

Short Communication

RELATIONSHIP BETWEEN PERIODONTAL DISEASE AND ABO BLOOD GROUP PHENOTYPES-A CROSS SECTIONAL RETROSPECTIVE STUDY

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Received: 22 Jul 2015 Revised and Accepted: 03 Oct 2015

ABSTRACT

Objective: Numerous epidemiological studies have been carried out to assess the association of ABO blood typing and systemic diseases. However, the research is still at the infancy stage with regards to the dental field. Periodontitis, being one of the most prevalent diseases in the oral cavity can be supposed to be influenced by the blood grouping pattern among patients. The present cross-sectional study was carried out to assess the relationship between periodontal disease status and the ABO blood group.

Methods: In a retrospective study of 2014, patients who reported to Saveetha Dental College and Hospital and diagnosed with chronic periodontitis, both localized and generalized forms were included. Demographic data, diagnostic and the ABO blood grouping information were procured from the case records of 410 subjects and then analysed.

Results: Among the 410 individuals, 245 were diagnosed with localized chronic periodontitis whereas 165 subjects had suffered from generalized chronic periodontitis. A high fraction of the localized periodontitis population (20.97%) was of the blood group 'B.' Similarly (12.92%) of the generalized periodontitis cases belonged to either 'B' or 'O' blood groups. The least affected blood group was 'AB.'

Conclusion: This cross-sectional study shows a definite relation between blood typing and periodontal disease. Further studies are required in order to validate the usage of blood groups as risk predictors for periodontitis.

Keywords: ABO antigen, ABO blood group, Periodontal disease, Periodontitis.

Periodontitis is a chronic inflammatory disease that results in the loss of connective tissue and alveolar bone support of the teeth. Periodontal diseases are highly prevalent [1, 2], with chronic periodontitis (CP) being the most common form of disease showing prevalence rates of >90% for adults above 60 y. Furthermore, it is the major cause of tooth loss in adults above 40 y, and according to WHO; the more severe forms of the disease affect up to 20% of the human population worldwide [3].

All human beings share the same blood system, although they differ in the frequencies of specific types. It was reported that blood group 'A' has a wider distribution among Eskimos, 'B' in Chinese and Indians, the group O in Americans, Canadian Indians, Czechoslovakians and Kenyans.

The history of investigations on the relation between blood typing and dental diseases dates back to 1930. Landsteiner first described the existence of serologic differences between individuals, allowing him to classify people into one of four groups depending on whether their red cells contained agglutinin 'A,' agglutinin 'B,' neither A nor B (i.e., O) or both A and B (AB) [4]. This discovery led to a series of serologic, genetic and immunochemical studies that are still being researched upon till date.

In India and Western countries, many workers have tried to find out the relationship between ABO blood group and various systemic diseases, and the results showed that some diseases like dental caries [5] salivary gland tumours [6] oral cancer [7] had significant association. The susceptibility of individuals to certain systemic diseases had been assessed using their blood group phenotype in varied studies. As per a study among Bangladeshi people, blood group phenotype O was associated with a substantially increased risk for coronary artery disease (CAD)[8]. Diabetes mellitus might be highly prevalent in subjects of blood groups A and O [9].

Although several studies have been carried out to investigate the relationship between ABO blood groups and the incidence of certain diseases in general, the dental research has still not focused on the correlation between the blood typing and periodontitis. It is well known that periodontal diseases have the high incidence in the

population. Although bacterial plaque is considered the primary extrinsic etiologic agent in periodontal diseases, our purpose in this study is to assess whether there is a relationship between ABO blood groups and periodontal diseases by simple research methodology and evidence based analysis.

It is a retrospective study where the information was collected from the case records of patients who reported to Saveetha Dental College and Hospital from 14.3.2014 to 25-6-2014. This study included 410 subjects, of both the sexes, aged above 20 y. This study included patients already diagnosed with chronic periodontitis, who had at least 20 teeth excluding the third molars at the time of diagnosis with their blood grouping record. Since some of the case records did not have the information about blood group, the patients were contacted telephonically and the blood type was recorded. Those who were unaware of their blood group and those who were not willing to share the information were excluded from the study.

Demographic data such as name, age, sex and the periodontal diagnosis (localized/generalized chronic periodontitis) based on clinical parameters were assessed and the percentage of subjects with different ABO blood groups was segregated according to the two forms of the disease.

The male: female ratio was 256:154. Among the males, 210 subjects had localized periodontitis while 46 cases suffered from the generalized form. Among the females, 124 subjects were diagnosed with localized periodontitis and 30 cases with the generalized form.

The prevalence of subjects with blood groups A, B, AB and O were distributed as 24.63% (101), 33.9% (139), 8.53% (35) and 32.92% (135) respectively among the periodontitis patients [table 1]. A relatively high percentage of individuals with blood group B (20.97%), blood group O(20%) and a smaller percentage of blood group AB (3.41%) was observed in the localized periodontitis group [fig. 1]. Similarly, a high percentage distribution of blood groups B and O (12.92%) and a smaller percentage of blood group AB (5.12%) was observed in the generalized periodontitis group [fig. 2]. This data depicts that blood groups B and O leaned towards the disease status whereas blood group AB leaned towards health.

