Original Article

Prevalence Of Salivary Secretor Status Of ABO Blood Group Antigens In Potentially Malignant Disorders Of The Oral Cavity

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Abstract

INTRODUCTION: In recent times, the salivary secretor status of an individual is increasingly being viewed as a potential contributing factor in the etiopathogenesis of oral precancerous lesions and subsequently cancer. Studies have shown secretor status of an individual is related to the pathogenesis of the disease and have also revealed the association between blood groups and specific diseases. This study aims to assess any association of ABO blood grouping with oral potentially malignant disorders (OPMDs) and to examine whether there is any difference in the saliva secretor status in the patients with OPMDs and healthy controls.

MATERIALS AND METHODS: The study included 110 subjects with 55 patients assigned to two groups (a) Patients with potentially malignant disorders (b) healthy control group. Blood samples were collected from all the participants and ABO blood grouping was done. Following this, 1 ml of unstimulated saliva was collected in a sterile test tube and the Wiener agglutination test was performed to analyze the secretor status in both the groups. Chi-square test and Fisher's exact test was used to assess the relationship between ABO blood group and OPMDs. Chi-square test was performed to assess the relationship between secretor status and OPMDs. The probability value .05 was considered as the significant level.

RESULTS: The results of this study revealed that there was neither a statistically significant difference between cases and controls

with regard to their salivary secretor status nor between the secretor status of the various blood groups.
CONCLUSION: The role of salivary secretor status of ABO blood groups in oral potentially malignant disorders and the importance attached to it as being a contributing factor to oral carcinoma needs to be reconsidered.

KEYWORDS: Blood grouping, O ral cancer, Oral Pre Malignant Lesions, Oral Pre Malignant Conditions, Saliva, Secretor status

INTRODUCTION

Head and neck squamous cell carcinoma (HNSCC) ranks 6th among the most common cancers in the world and comprises 2.5% of all new cases of cancer and 1.9% of all cancer related deaths annually (1). The etiology of oral cancer is multifactorial and is associated with risk factors like chronic use of tobacco, spicy food, alcohol and genetic factors. Most cases of oral squamous cell carcinomas arise from asymptomatic clinical lesions referred to as oral potentially malignant disorders (OPMDs)(2).

Oral potentially malignant disorders (OPMDs) are conditions that precede the appearance of invasive cancers of the oral cavity. The term encompasses both precancerous lesions (A morphologically altered tissue in which oral cancer is more likely to occur than in its apparently normal counterpart) and precancerous conditions (A generalized state associated with a significantly increased risk of cancer) that were described in the previous WHO definitions (3). Hence, accurate diagnosis and effective management may contribute to prevention of malignant transformation of these lesions, thus improving the chances of survival of these patients(4).

Blood groups A, B and O were discovered by Karl Landsteiner in 1900 and the 4th group AB was later described by his pupils(5). Alexander in 1921 was first to describe the possibility of association between ABO blood groups and malignancy. It has been observed in many studies that certain blood groups are more likely to develop premalignancies that can further progress into malignancies(5). ABO secretors are those who secrete blood group antigens into their body fluids such as saliva, sweat, tears, semen, and serum, and those who do not secrete their blood group antigens in their body fluids are referred to as non-secretors(6). Existing literature has very few studies that assess the association of ABO secretor statuses of individuals with the development of oral potentially malignant disease. This warrants the need for further research into this area as the findings may indicate the use of ABO secretor status as a possible tumour marker. This research is an attempt to find the prevalence of ABO secretor status among individuals with potentially malignant disorders of the oral cavity.

AIM

To evaluate the association between oral potentially malignant disorders and salivary secretor status of ABO blood group antigens

OBJECTIVES

- To estimate the prevalence of salivary secretor status of ABO blood group antigens in patients with oral potentially malignant disorders like leukoplakia, oral lichen planus (OLP) and oral submucous fibrosis (OSMF)
- To determine the association between salivary secretor status and oral potentially malignant disorders, as compared to normal controls

MATERIALS AND METHODS

The study was conducted among the patients attending the dental OP of a teaching hospital from March to August 2019. Ethical clearance was obtained prior to the commencement of the study from the Institutional review board. 110 consecutive patients who satisfied the inclusion criteria were recruited into the study after obtaining a written informed consent. The study sample consisted two groups with 55 patients in each of the two groups (a) Patients with potentially

malignant disorders, including cases of OSMF, Oral Leukoplakia and Oral Lichen Planus and (b) healthy control group comprising of 55 age and sex matched healthy controls with no history of tobacco use. The history of tobacco use was elicited and a thorough intraoral examination was conducted to screen for the presence of any oral potentially malignant disorders.

A. **Inclusion criteria:** Patients with OPMDs and clinically confirmed cases of oral submucous fibrosis (OSF), oral lichen planus (OLP) and leukoplakia. The control group consists of age and sex matched healthy volunteers with no history of tobacco use

B. Exclusion criteria: Patients diagnosed with histologically confirmed oral cancer and those undergoing treatment for the same

Blood samples were collected from all the participants under strict aseptic conditions by a phlebotomist by performing capillary puncture using a lancet and ABO blood groups were was determined using a conventional hemagglutination test with monoclonal antisera Anti-A (blue), anti-B (yellow), and anti-D (colourless) reagents.

