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RESEARCH ARTICLE

EVALUATION AND COMPARISON OF THE ASSOCIATION BETWEEN ABO BLOOD GROUPS AND SEVERITY OF CHRONIC PERIODONTITIS

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ABSTRACT

Periodontitis is an inflammatory disease of the supporting tissues of the teeth caused by specific microbes, resulting in progressive destruction of the periodontal ligament and alveolar bone in the oral cavity. The ABO blood groups in determining the susceptibility to various diseases have long been a subject of debate and periodontitis is one among them. Till date very few studies have been conducted to determine the association between ABO blood group and severity ofperiodontitis The aim of the study was to evaluate and Compare the association between ABO blood Groups and severity of Chronic Periodontitis. On oral examination, plaque index, gingival index, pocket probing depth, clinical attachment loss and the number of missing teeth were recorded. The blood group investigation was carried out by slide agglutination method.Analytical statistics were done. The Kolmogorov-Smirnov test was used for testing normality of data. The non-parametric Kruskal-Wallis test was used to check differences between the groups.66 Post hoc comparisons were done using Dunn-Bonferroni test.67 The chi-square test was used to check differences in proportions between groups.

Software: SPSS (Statistical Package for Social Sciences) Version 20.1(Chicago, USA Inc.) There was a significant association of blood group 'B' with mild and moderate periodontitis and of blood group ' O' with severe periodontitis (p =0.024).

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INTRODUCTION

Periodontitis is an inflammatory disease of the supporting tissue of the teeth caused by specific microbes or groups of specific microbes, resulting in progressive destruction of the periodontal ligament andalveolar bone on the oral cavity (Newman, 2007). It is one of the most prevalent diseases affecting large number of individuals worldwide. The World Health Organization (WHO) reported that around 10 – 15 % of the worldpopulation suffer from severe periodontitis (Petersen, 2005). Blood is a specialized tissue which performs the vital function of picking up and delivering different metabolic substances. It plays an important role in the maintenance of a healthy periodontium (Newman, 2007). Karl Landsteiner discovered the existence of serologic differences between individuals, which led to the classification into one of four groups depending on whether their red cells (RBC's) containedagglutinogen 'A', agglutinogen'B', neither 'A' nor 'B' (o) or both A and B (AB) in 1900s (Skripal, 1996). Since then, the ABO blood group has become most important blood typing system, as the determinant for transfusion reaction and organ transplantation.

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The ABO blood type system has significance beyond transfusion and transplantation, as, for example, it determines immunological characteristics of the body.[4]The role of ABO blood groups in differential susceptibility to various diseases has long been a subject of debate (Roberts, 1957). Faster Roberts was first todescribes the relationship of ABO blood group with the susceptibility tochronic diseases as an examples of genetic basis for familial predisposition (Chakravarti, 1977). In India and various western countries, may researches carried out studies showing the relationship between ABO blood group and various systemic diseases such as chicken pox (Singh *et al*., 1995), malaria (Glober, 1971), gastric cancer (Janardhan, 1951), hematological malignancies (Whincup *et al*., 1990), ischemic heart disease (Viskum, 1975), pulmonary tuberculosis (Shankar, 2002), dandruff (Choi, 2004), osteoporosis (Gangopadhyay, 2006) dermatitis (Smith, 1994), Studies demonstrated that individuals with blood group Oare more susceptible for peptic ulcers (Skaik, 2009). Diabetes mellitus and Cardiovascular diseases are more common in individuals with blood group A and respectively (Okon *et al*., 2008; Weber, 1971). A plethora of studies have been conducted in the medical field. Till date in literature, very few studies have been conducted to determine the relationship between ABO blood group and oral diseases.

The antigens of the ABO blood groups systems are an integral part of the RBC's membrane and they are also found in body fluids including saliva. Weber and Pastern were the first to study the relationship between ABO blood group and periodontal disease (Kaslick, 1980). Kaslick and coworkers studied the relationship between blood group and aggressive periodontitis (Koregol *et al*., 2000). Koregol *et al* in a study concluded that individuals with blood group 'A' (32.8%) were significantly higher in the gingivitis group and those with blood group 'O' (32.8%) were higher in the periodontitis group (Pai *et al*., 2012). In a recent study, it was observed that blood group 'B' (67.9%) and 'A' (64.4%) showed inclination toward diseased periodontium. Thus, the purpose of the present study was to evaluate and compare the distribution of different ABO groups in the study group and to determine the association between ABO blood groups and severity of periodontal disease. The knowledge of the ABO blood groups of patients and their association, if any, with the severity of chronic periodontitis may be important in the development of early treatment strategies for prevention and treatment of periodontal diseases in highly susceptible individuals

AIMS AND OBJECTIVES

The aim of the study was to evaluate and compare the association between ABO blood groups and severity of chronic periodontitis.

