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Correlation between blood group and Dental caries status of college students in Kodagu district

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ABSTRACT

It is well known that dental diseases can vary according to different bacterial etiology, host response, and clinical progression of disease, tooth composition of minerals, saliva, tooth structure, diet, diabetes, smoking and genetic predispositions. Dental caries is common chronic disease in human, which is also commonly known as tooth decay; when, its treatment is ignored, the disease will progress and causes destruction of the tooth.

Objectives of the study:

1. To know the association between dental caries and blood groups among 18-22 year old college students in Kodagu district.

Material and method – 400 students(100 of each blood group) 18-22 year's age group from 5 college in Kodagu District holding a certified copy indicating blood group were randomly selected for the study. After inclusion of study participants , Intraoral examination was carried out by a mouth mirror, a standard WHO probe and normal illumination light .Oral health status were assessed with the help of DMFT index..

Results- Out of 400, 146 males and 254 females, B blood group patients had the highest mean DMFT score (5.41) and AB the lowest mean DMFT score (1.55), among all groups and results was statistically significant. ANOVA showed that there was significant difference in dental caries and gingival scores of different blood groups.

Conclusion- This study results suggested a positive association between blood groups and DMFT score and Gingival score**.**

Keywords: Dental carries, Blood group, DMFT

INTRODUCTION

It is well known that dental diseases can vary according to different bacterial etiology, host response, and clinical progression of disease, tooth composition of minerals, saliva, tooth structure, diet, diabetes, smoking and genetic predispositions. Although there is a difference between gingival disease, and dental caries, but both share the common characteristic of complex host–bacterial interactions [1] .

Dental caries is common chronic disease in human, which is also commonly known as tooth decay; When, its treatment is ignored, the disease will progress and causes destruction of the tooth. According to study report in developed countries the

prevalence of dental caries is decreasing, but in underdeveloped and developing countries, the prevalence is increasing [2] .

Due to the change in lifestyle , that include increasing the sugary food consumption, and soft drinks, and lack of awareness about proper maintenance of oral and dental health showed an increase in prevalence dental caries in the past few decades [3] .

Landsteiner (1900) first described the existence of serologic difference between individuals, and classified people into four groups depending on whether their RBC cell membrane contained agglutinogen "A (group A) ," agglutinogen "B (group B)," neither A nor B (group 0) or both A and B (group AB). ABO blood blood-typing system, play important role in determinant for transfusion reactions and organ transplantation. Unlike the other blood-typing systems, the ABO blood type system has significance beyond transfusion and transplantation, for example, it also determines many of the digestive and immunological characteristics of the body [4] .

The secretion of ABO antigens into saliva probably inhibits the ability of bacteria to attach to the tooth surface; this is because many of these bacteria have surface lectins, which will help those bacteria to attach to body surfaces and are often ABO specific. In other hand non-secretors tend to have lower levels of the immunoglobulin A (IgA) antibodies in their saliva, which may compromise their ability to keep bacterial counts low [5] .

Faser Roberts outline the relationship between ABO blood group and susceptibility to chronic disease as an example of genetic basis for family predisposition. many researchers have tried to find out the relationship between ABO blood group and various systemic diseases. Study showed significant association in some diseases like dental caries, salivary gland tumors, chicken pox, malaria, oral cancer, hematological malignancies, ischemic heart disease, cholera, etc.Studies found the dental caries prevalence was lower in secretors group compare to nonsecretors group. In contrast, Mazumdar et.al. did not find significant association [6] .

Knowledge of the ABO blood groups of patients and their association with the dental diseases is very important, as it can help in the development of early diagnosis and treatment strategies. Limited efforts have been made to evaluate the correlation between ABO blood group and oral disease .Hence the present study was conducted with the aim of determining the association, between ABO blood group and dental status among 18-22 year old college students in Kodagu district .

Materials and methods

The present cross sectional study was conducted to investigate the association, between ABO blood group and oral health status of college students in Kodagu district. Ethical clearance for the present study was obtained from Institutional Ethical Committee of the institutional review board of Coorg institute of dental sciences ,Virajpet. An official Permission was obtained from the college authority by explaining the details & purpose of the study and written informed consent was obtained form the participants.

Inclusion criteria:

- Students in the age group of 18-22 years attending various colleges in Kodagu district
- Students holding a certified copy indicating blood group was included in the study.
- Students willing to participate in the study.

Exclusion criteria:

- Students who are not willing to participate.
- Teeth having restorations due to aesthetic purposes or reasons other than caries like laminates, crowns will not not scored.
- Students absent on the day of examination.

Method of Collection of data : A total of 400 students (100 form each blood group) of 18-22 yrs age group studying in various colleges in Kodagu district was randomly selected for the study. Only students holding a certified copy indicating blood group was selected for the study. Intraoral examination was carried out by a mouth mirror, a standard WHO probe and normal illumination light .Oral health status was assessed with the help of DMFT index .The blood group was determined from the certificate.