Subsequently, 1 ml of unstimulated saliva was collected in sterile test tubes for determination of secretor status using Weiner agglutination test. The patient was instructed to accumulate saliva in the floor of the mouth and then spit it out into the collection test tube every 60 seconds. This saliva was then transferred into sterile test tubes and sealed with a cotton plug. These test tubes were then placed in a boiling water bath for 10 minutes to neutralize the salivary enzymes. The samples were then centrifuged at 1700 rpm and the supernatant fluid was separated. The secretor status of the individual was then determined. The test serum and saliva were diluted in a salted physiological solution at 1:10 dilution. The following antiserum was then placed into test tubes marked I to VI:
I. 1 drop of saliva + 1 drop of anti-B serum

II. 1 drop of saliva + 1 drop of anti-A serum

III. 1 drop of physiological solution + 1 drop of anti-B serum

IV. 1 drop of physiological solution + 1 drop of anti-A serum

V. 1 drop of saliva + 1 drop of anti-H serum

VI. 1 drop of physiological solution + 1 drop of anti H serum

The tubes were then left for 10 or more minutes at room temperature and 1 drop of 2–3% of suspension A erythrocytes was added into sterile tube II and IV, and 1 drop of suspension B erythrocytes into tube I and III, and 1 drop of suspension O erythrocytes into tube V and VI. All the test tubes agitated and left at room temperature.
After one hour the results were available for reading. Test-tubes III, IV and VI were controls and agglutination occurred in them. Agglutination in tube I is due to the presence of substance A in saliva which is indicative of secretor A, while the agglutination in test tube II is a proof of secretor B. The absence of agglutination in tubes I, II and V indicated an AB secretor. This reaction occurs as a result of the presence of both antigens in the saliva of an AB secretor which would interfere with agglutination in tubes I, II and V due to the utilization of the antiserum before the addition of erythrocytes. The absence of agglutination in tube V is indicative of secretor O, while agglutination in all the test tubes is suggestive of the person being a non secretor. Non secretors do not have any antigens in their saliva and thus results in agglutination in all test tubes.

SECRETOR STATUS	**TEST TUBE I**	**TEST TUBE II**	**TEST TUBE III**	**TEST TUBE IV**	**TEST TUBE V**	**TEST TUBE VI**

Secretor A	✓	×	✓	✓	✓	✓
Secretor B	×	✓	✓	✓	✓	✓
Secretor AB	×	×	✓	✓	✓	✓
Secretor O	✓	✓	✓	✓	×	✓
Non secretor	✓	✓	✓	✓	✓	✓
(✓) marks represent presence of agglutination **(×)** marks represent the absence of agglutination						

STATISTICAL ANALYSIS

The collected data were analyzed with IBM.SPSS statistics software 23.0 Version. To describe the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the mean & standard deviation were used for continuous variables. To find the significance in categorical data, Chi-Square test was used and similarly if the expected cell frequency is less than 5 in 2×2 tables then the Fisher's Exact was used. In all the above statistical tools the probability value .05 was considered as significant level.

RESULTS

PATIENT DEMOGRAPHICS

The study had a total of 110 subjects which included 55 cases and 55 age and sex matched healthy controls.

1. AGE DISTRIBUTION (Table I) (Figure 1)

There were 29 subjects in the age group 21-30 years (10 cases and 19 controls), 29 subjects in 31-40 years (19 cases and 10 controls), 21 subjects in 41-50 years age group (11 cases and 10 controls), 15 subjects in 51-60 years (7 cases and 8 controls) and 16 subjects were above 60 years (8 cases and 8 controls). The mean age in case group was 42.5±13.3 years. In the control group, mean age of 41.2±14.7 years. There was no statistically significant difference in age groups between cases and controls (p value: 0.223).

Figure 1: AGE DISTRIBUTION

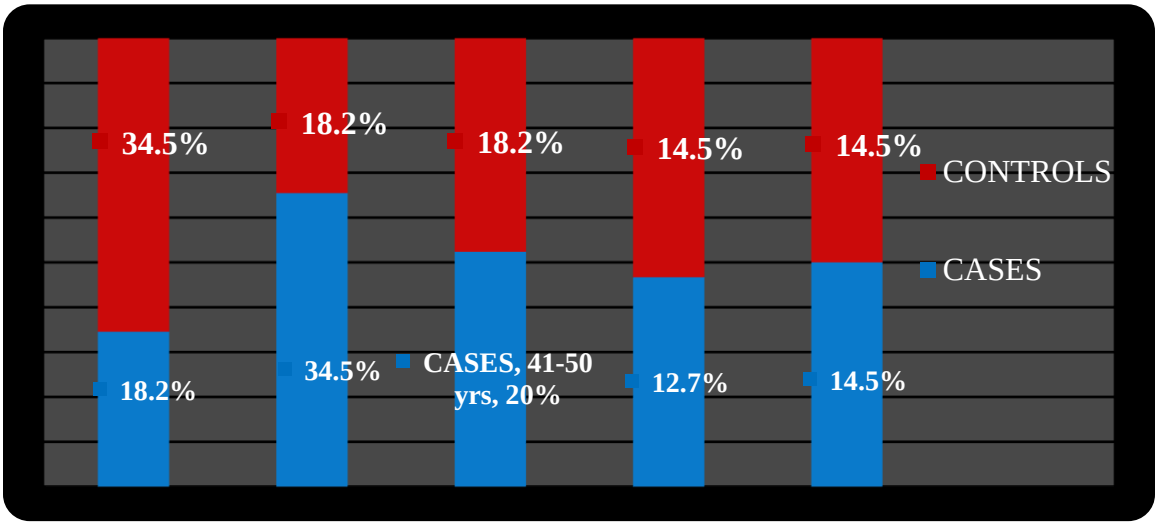

TABLE I: Age distribution between cases and controls

		Groups		Total
		Cases	Controls	
AGE	21 - 30 yrs	10	19	29
	31 - 40 yrs	19	10	29
	41 - 50 yrs	11	10	21
	51 - 60 yrs	7	8	15
	Above 60 yrs	8	8	16
Total		55	55	110

Chi Square Test			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5.700[a]	4	.223
Likelihood Ratio	5.794	4	.215
Linear-by-Linear Association	.303	1	.582
N of Valid Cases	110		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.50.			