OBJECTIVES

- To determine the blood groups among the study population.
- To assess the association between ABO blood groups and severity of chronic periodontitis

MATERIALS AND METHODS

source of data

The study was a cross sectional in design. It was conducted in the Outpatient department (OPD) of Department of Periodontics Dr DY Patil School of dentistry, Nerul, Navi Mumbai. Study group comprised of 300 subjects, within the age group of 25-55 years of either sex, who met theinclusion criteria. They were divided into groups as follows:

Chronic periodontitis subjects (n-300): Subjects who had clinical attachment loss more than 1-2 mm and periodontal pockets depth > 4mm. They were further divided into three groups according to World Work Shop 1999 classification of periodontal disease (Peter, 2004).

- Mild Periodontitis (1-2 mm of CAL) – 100 patients.
- Moderate Periodontitis (3-4 mm of CAL) – 100 patients
- Severe Periodontitis (5mm or more of CAL) – 100 patients

INCLUSION CRITERIA

- Subjects with age group between 25 to 55 years.
- Subjects having at least 20 teeth, excluding the third molars.
- Subjects with a good state of health without any systemic disorders.

Exclusion Criteria

- Subjects with history of any systemic disorders or conditions such as
- Diabetes, leukemia, Pregnancy, metabolic bone disease or Epilepsy.
- Subjects with habits like Smoking and tobacco chewing.
- Administration of medications such as antibiotics, steroids, or nonsteroidal anti-inflammatory drugs 3 months before entering the
- study.
- Subjects who have undergone any periodontal therapy 6 months prior to the study.
- Patients who were unable to perform routine oral hygiene.
- 6.Aggressive Periodontitis Patients.

Clinical Armamentarium

- Mouth mirror
- Tweezer
- Straight probes.
- Disclosing agent(Plaksee disclosing tablets)
- UNC-15 periodontal probe (Hu-Friedy).
- Disposable gloves.
- Disposable mouth mask.
- Kidney tray.

LABORATORY MATERIALS

- Surgical sprit
- Cotton swab and gauze
- Sterile disposable lancet
- Glass slide
- Blood grouping kit."AGAPEE"
- (AGAPPE Diagnostic LTD, India)

METHODOLOGY

- Informed written consent was obtained from al the study subjects
- before starting the study.
- Demographic data of the study subjects was recorded.
- Oral examination was carried out by single examiner for all the study
- subjects and plaque index, gingival index, pocket probing depth,
- clinical attachment loss and the number of missing teeth were recorded.

INDICES

***Plaque index* (Sillness&Loe 1964)**

The surfaceexamined are four gingival areas of the tooth i.e. the distalfacial, facial, mesial- facial, lingual surfaces. A dental explorer or probe is passed across the tooth surface in the Cervical third and near the sulcus.

The scoring criteria are as follows:

Score 0 = No plaque.

Score 1 = A film of plaque adhering to the free gingival margin and adjacent area of the tooth. The plaque may be seen in situ only after application of disclosing solution or by using the probe on the tooth surface.

Score 2 = Moderate accumulation of soft deposits within the gingival pocket, or on the tooth and gingival margin which can be seen with the naked eye.

Score 3 = Abundance of soft matter within the gingival pocket and/or on the tooth and gingival margin. The scores from the four areas of the tooth are added and then divided by four to obtain the plaque index for a tooth.

The indices for each of the teeth are added and then dived by the total number if teeth examined. This provides the plaque index for the individual.

Gingival index **(Loe and Silllness, 1963) (Mohan, 2007)**

SCORE RATING

0 Excellent
0.1-0.9 Good
1.0-1.9 Fair
2.0-3.0 Poor.

The tissues surrounding each tooth are divided into four gingival scoring units i.e. disto-facial Papilla, facial margin, mesio-facial papilla and the entire lingual gingival margin. A probe is used to assess the bleeding on probing (BOP).

The scoring criteria are as follows:

Score 0 = Absence of inflammation/normal gingival.

Score 1 = Mild inflammation. Slight change in color, slight edema, no bleeding on probing.

Score 2 = Moderate inflammation, redness, edema and glazing, bleeding on probing.

Score 3 = severe inflammation, marked redness and edema, ulceration, tendency to spontaneous bleeding.

The scores from the four areas of the tooth are added and then divided byfour to obtain the Gingival index for a tooth. The indices for each of the teeth are added and then divided by the Total number of teeth examined. This provides the gingival index for the individual.

Measurements of Periodontal Probing depths

The periodontal pocket depths were measured from the crest of the marginal gingival to the base Of the gingival sulcus/pocket using William's periodontal probe.

Measurements of Clinical attachments loss(CAL) (Mohan, 2007)

"Clinical attachments loss is the distance from the cemento enamel junction to the base of the gingival crevice or pocket."

