig-2: Prevalence of ABO blood groups in group I**

		Frequency	Percent	Cumulative Percent
Valid	A	18	18.0	18.0
	B+VE	40	40.0	58.0
	AB+VE	4	4.0	60.0
	O+VE	39	39.0	99.0
	Total	100	100.0	

**Fig-3: Comparison of prevalence of ABO blood groups in Group II**

		Frequency	Percent	Cumulative Percent
Valid	A	29	29.0	29.0
	B	48	48.0	77.0
	AB	5	5.0	82.0
	O	18	18.0	100.0
	Total	100	100.0	

**Fig-4: Comparison of prevalence of ABO blood groups in Group III**

		Frequency	Percent	Cumulative Percent
Valid	A	20	20.0	20.0
	B	22	22.0	42.0
	AB	4	4.0	46.0
	O	54	54.0	100.0
	Total	100	100.0	

**Fig-5: Comparison of plaque index in between groups – I, II and III**

	N	Mean	Std. Deviation	95% Confidence Interval for Mean		F (ANOVA)
				Lower Bound	Upper Bound	
Healthy Individuals	100	1.0464	.38957	.9691	1.1237	F = 51.742 p value = 0.00
Gingivitis Patients	100	1.4872	.36115	1.4155	1.5589	
Periodontitis Patients	100	1.5196	.35067	1.4500	1.5892	
Total	300	1.3511	.42531	1.3027	1.3994	

**Fig-6: Comparison of OHI-S index in between groups – I, II and III**

	N	Mean	Std. Deviation	95% Confidence Interval for Mean		F (ANOVA)
				Lower Bound	Upper Bound	
Healthy Individuals	100	1.5503	.56930	1.4373	1.6633	F = 298.082 p value = 0.00
Gingivitis Patients	100	3.7680	.73220	3.6227	3.9133	
Periodontitis Patients	100	3.5877	.81639	3.4257	3.7497	
Total	300	2.9687	1.23296	2.8286	3.1088	

**Fig-7: Comparison of Gingival index in between groups – I, II and III**

	N	Mean	Std. Deviation	95% Confidence Interval for Mean		F (ANOVA)
				Lower Bound	Upper Bound	
Healthy Individuals	100	.3930	.06568	.3800	.4060	F = 818.790 p value = 0.00
Gingivitis Patients	100	1.6681	.27644	1.6132	1.7230	
Periodontitis Patients	100	1.4881	.30621	1.4273	1.5489	
Total	300	1.1831	.61347	1.1134	1.2528	

**Fig-8: Comparison of probing depth in between different blood groups in Group III**

	N	Mean	Std. Deviation	95% Confidence Interval for Mean		F (ANOVA)
				Lower Bound	Upper Bound	
A	13	3.755	1.30146	2.183	5.572	F = 3.892 p value = 0.011
B	22	5.539	.58620	5.038	6.252	
AB	3	5.015	.17059	4.202	5.653	
O	47	6.075	.65011	5.025	7.056	
Total	85	5.098	.75168	4.036	6.161	

**Fig-9: Comparison of mean number of probing sites in between different blood groups in Group III**

	N	Total No. Of Sites	Mean No. Of Sites	SD	F
A	13	229	17.6153	3.2468	F = 196.234 p value = 0.034
B	22	444	20.1818	6.5416	
AB	3	76	25.3333	8.2500	
O	47	690	14.6808	4.7860	
Total	85	1439	19.4528	5.4620	

**Fig-10: Comparison of clinical attachment level in between different blood groups in Group III**

	N	Mean	Std. Deviation	95% Confidence Interval for Mean		F (ANOVA)
				Lower Bound	Upper Bound	
A	20	3.172	1.616	0.911	4.933	F = 0.431 p value = 0.731
B	22	4.122	.651	2.944	5.272	
AB	4	3.746	.510	2.793	4.691	
O	54	3.914	.692	2.410	5.281	
Total	100	3.738	.931	2.207	5.147	

**Fig-11: Comparison of mean number of sites for clinical attachment level in between blood groups in group III**

	N	Total no. of sites	Mean No. Of Sites	SD	F
A	20	309	15.4500	5.4860	F = 233.873 P value = 0.042
B	22	502	22.8181	4.9274	
AB	4	81	20.2500	4.6000	
O	54	891	16.5000	6.8880	
Total	100	1783	17.8300	5.5690	

## DISCUSSION

Periodontitis is a multifactorial disease with microbial dental plaque as the initiator of periodontal disease. However, the manifestation and progression of periodontitis is influenced by a wide variety of determinants and factors, including subject characteristics, social and behavioral factors, systemic factors, genetic factors, tooth level factors, microbial composition of dental plaque and other emerging risk factors [9]. Chronic periodontitis is the most frequently encountered in the adult population [10].