Groups		N	Mean	Std. Deviation	Std. Error Mean
AGE	Cases	55	42.527	13.3345	1.7980
	Controls	55	41.255	14.7852	1.9936

2. SEX DISTRIBUTION (Table II) (Figure 2)

The two groups consisted of 12 (21.8%) females and 43(78.2%) males each. There was no statistically significant difference between the two groups with regard to gender (p value:1.000).

Figure 2: GENDER DISTRIBUTION (CASES & CONTROLS)

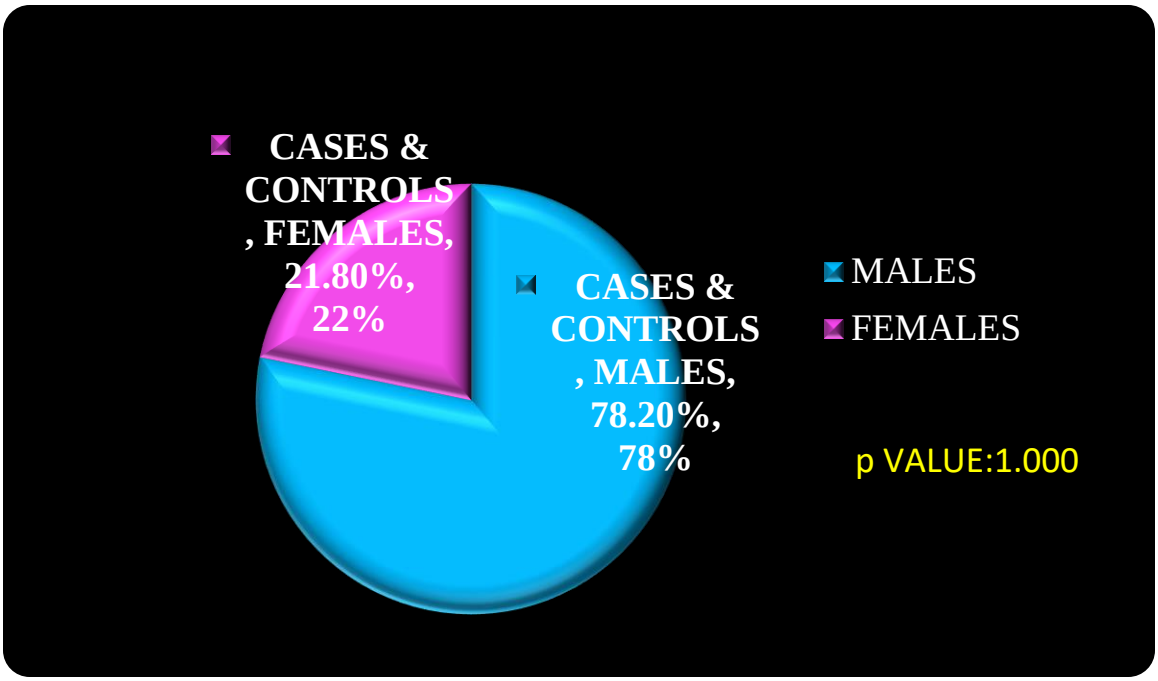

TABLE II : Gender distribution between cases and controls

			Groups		Total
			Cases	Controls	
SEX	F	Count	12	12	24
		%	21.8%	21.8%	21.8%
	M	Count	43	43	86
		%	78.2%	78.2%	78.2%
Total		Count	55	55	110
		%	100.0%	100.0%	100.0%

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.000[a]	1	1.000		
Continuity Correction[b]	0.000	1	1.000		
Likelihood Ratio	0.000	1	1.000		
Fisher's Exact Test				1.000	.591
N of Valid Cases	110				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.00.					

b. Computed only for a 2x2 table

3. SECRETORS AND NON-SECRETORS (Table III) (Figure 3)

In OPMD group, 34 subjects (61.8%) were secretors and 21 subjects (38.2%) were non secretors. In the control group, 42 subjects (76.3%) were secretors and 13 subjects (23.7%) were non secretors. There was no statistically significant difference between cases and controls with regard to their salivary secretor status (p value: 0.099).

Figure 3 A: SECRETOR STATUS DISTRIBUTION (CASE GROUP)