Variation in CAL

When gingival margin is located on anatomic crown:

CAL = PD – (gingival margin to CEJ)

When gingival margin coincides with CEJ

CAL = PPD

When gingival margin is located apical to CEJ. i.e. recession

CAL = PD + (gingival margin to CEJ)
Severity of chronic periodontitis can be assessed based on the amount of clinical attachment loss as follows: [23]

- Mild Periodontitis = 1-2 mm of CAL
- Moderate Periodontitis = 3-4 mm of CAL
- Severe Periodontitis = 5mm or more of CAL

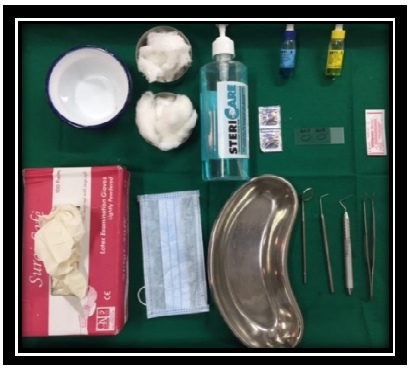
ABO blood grouping: Tip of index finger was wiped with surgical spirit, before blood collection. The finger tip was pricked with a disposable lancet for collection of the blood. After collection of blood, pressure was applied on the finger tip with a cotton swab to stop the bleeding. The ABO blood group grouping was carried out by slide agglutination method (visual method) (Page, 1997).

One drop of Anti- A and anti-B serum was placed on two separate areas on adisposable glass slide. Then, a drop of blood was mixed with Anti-A and anti-Bserum using a wooden stick or with the end of a glass slide. Agglutination was checked after five minutes.

Interpretation of ABO blood groups

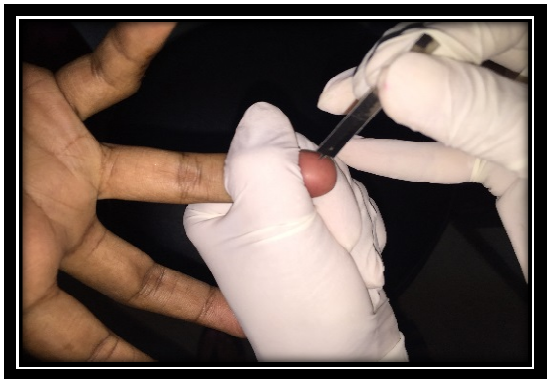
The interpretation of ABO blood groups was based on agglutination. Agglutination was visible with naked eye as dark reddish lumps of different sizes.Following criteria was used for interpretation of ABO blood groups:

Colour Plate

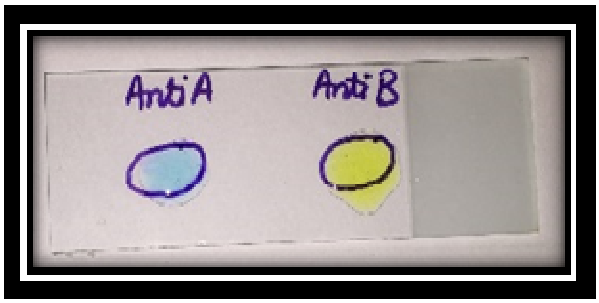


Armamentarium used for the study

Anti serum A and B

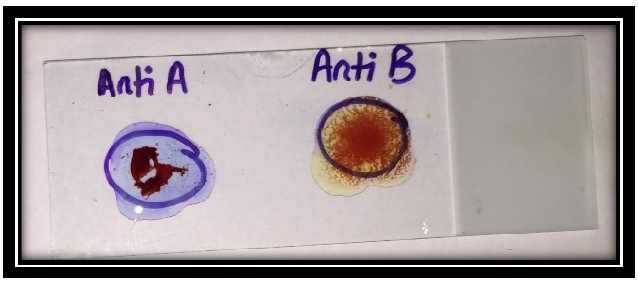


Finger prick method for collection of blood sample

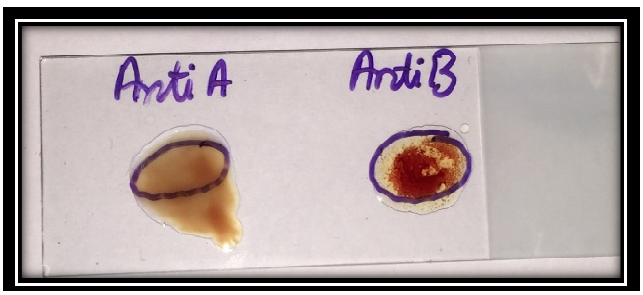


Anti serum A and B on Glass slab

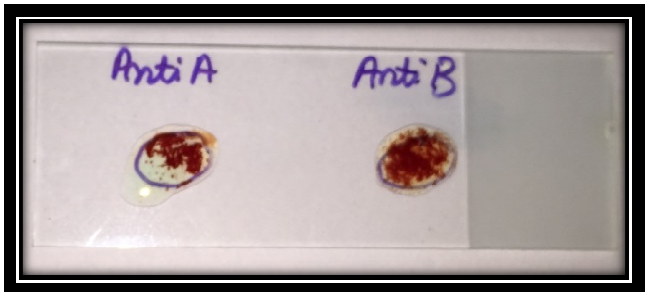
Agglutination procedure with anti serumA and B- Blood Grouping