Volume 4, Issue 3; May-June 2021; Page No 931-935

Materials : For oral examination a mouth mirror, explorer and natural light as per the guidelines of ADA for type 3 examination was used.

The following instrument were used in this study:

- mouth mirror
- Explorer
- Kidney tray
- Disposable gloves and mouth mask

Statistical analysis : All data were collected patient wise. The data was then arranged systematically and the information collected was transferred to computer for analysis using SPSS. One way ANOVA was used to compare followed by turkey's post hoc test.

Results

The study participants comprised of 400 college students (100 form each blood group, 260 Female and 140 Male) in the age group of 18-22 years. The mean age of the participants was 19.61+1.45. (Table I,Graph 1).

Table 2 depicts the association between blood group and DMFT score. Among the study subjects with blood group B+, mojority of subjects having DMFT score 0 to 14 . Subjects with blood group AB,81 subjects having DMFT score of 0 and 2. On applying chi square test a statistically significant (p = .000 (HS) result was obtained between the blood groups and the dental caries (DMFT score).

B blood group had the highest (5.41) mean DMFT score and AB had the lowest (1.55). Table 3 illustrates that there is highly significant(.000) difference in dental caries of different blood groups. Post hoc Tukey test applied for intergroup comparison of the DMFT scores between the four blood groups .

Discussion

Advances in research it was proved that apart from etiological agents and environmental factors, certain unknown factors also play a role in the development of dental disease so this research was done to find out whether there is a relationship between dental carries, periodontal disease and blood groups [7] .

As blood groups are transferred through gene so there is a chances a hereditary relationship between dental carries and blood groups. The association of blood group and dental caries can be better explained by the fact that certain blood groups have the ability to secrete antibodies into the saliva which can prevent dental carries [8] .

Saliva originates from several specialized glands located under the tongue and along the inside of the mouth. As mucins are composed of glycoproteins, it can be imagined that ABO blood type antigens are copiously produced by the submaxillary-sublingual salivary glands and extensively distributed in human saliva. The blood antigens are secreted into the saliva and have been proposed to be growth medium for the bacteria to grow and it helps to growth of bacteria causing dental caries [9] .

In the present study 400 subjects participated, which is similar to the study conducted by Vivek et al and contrary to the study done by Singla et al [7,9] .

The present study (Table 2) shows that all the study subjects with B-blood groups had highest dental caries and Minimum number of dental caries was observed in the subjects with the blood group AB. Present study results is similar to the study conducted by Singla et al and Mazumdar et al and Shunmugam Kumar et al , In which the subjects with B blood group had more dental caries [6,7,8,] .

Janghorbani et al found that the mean value for DMFT index was the lowest in B blood group(3.9) and the highest in AB blood group (4.9) which is contradictory ,where in the distribution of participants were not similar with this present study [5] .

The limitation of the study was small sample size and determination of secretor status was not evaluated, Further studies need to be conducted considering secretor status, diet, ethnicity in larger sample. - Study suggested a positive association between blood groups and DMFT score and Gingival score**.**

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Volume 4, Issue 3; May-June 2021; Page No 931-935

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Table 1 - **Distribution of study subjects**

BLOOD GROUP	**NUMBER OF PERTICIPANTS**
A	100
B	100
O	100
AB	100
AGE	
18	75
19	140
20	86
21	92
22	82

Volume 4, Issue 3; May-June 2021; Page No 931-935

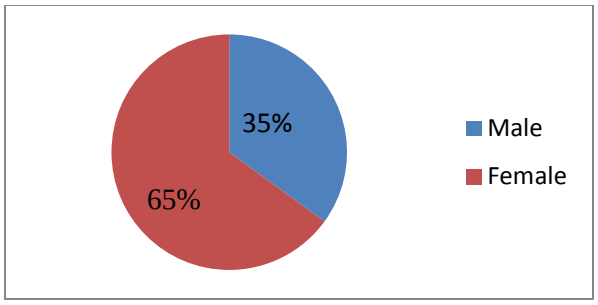

Fig- 1 **Distribution of study subject according to gender distribution**

Table 2 Association between blood group and DMFT score

BLOOD GROUP	DMFT														X^2	p value
	0	1	2	3	4	5	6	7	8	9	10	11	13	14		
A	11	5	13	17	13	19	8	6	5	0	2	0	1	0		
AB	22	31	28	11	5	3	0	0	0	0	0	0	0	0		
B	10	4	5	8	12	8	15	15	4	10	4	4	0	1		.00
O	22	6	20	21	13	5	4	5	1	2	1	0	0	0		
Total	65	46	66	57	43	35	27	26	10	12	7	4	1	1	187.428	

Table- 3: Comparison of Mean DMFT Score between different blood groups

VARIABLE	BLOOD GROUP	MEAN	STANDARD DEVIATION	F	SIGNIFICANCE
DMFT	A	3.92	2.51	54.580	.000 (HS)
	AB	1.55	1.25		
	B	5.41	3.14		
	O	2.81	2.32		

Volume 4, Issue 3; May-June 2021; Page No 931-935