Table 1: Percentage distribution of ABO blood group respectively

Periodontitis	Group A (n)	Group B(n)	Group AB(n)	Group O(n)
Localized	63	86	14	82
Generalized	38	53	21	53
Total	101	139	35	135

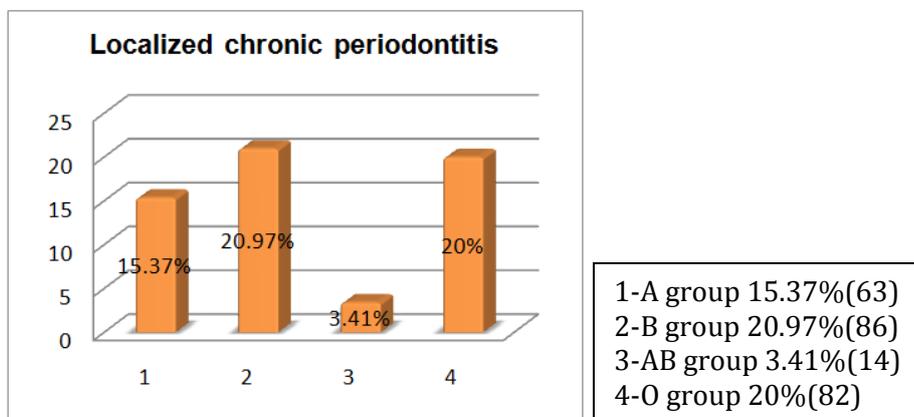


Fig. 1: Proportional distribution of ABO blood groups among localized periodontitis patients

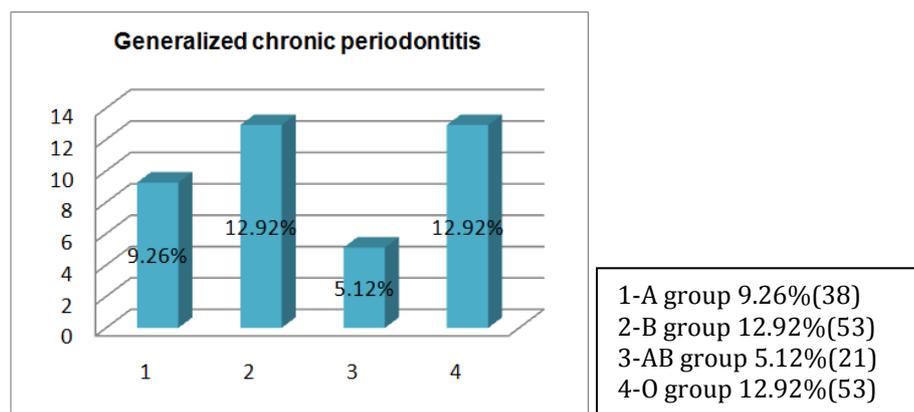


Fig. 2: Proportional distribution of ABO blood groups among generalized chronic periodontitis patients

The presence of microorganisms is a fundamental factor in inflammatory periodontal disease, but the development of the disease is also associated with certain environmental and genetic factors. Studies on ABO blood groups and the variation in the rate of periodontitis affected individuals were carried out by various researchers. They have deduced that there were variations based on the region and the blood groups. Demir *et al.* found that different ABO blood groups may show significant differences in the rates of colonization of a number of periodontal pathogens that are the main etiologic agents of periodontal diseases [10].

The observed values for blood groups A, B, AB and O were 24.63% (101), 33.9% (139), 8.53% (35) and 32.92% (135) respectively. This is in line with a recent study carried out by Pai *et al.* in Karnataka, South India. The obtained results for the blood groups A, B, AB and O (24.27%), 228 (30.4%), 45 (6%), and 295 (39.3%) [11]. Through our study, it is noted that a comparatively high percentage of individuals with blood group B (20.97%), and a smaller percentage of blood group AB (3.41%) patients were observed in the localized periodontitis group. Similarly, a high percentage distribution of blood group B and O (12.92%) and a smaller percentage of blood group AB (5.12%) in the generalized periodontitis group was observed.

Our study is in accordance with the research conducted by Koregol *et al.*, which concluded that the blood group O showed a higher

percentage in the periodontitis group, and that AB phenotype showed the least percentage in periodontal diseases [12]. This association can be due to various blood groups antigens acting as receptors for infectious agents associated with periodontal disease. This broad correlation between periodontal disease and ABO blood group also points toward susceptibility of the subjects with certain blood groups to periodontal disease.

In our study, the results obtained showed a higher fraction of blood groups' B (33.9%) and O (32.92%) among periodontitis patients. The data obtained also follows the general distribution of blood groups among South Indians, i.e., 20.68%, 33.07%, 38.99%, and 6.25% for blood groups A, B, O and AB respectively [13], which is of the same geographic location as our study. Hence the results cannot be definitive as we did not establish a control group which is one of the limitations in this study. Moreover, smokers, diabetic patients, tobacco and drug users, alcoholics were not excluded and these confounding factors generally increase the risk for periodontal disease and could have influenced the results obtained from this study.

The genetic factors may alter the oral ecology and have a bearing on the etiopathogenesis of periodontal diseases. Genetic differences in immune cell development and antigen presentation may contribute to the susceptibility to certain infectious diseases. Even though our study having a broader focus showed two blood groups (B, O) having

an association with periodontal disease, future studies with an emphasis on the correlation between the blood group antigens and development of periodontitis are necessary in order to gauge the susceptibility pattern of different individuals. The derived results can be used as a stepping stone in order to focus the research on targeting highly susceptible individuals and developing customised treatment strategies.

CONFLICT OF INTERESTS

Declared None

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