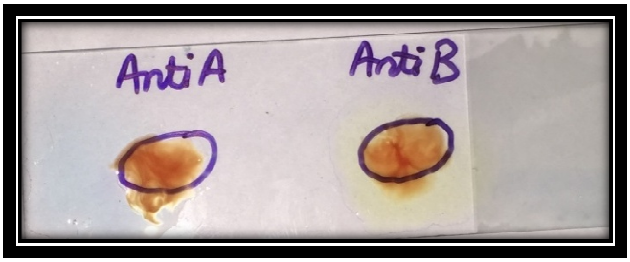
Blood group A



Blood Group B



Blood Group AB



Blood Group O

Output Tables and Graphs

The blood group is "A", if agglutination occurred onto the slide to which anti-A was added.

The blood group is "B", if agglutination occurred onto the slide towhich anti-B was added.

The blood group is "AB", if agglutination occurs onto the slide towhich anti-A and anti-B was added.

The blood group is "O", if agglutination occurs onto the slide to which
Anti-A and Anti-B was added (Page, 1997).

RESULTS

According to the selection criteria, 100 each were included in mild, moderate and severe periodontitis group making a total of 300 participants. The mean age of study population was 37.44 ±6.91 years (Table 1).

Table 1. Age description of the study population

Variable	N	Mean	S.D.	S.E.	95% C.I.
Age	300	37.44	6.91	0.39	36.62-38.18

Table 2. Frequency distribution of gender among the study population

Sex	N	Per cent (%)
Male	182	60.7
Female	118	39.3

Table 3. Frequency distribution of blood groups among the study population

Groups	N	Per cent (%)
A	82	27.3
B	129	43.1
AB	13	4.3
O	76	25.3

Table 4. Frequency distribution of gender among blood groups

Variables	N	Statistic	P-Value
Age	300	0.101	0.000*
PI	300	0.149	0.000*
GI	300	0.166	0.000*
PPD	300	0.221	0.000*
CAL	300	0.163	0.000*

Table 5. Test results for normality of data among variables Normality checked by Kolmogorov-Smirnovtest

Groups		Male	Female	Chi-Square	P-Value
A	n	57	25	25.839	0.000
	%	69.5	30.5		
B	n	58	71		
	%	45.0	55.0		
AB	n	12	1		
	%	92.3	7.7		
O	n	55	21		
	%	72.4	27.6		

significant at p < 0.005

The study population had a higher percentage of males (60.7%) than females (Table 2). The frequency distribution of blood groups among the study population is shown in Table 3. There were 27.3% in blood group A, 43.1%, 4.3% and 25.3% in B, AB and O blood groups respectively. The distribution of gender among blood groups is uneven (p=0.000) (Table 4). To check the normality of data (age, PI, GI, PPD, and CAL) Kolmogorov-Simrnov test was used. It was found that these data does not follow normal distribution (Table 5).

Table 6. Comparison of mean age of study population among blood groups

Groups	N	Mean	S.D.	S.E.	95% C.I.	P-Value
A	82	38.30	6.28	0.69	36.90-39.58	0.004*
B	129	36.11	6.50	0.57	34.94-37.19	
AB	13	35.30	6.04	1.67	32.05-38.73	
O	76	39.14	7.89	0.90	37.34-40.85	

Table 7. Comparison of mean plaque index (PI) scores among blood groups

Groups	N	Mean	S.D.	S.E.	95% C.I.	P-Value
A	82	1.06	0.49	0.05	0.96-1.17	0.620
B	129	1.14	0.47	0.04	1.05-1.22	
AB	13	1.19	0.39	0.11	0.64-1.14	
O	76	1.08	0.48	0.05	0.98-1.19	

P-value derived from Kruskal-Wallis test

Table 8. Comparison of mean gingival index (GI) scores among blood groups

Groups	N	Mean	S.D.	S.E.	95% C.I.	P-Value
A	82	0.91	0.47	0.05	0.81-1.02	0.893
B	129	0.96	0.46	0.04	0.88-1.05	
AB	13	0.88	0.44	0.12	0.64-1.14	
O	76	0.92	0.45	0.05	0.83-1.03	