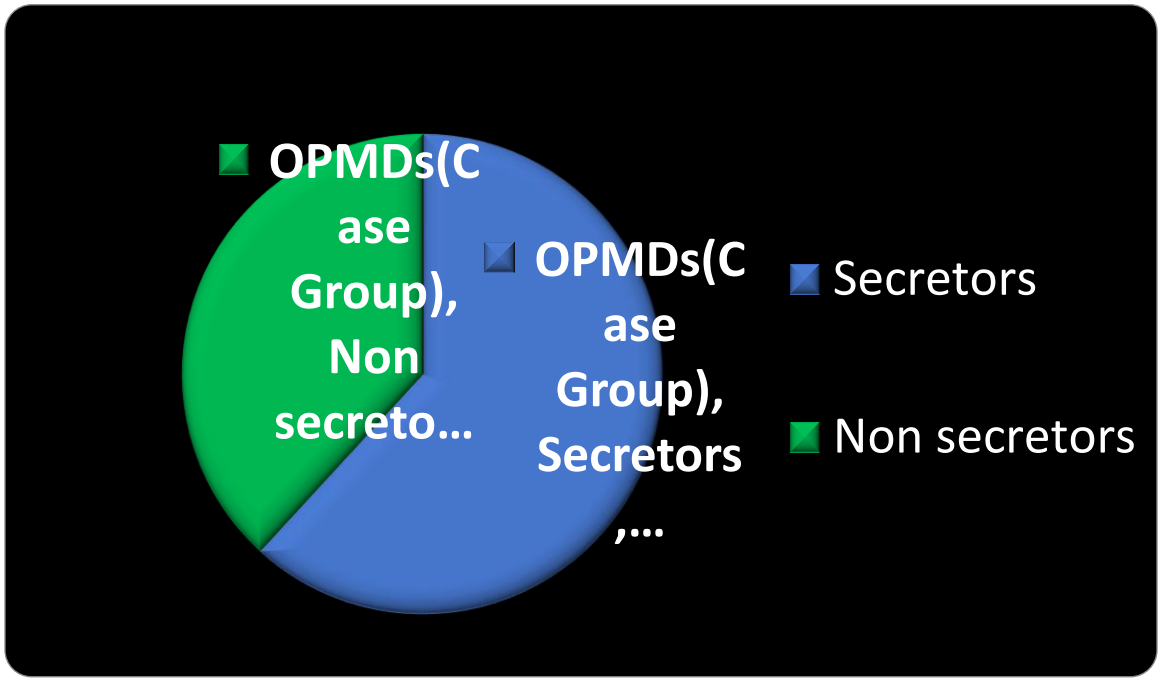

Figure 3 B: SECRETOR STATUS DISTRIBUTION (CONTROL GROUP)

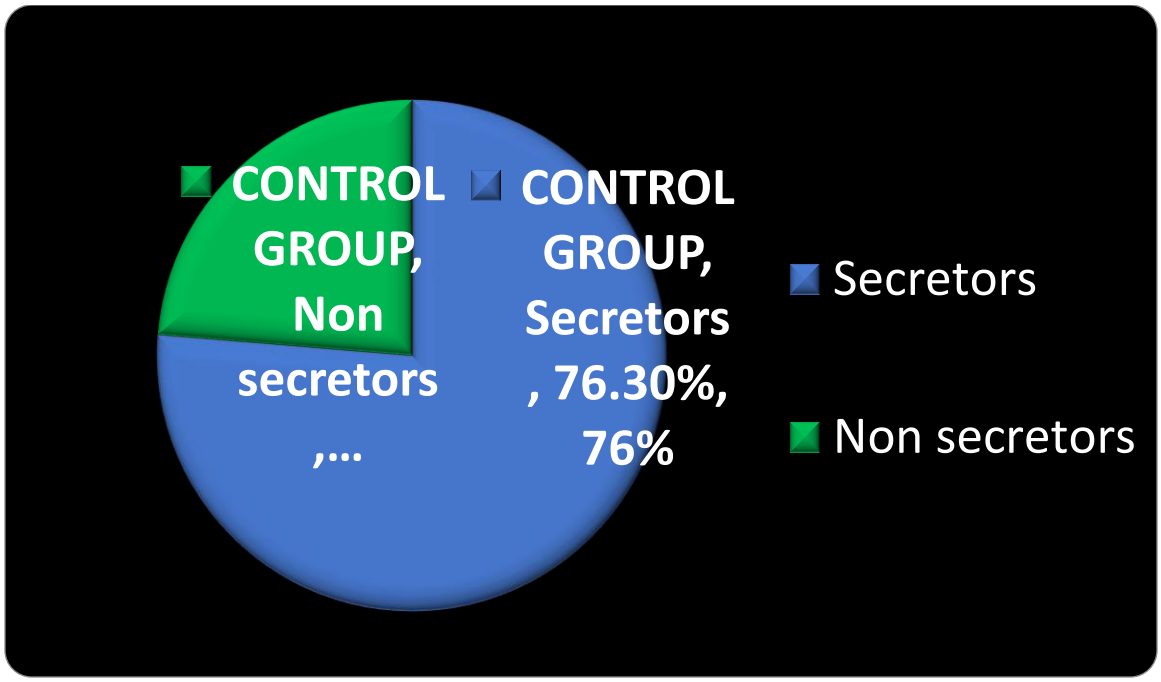

TABLE III: Distribution of secretors and non secretors between cases and controls

			Groups		Total
			Cases	Controls	
SECRETOR STATUS	NON SECRETORS	Count	21	13	34
		%	38.2%	23.6%	30.9%
	SECRETORS	Count	34	42	76
		%	61.8%	76.4%	69.1%
Total		Count	55	55	110
		%	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.724[a]	1	.099		
Continuity Correction[b]	2.086	1	.149		
Likelihood Ratio	2.744	1	.098		
Fisher's Exact Test				.148	.074

N of Valid Cases	110				

4. BLOOD GROUP DISTRIBUTION (Table IV) (Figure 4)

Out of the total 55 cases, 18 cases (32.8%) had blood group A, 2 cases (3.6%) had blood group AB, 21 cases (38.1%) had blood group B and 14 cases (25.5%) had blood group O. In the control group, out of the total 55 subjects, 15 subjects (27.3%) had blood group A, 3 subjects (5.5%) had blood group AB, 24 subjects (43.6%) had blood group B and 13 subjects (23.6%) had blood group O. There was no statistically significant difference in blood groups between cases and controls (p value: 0.490)

