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ABO BLOOD GROUPS AND RH FACTOR ASSOCIATION WITH ORAL SUBMUCOUS FIBROSIS: A CLINICAL SHORT STUDY IN JODHPUR POPULATION.

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Conflicts of Interest: Nil

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Abstract:

BACKGROUND: The ABO blood group antigens are present on the surface of red blood cells and various epithelial cells. As majority of human cancers are epithelial in origin, changes in blood group constituents an important aspect of human precancerous conditions .The aim of the study is to establish clinical usefulness of ABO blood group as predisposing factor in early diagnosis and management of patients with Oral submucous Fibrosis.

Materials and Methods: The study sample consists of 130 control and 130 Oral submucous Fibrosis Patients. All samples were subjected to blood group testing and histo-pathologic examination. **Passi D et al (2017)** classification system has been used for grading of Oral Sub mucous Fibrosis.

Result: Probability of developing **Grade I** and **Grade II** oral submucous fibrosis is high in **A^{+ve} blood group** people associated with habit of consuming arecanut, gutkha and other tobacco containing products. Likewise **B^{+ve} blood group** people with habit of consuming tobacco products are more prone to develop **Grade III** and **O^{+ve} blood group** are prone for developing **Grade IV** OSMF

Conclusion: Blood group with Rh type should include the other risk factor of the disease to get the knowledge of patient's risk. Further studies need to be done on large scale with inclusion of Hb % value to elucidate the relationship with ABO blood group.

Keywords: ABO Blood Group, Oral submucous Fibrosis (OSMF), antigen (Ag)

Introduction:

Oral cavity is prone to various form of ailment with multifarious clinical appearance from red, white to mixed region. Precancerous condition like Oral submucous fibrosis is a generalized state associated with significantly increased risk of cancer characterized as chronic disease affecting any part of oral cavity and sometimes pharynx[1]. Occasionally proceeded by and/ or associated with vesicle formation and always associated with juxta epithelial inflammatory reaction followed by fibroelastic changes of lamina propria with epithelial atrophy leading to stiffness of oral mucosa and causing trismus and inability to eat ***(J.J. Pindborg and Sirsat 1966)***. In **Sushrut Samhita** written by **Sushrut** (600 B.C.) a condition called ***Vidari***, was having classification of oral and oral disease showing same symptomatology of OSMF. First was described among five African women of indian origin as ***Atrophia Ideopathica MucosaeOris*** by ***Schwartz 1952*** and later ***Joshi*** from Mumbai in 1953 used the term ***Oral submucous Fibrosis***. The rate of occurrence of oral cancer is progressively increasing since last 2 decade[2,3]. Umpteen explorations have been searching for specific, credible and easily identifiable biomarkers, which differentiate premalignant lesion and conditions.

The first study was done by ***Arid Butnell (1953)*** on correlation between ABO Blood group type and

stomach cancer. The ABO blood type discovered by **Karl Landsteiner** in 1901 ABO blood group system with Rh factor is an important axiomatic between blood transfusion, organ transplantation and in case of Erythroblastosis foetalis. This system consists of blood group A, B, AB and O. Presence of Rh factor decides either the blood group is Rh positive or in case of its absence, it will be Rh negative. The blood group antigens and Rh factor present on the epithelial surface[4,5]. Since many of human cancers are epithelial in origin hence changing in blood group Antigen can be an important aspect. Among the Indian population O^{+ve} is most commonly found (37.12%) followed by B^{+ve} (32.25%), A^{+ve}(28.88%), AB $^{+ve}$ (7.74%), O^{-ve} (1.79%), B^{-ve} (1.47%), A^{-ve} (0.57%), AB $^{-ve}$ (0.49%).

The relationship of pathologic conditions, their incidence with blood group had been studied in many cancers like gastric, breast, skin, pancreatic, salivary glands, lungs, laryngeal, hypopharyngeal, gynaecologic, collateral, urinary bladder, bone, renal, testicular and prostate. Apart from malignant transformation, ABO blood group can also be associated with several diseases like coronary artery disease, goitre, diabetes mellitus, malaria, pulmonary tuberculosis, leprosy, syphilis, gout, glucose-6-phosphate dehydrogenase deficiency, hepatic dysfunctions[6,7,8].Hereupon, the requirement of this study was felt to analyse Blood group along with Rh factor and OSMF (Mild, Moderate, Severe) that may provide information on risk factor to check out the prevalence of blood group with Rh factor, habits and grade of dysplasia were ruled out[9,10].