P-value derived from Kruskal-Wallis test

Table 9. Frequency distribution of missing teeth (MT) scores among blood groups

Groups		MT = 0	MT = 1	MT = 2	MT = 3	MT = 4	Chi-Square	P-Value
A	n	39	14	15	3	11	8.496	0. .745
	%	47.6	17.1	18.3	3.7	13.4		
B	n	55	34	24	3	13		
	%	42.6	26.4	18.6	2.3	10.1		
A	n	5	2	4	0	2		
B	%	38.5	15.4	30.8	0.0	15.4		
O	n	29	25	11	2	9		
	%	38.2	32.9	14.5	2.6	11.8		

The variation in mean age (p = 0.004) was tested among blood groups and a statistical significant difference was found (Table6).The mean PI, GI, PPD, and CAL scores were compared among the blood groups using the non-parametric Kruskal-Wallis test.

It was found that there was no significant difference in mean PI (p = 0.620) and GI scores (p= 0.893) among the blood groups (Table 7, Table 8). Table 9 shows frequency distribution of MT scores among various blood groups. Cross tabulation with chi-square test did not show any significant variation (p=0.745) in proportions of MT scores among blood groups (Table 9). The mean PPD scores showed significant difference (p=0.000) among blood groups (Table10). The blood group A showed a highest mean PPD value of 5.30 ±1.17 and group AB showed the least 3.98 ±0.53. Post hoc test (Dunn-Bonferroni test) was performed to allow pair-wise comparison of mean PPD values among blood groups (Table 11). A statistically significant results were found between the pairs A v/s B (p=0.000), A v/s O (p=0.033), B v/s AB (p=0.000), B v/s O (p=0.044) and AB v/s O(p=0.001)

Table 10. Comparison of mean periodontal pocket depth (PPD) scores among blood groups

Groups	N	Mean	S.D.	S.E.	95% C.I.	P-Value
A	82	5.30	1.17	0.12	5.05-5.57	0.000*
B	129	5.21	1.04	0.09	5.02-5.38	
AB	13	3.98	0.53	0.14	3.68-4.29	
O	76	5.00	1.13	0.13	4.77-5.28	

P-value derived from Kruskal-Wallis test ;* significant at p < 0.005

Table 11. Pairwise comparison of mean periodontal pocket depth (PPD) scores among blood groups

Pair	Statistic	P-Value
A v/s B	4.146	0.734
A v/s AB	116.736	0.000*
A v/s O	29.340	0.033†
B v/s AB	112.589	0.000*
B v/s O	25.194	0.044†
AB v/s O	-87.396	0.001*

Post hoc comparisons done by Dunn-Bonferroni test ;* significant at p < 0.005 : †significant at p < 0.05

Table 12. Comparison of mean clinical attachment loss (CAL) scores among blood groups

Groups	N	Mean	S.D.	S.E.	95% C.I.	P-Value
A	82	3.93	2.21	0.24	3.49-4.44	0.012†
B	129	3.93	2.11	0.18	3.56-4.29	
AB	13	2.25	0.71	0.19	1.83-2.65	
O	76	3.36	1.94	0.22	2.95-3.80	

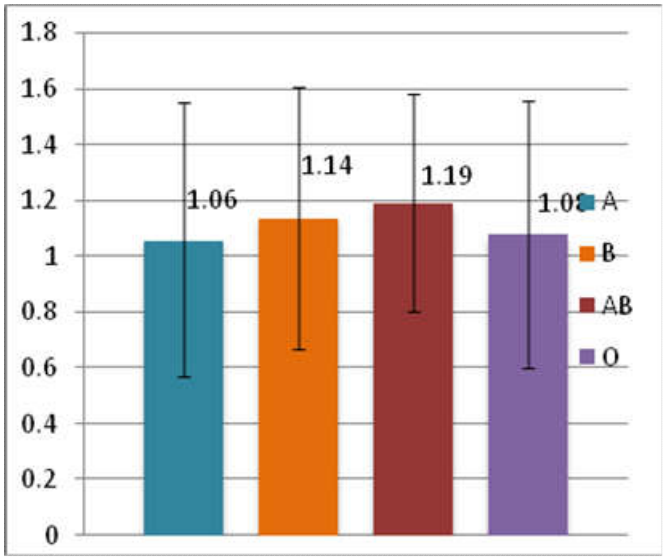
P-value derived from Kruskal-Wallis test;†significant at p < 0.005

Table 13. Pairwise comparison of clinical attachment loss (CAL) score among blood groups

Pair	Statistic	P-Value
A v/s B	-3.324	0.785
A v/s AB	64.912	0.012†
A v/s O	23.493	0.088
B v/s AB	68.236	0.007†
B v/s O	26.817	0.032†
AB v/s O	-41.419	0.110