Figure 4: DISTRIBUTION OF BLOOD GROUPS

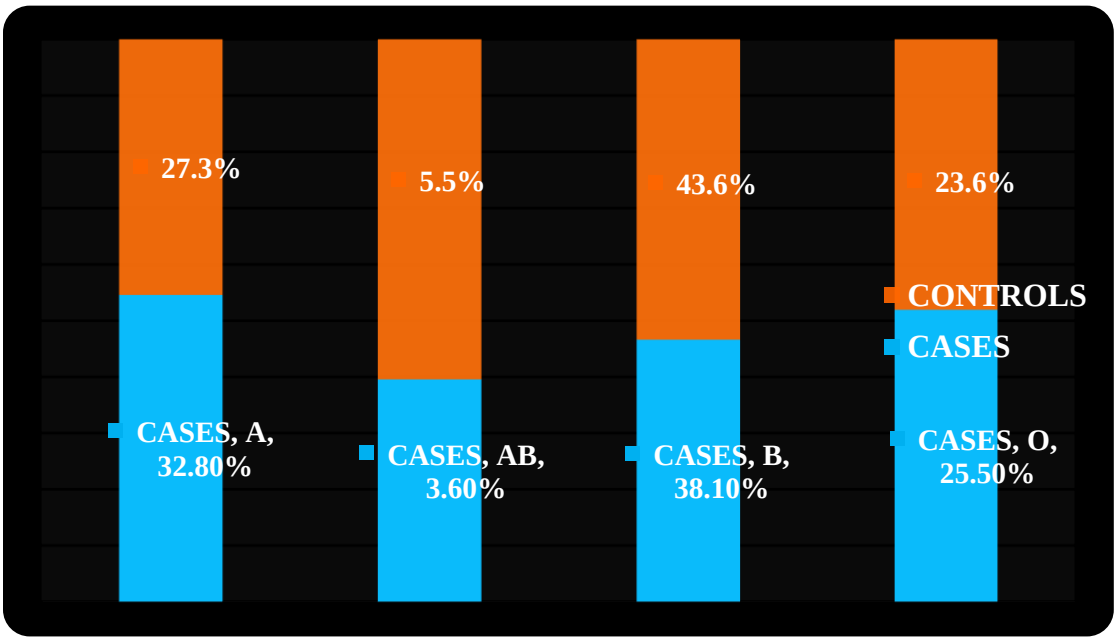

TABLE IV: DISTRIBUTION OF BLOOD GROUPS

			Groups		Total
			Cases	Controls	
BLOOD GROUP	A	Count	18	15	33
		%	32.8%	27.3%	30%
	AB	Count	2	3	5
		%	3.6%	5.5%	4.6%
	B	Count	21	24	45
		%	38.1%	43.6%	40.9%
	O	Count	14	13	27

		%	25.5%	23.6%	24.5%
Total		Count	55	55	110
		%	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.418[a]	4	.490
Likelihood Ratio	4.578	4	.333
N of Valid Cases	110		

a. 4 cells (40.0%) have expected count less than 5. The minimum expected count is 1.50.

5. BLOOD GROUPS AND SECRETOR STATUS (Table V)(Figure 5)

In case group, a total of 18 subjects had blood group A/A1 (14 had blood group A and 4 had blood group A1), out of which, 12 subjects (66.66%) were secretors and 6 subjects (33.33%) were non secretors of blood group A/A1. 21 subjects had blood group B, among which, 16 subjects (76.19%) were secretors and 5 subjects (23.80%) were non secretors of blood group B. Only 2 subjects in the case group were of AB blood group and both (100%) were secretors. 14 subjects had blood group O out of which, 4(28.57%) subjects were secretors and 10(71.42%) subjects were non secretors. In control group,15 subjects had blood groups A/A1(11 had blood group A and 4 had blood group A1), out of which, 14 subjects (93.33%) were secretors and 1 subject (6.66%) was a non-secretor.24 subjects had blood group B out of which 23 subjects (95.83%) were secretors and 1 subject (4.16%) was a non-secretor.3 subjects had blood group AB which included 2(66.66%) secretors and 1(76.92%) non secretor. 13 subjects had blood group O out of which 3 subjects (23.07%) were secretors and 10 subjects (76.92%) were non secretors. There was no statistically significant difference between the secretor status of the various blood groups (p value: 0.939)

Figure 5 A: ABO BLOOD GROUPS AND SECRETOR STATUS (CASE GROUP)

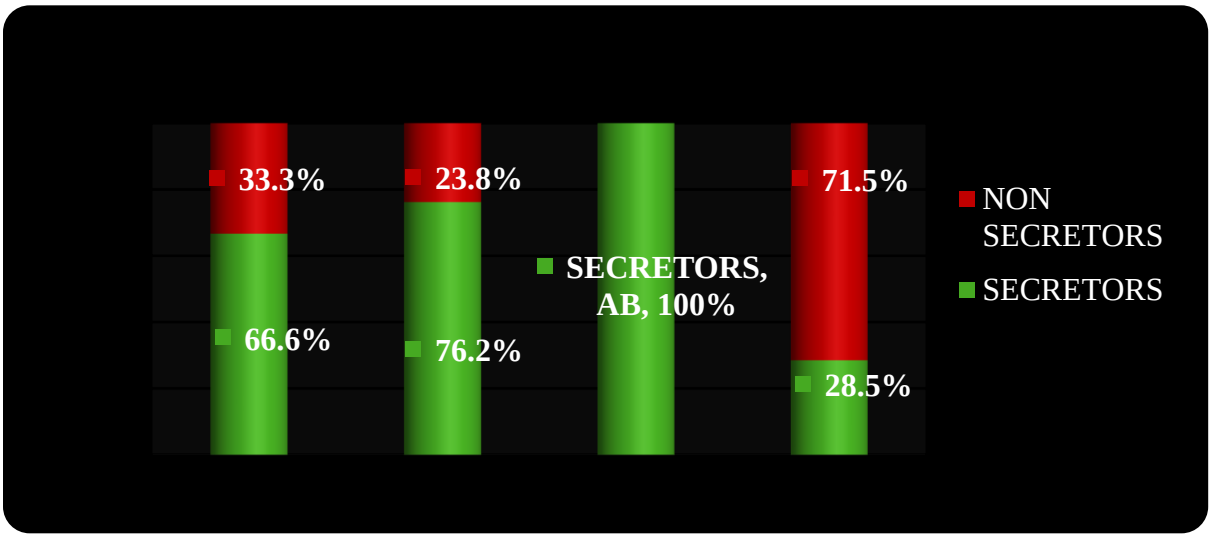

Figure 5 B: ABO BLOOD GROUPS AND SECRETOR STATUS (CONTROL GROUP)