Weber and Pastern were the first who studied the association of ABO blood group with periodontal disease. Faser Roberts, discussed the relationship between ABO blood group and susceptibility to chronic disease as an example of genetic basis for family predisposition [11].

Scanty literature is available regarding the relationship between ABO blood groups and the incidence of oral and dental diseases [12].

In the present study out of 300 patients, 67 patients with 22.3% belonged to blood group A, 108 patients with 36% belonged to blood group- B, 13 patients with 4.3% belonged to blood group-AB, 111 patients with 37% belonged to blood group-O. Blood group O is predominant, followed by B, A and the least was AB blood group. This distribution pattern is more similar to studies done in Vellore, Chittoor, Karnataka, and Jammu and Kashmir. Also studies done in other countries like Nigeria-delta, Australia, Britain, USA showed O blood group in common followed by blood groups B,A, and AB blood group was the least prevalent [13].

ABO blood groups and various study groups of periodontal involvement i.e., Group I (Healthy), Group II (Chronic gingivitis) and Group III (Chronic periodontitis) were compared using Chi-square test analysis of variance, there was a highly significant (P value = 0.000) difference found between ABO blood groups and periodontal status.

In Group I (Healthy Group), out of 100 patients in this group, 18 patients (18%) belonged to blood group A, 39 patients (39%) belonged to blood group B, 4 patients (4%) belonged to blood group AB, 39 patients (39%) belonged to blood group O. Statistical analysis showed that, blood group B and O had nearly equal distribution of patients relatively more prevalent in Healthy group. This study was in accordance with a study done by Kaur M [14].

In Group II (Chronic gingivitis Group), out of 100 patients in this group, 29 patients (29%) belonged to blood group A, 48 patients (48%) belonged to blood group B, 5 patients (5%) belonged to blood group AB, 18 patients (18%) belonged to blood group O.

Statistical analysis showed that blood group B is relatively more prevalent in Chronic gingivitis group. These findings support the study of Anirban Chaterjee [15] and Mortazavi [16].

In Group III (Chronic periodontitis Group), out of 100 patients in this group, 20 patients (20%) belonged to blood group A, 22 patients (22%) belonged to blood group B, 4 patients (4%) belonged to blood group AB, 54 patients (54%) belonged to blood group O. Statistical analysis showed that, blood group O is relatively more prevalent in Chronic periodontitis group. This finding corresponded to the findings of other studies done by Koregal *et al.*, [2], Anirban Chaterjee [15], Hassan and Demir *et al.*, [7], Vivek *et al.*, [6], Gawrzewska [17], Humagain *et al.*, [18] and Balaji Ramamoorthy [19].

In the present study comparison of plaque index between study groups I, II and III, mean values of plaque scores in between the study groups I, II and III was found to be statistically significant. Individual comparison was done and it showed significant differences between healthy, gingivitis and periodontal patients, with periodontal patients showing highest mean plaque score followed by gingivitis patients and least for healthy patients. The plaque scores between Group II and III showed no significant difference statistically ( $p > 0.05$ ), however, difference in the mean plaque score between healthy individuals and periodontal patients and gingivitis patients were found to be statistically significant ( $p < 0.05$ ). These findings were also similar to the study done by Ghamdi [11].

Mean values of OHI-S index between study groups I, II and III in the present study was found to be statistically significant. When individual group comparison was done it showed significant differences between healthy, gingivitis and periodontal patients with gingivitis patients showing highest mean OHI-S index score followed by periodontitis patients and least for healthy individuals.

Upon comparison of Gingival index in between groups I, II and III, mean values of Gingival index scores in between the study groups was found to be statistically significant with gingivitis patients showing highest mean Gingival index score followed by periodontitis patients and least for healthy individuals.

In the present study, probing pocket depth when compared in group III, mean values of probing depth in between the ABO blood groups showed statistically significant with the highest mean number of probing depth was found among patients with O- blood group, followed by B- blood group and AB blood groups and least mean probing depth was seen in A- blood group. When number of sites for probing pocket depth was compared, the highest mean number of

probing sites was found among patients with AB- blood group, followed by B- blood group and A- blood group. O- blood group participants showed the least mean number of probing sites. These differences were found statistically significant ( $P < 0.05$ ). This is in accordance with the study done by Humagain *et al.*, [18].