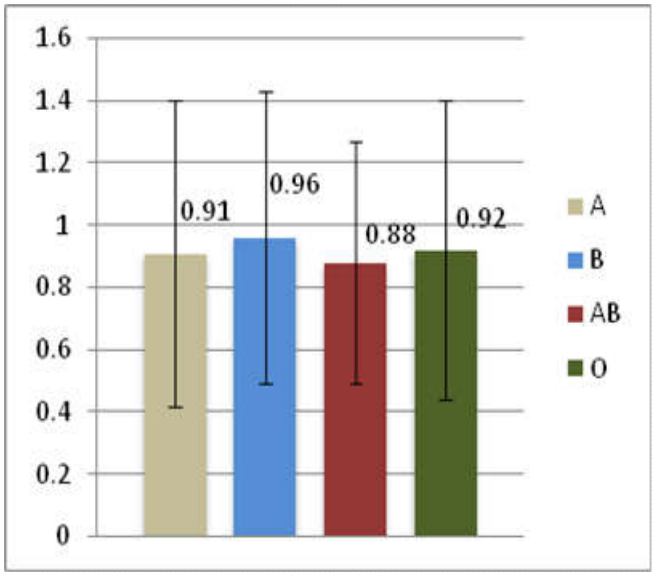
Post hoc comparisons done by Dunn-Bonferroni test ;†significant at p < 0.0

The mean CAL scores were also compared among various blood groups (Table 12). The results showed a statistically significant difference (p=0.012) among blood groups. The blood groups A and B showed a highest mean CAL value of 3.93 ±2.21 and group AB showed the least 2.25 ±0.71. Post hoc test (Table 13) showed statistically significant difference between the pairs A v/s B (p=0.012), B v/s AB (p=0.007), and B v/s O (p=0.032).



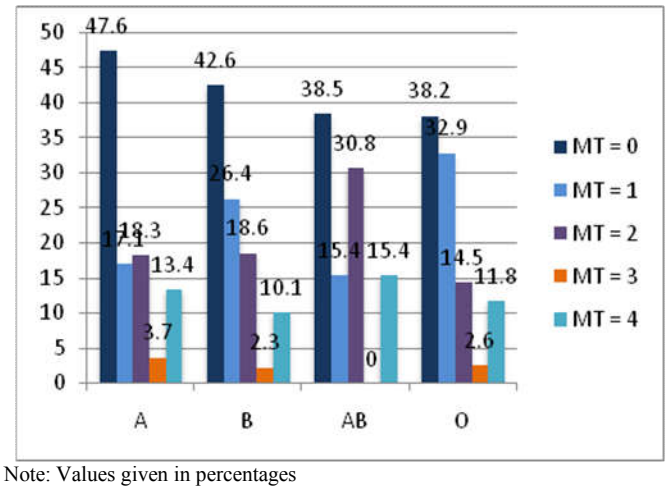
Note: Error bars represents standard deviation

Figure 1. Comparison of mean plaque index (PI) scores among blood groups



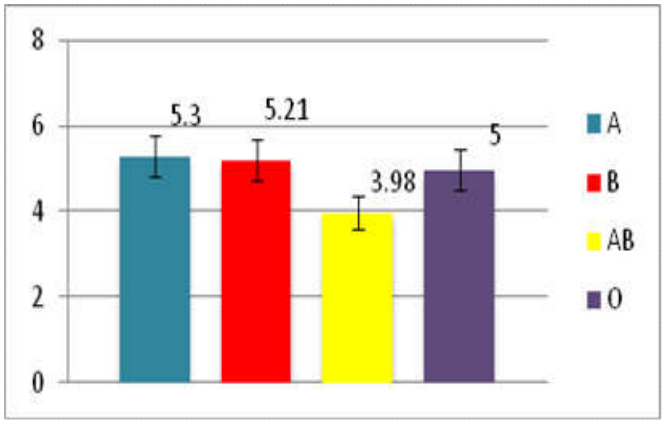
Note: Error bars represents standard deviation

Figure 2: Comparison of mean gingival index (GI) scores among blood groups



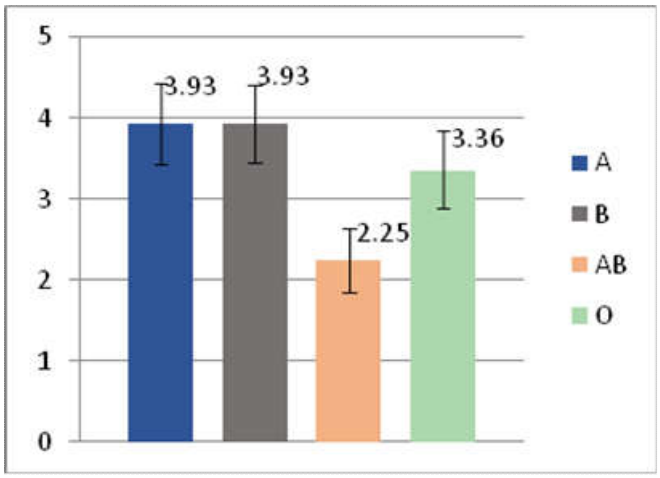
Note: Values given in percentages

Figure 3. Frequency distribution of missing teeth (MT) scores among blood groups



Note: Error bars represents standard deviation

Figure 4. Comparison of mean periodontal pocket depth (PPD) scores among blood groups