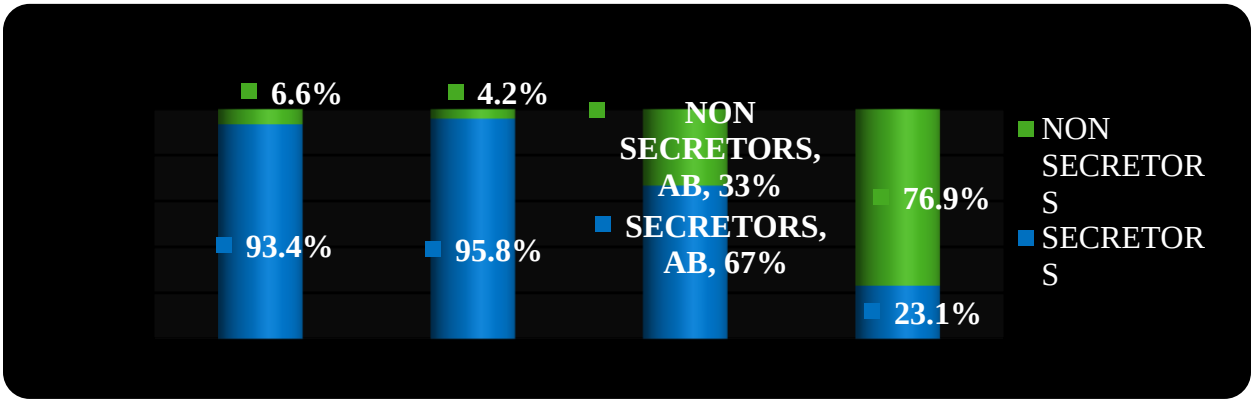

TABLE V : DISTRIBUTION OF SECRETOR STATUS OF ABO BLOOD GROUPS

BLOOD GROUPS	CASES			CONTROLS		
	TOTAL	S	NS	TOTAL	S	NS
A	18	12(66.66%)	6(33.33%)	15	14(93.33%)	1(6.66%)
B	21	16(76.19%)	5(23.80%)	24	23(95.83%)	1(4.16%)
AB	2	2(100%)	0(0%)	3	2(66.66%)	1(33.33%)
O	14	4(28.57%)	10(71.42%)	13	3(23.07%)	10(76.92%)

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.797[a]	4	.939
Likelihood Ratio	.799	4	.939
N of Valid Cases	110		

a. 4 cells (40.0%) have expected count less than 5. The minimum expected count is 2.50.

6. SECRETOR STATUS DISTRIBUTION BETWEEN OPMDs AND CONTROLS (Table VI) (Figure 6)

In terms of the secretor status with regard to gender, the OPMD group had 26(47.27%) males and 8(14.5%) females who were secretors and 17(30.9%) males and 4(7.3%) females were non secretors. The control group comprised of 37(67.3%) males and 5(9.1%) females who were secretors and 6(10.9%) males and 7(12.7%) females who were non secretors.