Clinical attachment level in the present study showed difference between the groups in terms of mean clinical attachment levels which was found to be not statistically significant. The highest mean clinical attachment levels were found in B- blood group followed by O- and AB blood groups. Least values were observed in A- blood group showing differences in the mean values among different blood groups. However, these differences were not found to be statistically significant. When number of sites for clinical attachment level was compared, the highest mean numbers of sites were found in B- blood group followed by AB- blood group patients. O- and A- blood group showed the least values providing a major difference in the mean number of sites for clinical attachment level among different blood groups. These differences were also found to be statistically significant. This is in accordance with the study done by Humagain *et al.*, [18] and Ghamdi [11].

The clinical significance of ABO blood group is not only limited to transfusion medicine and solid organ transplantation but also the association between some diseases and the ABO blood groups has been proved during the recent decades and there are known associations between approximately 70 diseases and the ABO blood groups [20]. Analysis of epithelial blood group substances has been shown to be useful in studies of cell differentiation of normal oral epithelium and in conditions of premalignancy, malignancy, and wound healing [21]. According to Marcus, there is a statistically significant association between certain blood group phenotypes and increased susceptibility to a number of diseases. The earliest attempt to find relationship between the ABO blood groups and disease was by Alexander *et al* in 1921.

Secretors with blood group A, B or AB secrete A, B or A and B antigens but subjects with blood group O secrete H antigen because of biochemical conversion of the blood group core structure [22]. The secretion of group specific substances is governed by Mendelian dominant inheritance, the gene is designated as Se, and the subjects are called as secretors, while the non secretor character is governed by the recessive gene designated as se [23].

Bacterial plaque is considered the primary extrinsic etiologic agent in periodontal disease. The adherence of bacterial plaque is the dominant mechanism allowing initial colonization. Adherence of some bacteria is inhibited by secretory IgA which is

part of the oral immunologic defense system. Salivary anti-A and anti-B are among the secretory IgA antibodies. Some bacterial cell walls contain substances with close serological relationships to A and B erythrocyte antigens. Salivary anti-A and anti-B could agglutinate such bacteria preventing bacterial adherence, subsequent bacterial colonization and the development of periodontal disease. Patients of blood group O have anti-A and anti-B in their sera and could have both antibodies in their saliva. High antibody titers might be due to result of periodontal disease or due to protective mechanism against the disease [24].

Gawrzewska found individuals of blood group O to have greater severity of periodontal diseases, but individuals of blood group A to have greater resistance to periodontal diseases [17].

Suk found that ABO blood types had an increased effect on the risk for the development of oral diseases. Pradhan *et al* also found significant differences when ABO blood groups were related to four grades of periodontal involvement. On the contrary, Barros and Witkop stated that there were no significant differences between subjects with or without periodontal diseases regarding ABO blood group [7].

The presence or absence of certain antigens has been associated with various diseases and anomalies, with antigens also acting as receptors for infectious agents. This study provides new insight into the role of the immune system in maintaining health and combating disease, not only in the periodontium but also in the other tissues<sup>2</sup>.

It is difficult to propose a specific reason, why patients with particular blood group are found in increased frequency in Healthy, Gingivitis and Chronic periodontitis particularly. Possible mechanisms regarding the effects of ABO blood group antigens in developing risk of periodontal disease are [16]:

- Antigens of the ABO blood group system, also act as receptors for infectious agents (Singh).
- Secretion of ABO antigens into the saliva *i.e.*, Secretor status probably inhibits the ability of bacteria to attach to teeth surfaces *i.e.*, bacterial aggregation and thus biofilm formation. This is because many of these bacteria have surface lectins, which they use to attach to body surface and are often ABO specific (Al Ghamdi).
- The ABO specificity of different bacteria is well-established and antibody titers to those specificities vary with the host blood type. Specific antibody secretion would be expected to be low or undetectable to antigens recognized as “self” and perhaps, more importantly, high to antigens recognized as “non-self”.

### Limitations of the present study

Indepth of knowledge studies should be done at molecular level to find out the relation between severity of periodontal disease with different blood groups.

### CONCLUSION

Genetic differences in antigen presentation may contribute to certain diseases. The genetic factors may alter the oral ecology and plays a role in the etiopathogenesis of periodontal diseases. This association can be due to various blood group antigens acting as receptors for infectious agents associated with periodontal disease. Thus by the above findings and within the limitations of the study, there is a correlation existing between the ABO blood groups and periodontal diseases in this geographic location. Hence it can be concluded that ABO blood groups could constitute a possible risk determinant for the development of periodontal disease. However, further longitudinal studies upon larger population and a more specific method of detection should be done at molecular level to assess the relationship between severity of periodontal disease and with different blood groups.

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