Note: Error bars represents standard deviation

Figure 5. Comparison of mean clinical attachment loss (CAL) scores among blood groups

DISCUSSION

The present cross sectional study comprised of 300 subjects, within the age group of 25-55 years of either sex, who reported to the Outpatient. Department (OPD), Department of Periodontics, DY Patil School of Dentistry, Navi Mumbai and who met the inclusion criteria. Study group included 300 chronic periodontitis subjects. Among chronic periodontitis subjects, equal number (n-100) of subjects were included in the three subgroups (mild, moderate, severe) according to severity of periodontitis. The mean age of the mean age of subjects in the mild, moderate and severe periodontitis group was 37.44 ±6.91 years (Table 1). On comparison, there was a significant difference in the mean age of subjects in the four groups. Mean age was higher in severe periodontitis group. We observed that there was a significant positive correlation between age and periodontal parameters like PPD, CAL and number of missing teeth ($p \leq 0.001$) (Table 2). This could be explained on the basis that the clinical appearance in chronic periodontitis is generally considered as a function of time. This finding is in agreement with the findings of Ghamdi (2009), where the CAL, proportion of sites with CAL ≥ 3mm and number of missing teeth had significantly strong positive association with age. Among the chronic periodontitis subjects, 52.7% were male and 47.3% were female. The Severity of periodontitis (CAL) was more in males (4.05±2.16) as compared to that in females (3.60±2.10).

The difference was not statistically significant (p> 0.05) (Table 3, Graph 2). Similarresults were reported by Ghamdi (2009), Sex differences in the development and progression of periodontitis can be attributed to underlying variations in genetic or environmental mechanisms. The distribution of blood group in the study group was 'A' (28%), 'B' (30.5%), 'AB' (10%) and 'O' (31.5%). (Table 5, Graph 3) Similar distribution was reported in a previous study conducted in Belgaum, Karnataka, where blood group 'O' (32.8%) was the highest, followed by group 'A' (30%), 'B' (30%) and 'AB' (8%). In our study, the distribution of blood group was 'A' (26%), 'B' (32%), 'AB' (14%) and 'O' (28%) in healthy subjects (Table 5, Graph 4).

A high percentage of blood group 'B'(32%) was observed in the healthy group. This finding is in agreement with the finding of Pradhan *et al*. (1971), (Ghamdi, 2009) where the healthy group a showed higher percentage of blood groups 'A' and 'B'. On the contrary, this is in variance with findings of Demir *et al* (2007), (Ghamdi, 2009) Koregol *et al* (2010) who reported high percentage of blood group 'A' And Pai *et al*. (2012) reported high percentage of blood group 'O' in the healthy group. In the mild (36%) and moderate periodontitis (38%) group a relatively high percentage of blood group 'B' was observed (Table 6, Graph5). This finding is in accordance with the finding of Ghamdi (2009),where moderate and severe forms (CAL≥3mm) showed higher percentage of blood group 'B'. In the severe periodontitis group a high percentage of blood group 'O' (46%) was observed (Table 6, Graph 5). Similar findings were reported by Pradhan *et al* (1971),Demir *et al*(2007), (Ghamdi, 2009) Koregol *et al*. (2010) (Page *et al*., 1997) where severe periodontitis showed higher percentage of blood group 'O'. However, this is in variance with findings of Ghamdi (2009) (Von Decastello *et al*., 1902) and Pai *et al* (2012) where severe from showed a higher percentage of blood group ' B'.

Among chronic periodontitis subjects, periodontal parameters like PI, GI, PPD, CAL and number of missing teeth were significantly higher in severe periodontitis (p<0.001) (Table7, Graph 6). There was a significant difference in the mean CAL among the blood groups and HighermeanCAL (4.37±2.03) was observed in the blood group 'O'. (p<0.05) (Table 8,Graph7) The severe periodontitis group showed a significant association with blood group 'O'. Similarly, the mild and moderate periodontitis group showed a significant association with blood group 'B' (p<0.05) (Table 6, Graph 5). Thus, a significant association between blood groups'B' and 'O' and severity of chronic periodontitis was observed in our study. (p =0.024) (Table 6, Graph 5). Similar results were reported in the previous study conducted by Ghamdi (2009) (Von Decastello *et al*., 1902). The relative liability of some blood group phenotypes to certain oral diseases has been investigated earlier. It is suggested that a higher percentage of blood group 'O' and low percentage of blood group 'A' is seen in caries immune group. In addition, denture wearers of blood group 'O' were also found to be more susceptible to denture stomatitis. Maxillofacial deformities were greater with blood group ' B' comparison to other blood groups, suggestive of ABO blood groups as one of the etiologic factor for these deformities (Moulds, 1996). Similarly, studies conducted by Pradhan *et al* (1971) (Ghamdi, 2009), Demir *et al*. (2007), Ghamdi (2009), Koregol *et al*. (2010) (Page, 1997) and Pai *et al* (2012) (Pai, 2012) have reported an association between blood groups and periodontal disease.