Figure 6: SECRETOR STATUS DISTRIBUTION BETWEEN OPMDs AND CONTROLS

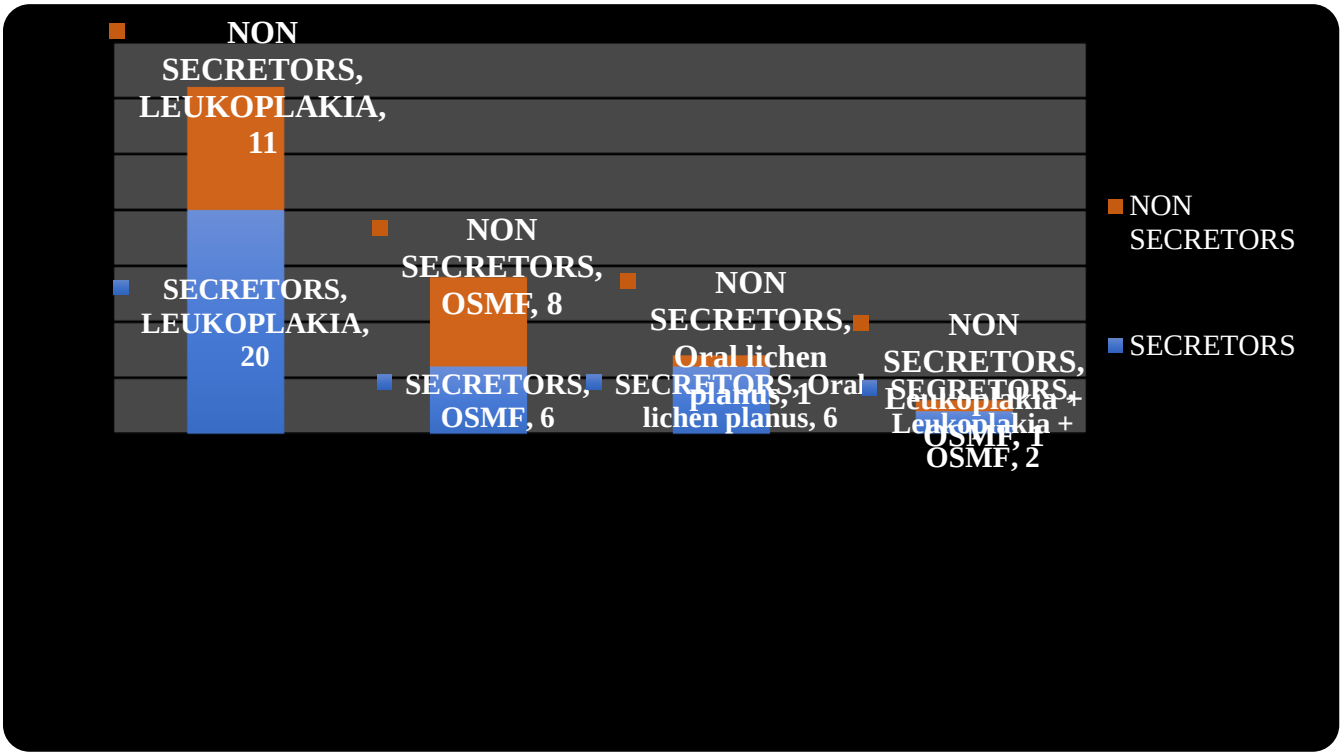

TABLE VI : SECRETOR STATUS DISTRIBUTION BETWEEN CASES AND CONTROLS

STUDY GROUP	CASES		CONTROL	
Secretor status	S	NS	S	NS

Males	26(47.3%)	17(30.9%)	37(67.3%)	6(10.9%)
Females	8(14.5%)	4(7.3%)	5(9.1%)	7(12.7%)

7. DISTRIBUTION OF OPMDs (Table VII)

Among the different OPMDs there were a total of 31 cases of leukoplakia out of which 20 cases were secretors and 11 cases were non secretors. 14 cases of oral submucous fibrosis were present among which 6 cases were secretors and 8 cases were non secretors. There were 7 cases of oral lichen planus out of which 6 cases were secretors and 1 case was a non-secretor.3 cases presented with both leukoplakia and oral submucous fibrosis among which 2 cases were secretors and 1 case was a non-secretor.

TABLE VII: DISTRIBUTION OF ORAL POTENTIALLY MALIGNANT DISORDERS

OPMDs	**TOTAL**	**S**	**NS**
Leukoplakia	31(56.3%)	20(64.5%)	11(35.5%)
OSMF	14(25.4%)	6(42.8%)	8(57.2%)
Oral lichen planus	7 (12.8%)	6(85.7%)	1(14.3%)
Leukoplakia + OSMF	3(5.5%)	2(66.6%)	1(33.4%)
TOTAL	55(100%)		

DISCUSSION

DISTRIBUTION OF OPMDs

Potentially Malignant Disorders is defined by WHO 2005 as the risk of malignancy being present in a lesion or condition either at time of initial diagnosis or at a future date. Many etiological factors are related to the development of OPMD; however, the main associated factors are tobacco and alcohol. These disorders are associated with genetic alterations that may lead to OSCC transformation. Oral leukoplakia (OL), oral submucous fibrosis (OSMF) and oral lichen planus (OLP) are the main conditions that are described as OPMDs. Early detection of OPMDs and elimination of primary risk factors such as smokeless and smoking tobacco help in reduction of oral cancer.

In our study, out of the total 55 cases in the case group, there were 31 cases of leukoplakia. 14 cases of oral submucous fibrosis, 7 cases of oral lichen planus and 3 cases that presented with both leukoplakia and oral submucous fibrosis. In a similar study by Rai P et al(7), Out of 45 patients with OPMDs, 24 subjects were with oral submucous fibrosis; 13 subjects with oral lichen planus and 8 subjects had leukoplakia.

DISTRIBUTION OF ABO BLOOD GROUPS

In our study, out of the total 55 cases, 18 cases (32.8%) had blood group A, 2 cases (3.6%) had blood group AB, 21 cases (38.1%) had blood group B and 14 cases (25.5%) had blood group O. In the control group, out of the total 55 subjects, 15 subjects (27.3%) had blood group A, 3 subjects (5.5%) had blood group AB ,24 subjects (43.6%) had blood group B and 13 subjects (23.6%) had blood group O.

In a study by Bakhtiari S et al(8) to investigate the relationship between secretion or non-secretion of blood group antigens into the saliva and oral lichen planus, the distribution of blood groups among 30 patients with oral lichen planus was: blood group A = 7 (11.7%); blood group B = 10 (16.7%); blood group O = 8 (13.3%), and blood group AB = 5 (8.3%). The distribution for among 30 subjects in the control group was: blood group A = 13 (21.7%); blood group B = 5 (8.3%); blood group O = 6 (10%), and blood group AB = 6 (10%).

In 2012, Jaleel BF and Nagarajappa R(2) conducted a study on a study sample that comprised of 235 oral cancer patients and 812 controls to evaluate if any of the ABO blood groups are associated with an increased risk for oral cancer. Out of 235 oral cancer cases, 68 (29%) had blood group A, 63 (27%) had B, 11 (5%) had AB and 93 (39%) had blood group O. Among the controls, 177 (22%) had blood group A, 191 (23%) had B, 42 (5%) had AB and 402 (50%) had blood group O. The relative frequency (%) of blood group A was higher in the oral cancer group than in the control group and the difference was statistically significant.

ABO BLOOD GROUPS AND ORAL DISEASE

The ABO blood group system has remained an area of interest for several years. Several studies have been carried out in the past to determine the likelihood of an association between blood groups and various diseases such as some types of cancers, dental caries, skin disease, heart disease, etc. However, there have always been differences in the results.

A study by Vivek S et al (2013),(9) 49 revealed that subjects blood group O had a greater propensity for periodontitis. Furthermore, studies conducted by Burford Mason AP (1988)(10) 33 showed blood group O and non-secretion of blood group antigens are cumulative risk factors for oral carriage of C.Albicans.

Dabelsteen E and Pindborg JJ (1973) (11)evaluated the amount of blood group antigen A in oral carcinomas from 12 patients by making comparisons with the amount of antigen in normal mucosa of the same patient. It has shown that there is a marked decrease in the quantity of antigen A in most carcinomas. Koregol AC et al (2010)(12), Jaleel and Nagarajappa (2012)(2) and Jacobina J et al (2015)(13) have conducted studies that show that those with blood group A have an increased tendency towards development of oral cancers. On the other hand, a case control study conducted by Mortazavi H et al (2014)(3) demonstrated the frequency of blood group B was significantly higher in oral cancer patients than controls.

Reddy VKG et al (2016)(14) had done a study to evaluate whether ABO blood group is related to OSMF risk and concluded that subjects with blood group A were at a higher risk of developing OSMF in comparison to others.

In contrast to the above studies, the study by Rai P et al (2015)(7) could not establish a statistically significant relationship between blood groups and oral potentially malignant disorders. Similarly, studies by Moshaverinia M et al (2014)(15) could not find such a significant relationship between oral lichen planus and blood group antigens and Hallikeri K et al (2014)(16)failed to find a statistically significant association between ABO blood groups and oral submucous fibrosis. Similar to these studies, our study did not show a statistically significant association between ABO blood groups and oral potentially malignant disorders.

DISTRIBUTION OF SECRETOR STATUS

The term ABO secretor refers to people who secrete blood group antigens in their body fluids such as saliva, sweat, tears, semen, and serum, and non-secretors refer to those who do not secrete their blood group antigens in their body(17). The secretor gene (fucosyl transferase 2) is inherited in the autosomal dominant pattern: Se is the dominant form, and se is the recessive form. Therefore, SeSe or Se are secretors, and sese are non-secretors(18). According to

studies, the lack of blood type antigens in body discharge is considered a limitation, as it increases the susceptibility to certain types of diseases, including peptic and duodenal ulcers, periodontal disease and candidiasis(19).
In our study, out of 55 cases in the OPMD group had 34 (61.8%) subjects who were secretors and 21(38.2%) subjects who were non secretors. The control group (55 controls) comprised 42(76.4%) subjects who were secretors and 13 (23.6%) subjects who were non secretors. There was no significant difference between groups concerning secretor status (p value= 0.99)
Similarly, in a study by Bakhtiari et al in 2016(20) done to investigate the relationship between secretion or non-secretion of blood group antigens into the saliva and oral lichen planus on 30 patients with oral lichen planus as the case group and 30 age and sex matched subjects without oral lichen planus as control group showed that most subjects in both groups of their study were secretors [n = 49 (81.7%)]. In the case group, 25 (84.4%) were secretors while 5 (16.6%) were non-secretors. In the control group, 24 (80.0%) were secretors while 6 (20.0%) were non-secretors. There was no significant difference between groups concerning secretor status (p = 0.73).

SECRETOR STATUS AND OPMDs

It has been demonstrated in a number of earlier studies on the etiology and pathogenesis of certain diseases that the secretor status (ABO (H) blood group antigens) of a patient may possibly be a factor influencing the development of systemic diseases (Clark CA et al, 1959(21); Foster MT & Labrum AH, 1976(22); Kinane DF et al,1982(23), Holbrook WP and Blackwell CC, 1989(24); Lomberg H et al., 1992)(25). Studies on the relationship between secretor status and diseases such as pre-malignant and malignant oral lesions have also shown varied results.
The results of our study showed no statistically significant association between the salivary secretor status of the subject and their susceptibility to oral potentially malignant disorders.
Similar to our study, Lamey PJ et al., (1994)(26), Cerovic R et al., (2008)(27)and Bakhtiari S et al (2016)(8) found no significant relationship between secretor status and oral cancer.

SUMMARY

A study was conducted among 110 consecutive patients who reported to the dental OP of the department of Oral medicine and radiology in a teaching hospital and satisfied the inclusion criteria from March to August 2019, after obtaining a written informed consent. The study had obtained ethical clearance from the Institutional review board before its commencement. The study sample consisted of 110 subjects with 55 patients in each of the two groups (a) Patients with potentially malignant disorders, including cases of OSMF, oral leukoplakia and oral lichen planus and (b) healthy control group comprising of 55 age and sex matched healthy controls with no history of tobacco use. The results revealed that:

1. There was no statistically significant difference in age groups between cases and controls

2. There was no statistically significant difference between the two groups with regard to gender

3. There was no statistically significant difference between cases and controls with regard to their salivary secretor status

4. There was no statistically significant difference between the secretor status of the various blood groups

CONCLUSION

Numerous studies in literature have reported an association between the subject's salivary secretor status and their chances of developing disease but this study shows a different result as no such association could be established, which was in agreement with the null hypothesis that was predicted at the beginning of the study. This suggests that the secretor status of an individual may neither be a risk factor nor act as a protection against oral potentially malignant

disorders. There were also several studies that showed a positive correlation between ABO blood groups and oral potentially malignant disorder. However, the result of this study does not suggest any particular blood group to have a significant association with oral potentially malignant disorders. The results of our study have to be validated in further multi-centric studies with appropriate stratification for epithelial dysplasia. However, the importance attached to the salivary secretor status of ABO blood groups in oral potentially malignant disorders needs reconsideration in view of the results of our study.

LIMITATIONS

1. The present study did not have enough cases in each subgroup of oral potentially malignant disorders for statistical analysis. This could be attributed to the smaller sample size which can be overcome in future studies.

2. All the participants in the study were those who reported to our dental OP and may not be fully representative of the general population.

3. This study did not include patients with oral cancer. Thus, the possible correlation between the ABO blood groups, salivary secretor status and oral cancer was not explored.

FUTURE DIRECTIONS FOR RESEARCH

1. Future studies can be carried out with a larger sample size and at multiple centres to further validate the study results.

2. Research in future can be directed at developing a chairside rapid assay that can easily determine the salivary secretor status.

3. Salivary estimation of ABO blood groups could become a non-invasive method for testing blood groups in future.

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