On the contrary Carmichael (1965) and Kaslick (1980) reported that there was no association between blood groups and periodontal disease. The blood group 'B' and 'O' have been associated with periodontitis in majority of the studies reporting an association between blood groups and periodontal disease. However, variation in the distribution of blood groups was observed in few studies. This could be attributed to the diverse population groups, variations in sample size and different age groups (13-30 year). The explanation for the association between blood group and severity of periodontitis could be based on the blood group antigens (A,B,H) in oral tissues. Blood group antigens (A,B, H) are carbohydrate present in the tissues and can act as the receptor for various infectious agents including bacteria and virus (Dabelsteen *et al*., 2002). Recently, they were found in the oral tissues such as taste buds, tongue papillae and gingival junctional epithelium. Blood group antigens are recognized as the self antigen by the host and antibodies are not produced against them, thus making the receptor sites of blood group antigens available for bacterial adhesions. According to Hay *et al* (1975) high molecular weight mucins, which may possess A,B,H antigens are present in dental plaque which may bind to the bacteria and enable them to accumulate in large numbers on the teeth (Hay *et al*., 1996). Therefore, it can be hypothesized that A,B, H antigens present in dental plaque may act as receptor for the microbiota which are associated with chronic periodontitis. It is also a well established fact that individuals ofblood group O are more susceptible to peptic ulcers. The blood group antigen (H)is an important receptor for 61-KD bacterial adhesions protein, explaining the increased susceptibility of blood group O to peptic Ulcers (Alkout *et al*., 1997). H antigen is the precursor for the formation of A and B antigens. In individuals belonging to A and B antigens, the precursor H antigen is covered to A and B antigens respectively whereas in blood group O individuals it remains in its original form. Hence individuals with blood group O have the highest amount of H antigen. Thus, the gingival tissues of individuals with blood group O has highest H antigen which may act as the receptor for gram negative species. Therefore, in the present study we found a higher percentage of the individual with blood group O in severe periodontitis. The study showed that subjects with blood group 'B' were highest in the mild and moderate periodontitis and blood group 'O' were highest in the severe periodontitis group. Hence, in our study we found an association between blood group 'B' and 'O' with the severity of chronic periodontitis.

Conclusion

Among chronic periodontitis Subjects, equal number (n-100) of subjects were included in the three subgroups (mild, moderate, severe) according to severity of periodontitis. On oral examination plaque index, gingival index, pocket probing depth, clinical attachment loss and the number of missing teeth were recorded. The blood group investigation was carried out by slide agglutination method. The distribution of blood groups in the study group was 'A' (28%), 'B'(30.5%), 'AB' (10%) and 'O' (31.5%). A high percentage of blood group'B' (32%) was observed in the healthy group. In mild (36%) and moderate periodontitis (38%) group a relatively high percentage of blood group 'B' was observed. In severe periodontitis group a high percentage of bloodgroup 'O' (46%) was observed. Periodontal parameters like PI, GI, PPD, CAL and number of missing teeth was significantly higher in severe periodontitis (p<0.001).

The mild and moderate periodontitis group showed a significant association with blood group 'B'. The severe Periodontitis group showed a significant association with blood group 'O' (p=0.024). Within the limitations of this study, the following conclusions were drawn:

- The distribution of blood group in the study group was 'A' (28%), 'B' (3005%), 'AB' (10%) and 'O' (31.5%).
- There was a significant association of blood group 'B' with mild and moderate Periodontitis
- (p =0.024).
- There was a significant association of blood group 'O' with severe periodontitis (p =0.024).
- Hence, in our study we found an association of blood groups 'B'and 'O' with the Severity of chronic periodontitis.

The blood group 'O' have been associated with severity of periodontitis in most of the studies, reporting an association between blood groups and periodontal disease. The severity of periodontitis is the result of multiple risk factors and the genetic influence is a small aspect as the etiology of this disease. The specific role of blood group 'B' and 'O' in the severity of Chronic periodontitis needed to be further evaluated. The multicenteredwell controlled studies with larger sample size should be aimed in future to further explore the role of the blood groups in severity of chronic periodontitis.

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