One study has been done that showed correlation between ABO blood group and oral precancers but no study has been done to correlate ABO blood group along Rh factor with OSMF[11,12]. The current study is an attempt to correlate ABO blood group along Rh factor and frequency of OSMF with all 3 clinical stages.

Materials and Methods

The study samples were selected from or hospital and prior consent has been taken from all participants. The study will include 260 patients, 130 control and 130 OSMF, confirmed by histopathologic examination along with Anti ABO blood grouping kit and patient's blood to analyse blood group. The study group patients were having the habit of tobacco consumption on an average since 5 years with no systemic disease and the control group patients were free of tobacco consumption and any systemic disease. The patient's age is ranging from 20-50 years with 3:1 male and female ratio. All the blood group testing and histopathological examination was done ta clinical pathology Lab.

Statistical analysis-

The statistical analyses were carried out to obtain the prevalence and comparison of blood groups among the study and control group by Z-test using STATA software version 8.0. The comparison between grades of fibrosis and blood group was established using Chi-square test by SPSS version 11.5.

Result

After the study on total 260 patients out of which 130 were control and 130 were study group. The study group was further divided into four grades among which Grade I includes 57 patients followed by 39, 26, 8 respectively for Group II, III and IV.

By table1, we can see that among the **control group** blood group **B^{+ve}** is most common with 38(29.23%) controls followed by **O^{+ve}, A^{+ve},$AB^{+ve}$$O^{-ve}$, B^{-ve}, A^{-ve}, AB^{-ve}** with the frequency of 26(20%), 25(19.23%), 24(18.46%), 5(3.84%), 5 (3.8%), 4(3.07%), 3(2.30%) respectively.

In case of study group for **Grade I** OSMF **A^{+ve}** is the commonest with frequency of 19 (33.3%) followed by O^{+ve} (22.80%) and AB^{+ve}(19.29%)respectively.

In case of study group for **Grade II** OSMF **A^{+ve}** is the commonest with frequency of 19 (30%) followed by B^{+ve} 9(23.07%) and O^{+ve}5(12.8%)AB^{+ve} 4(10.25%)respectively.

In case of study group for **Grade III** OSMF **B^{+ve}** is the commonest with frequency of 12 (46.15%%) followed by and **AB^{+ve}** 6(23.07%) and **A^{+ve}** 4(15.38%) respectively.

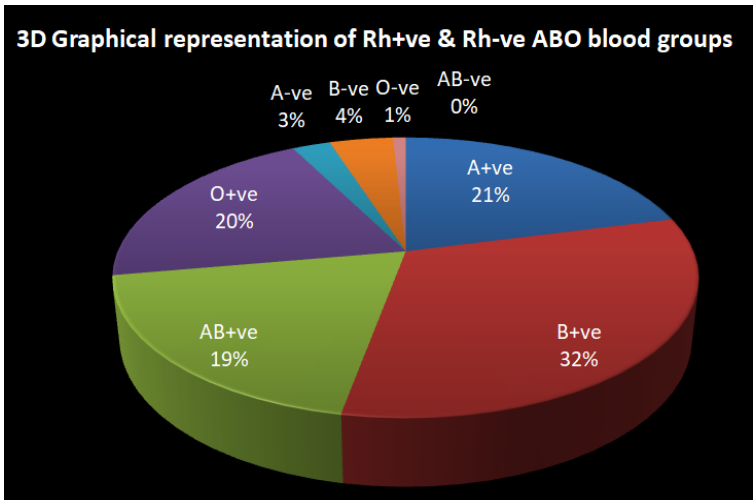
In case of **Grade IV** OSMF **O^{+ve}** is the commonest with frequency of 3(37.5%) followed by B^{+ve} and AB^{+ve} sharing the same frequency as 2(25%), A^{+ve} 1(12.5%) respectively.

Table 1: showing frequency of blood group among control and study group

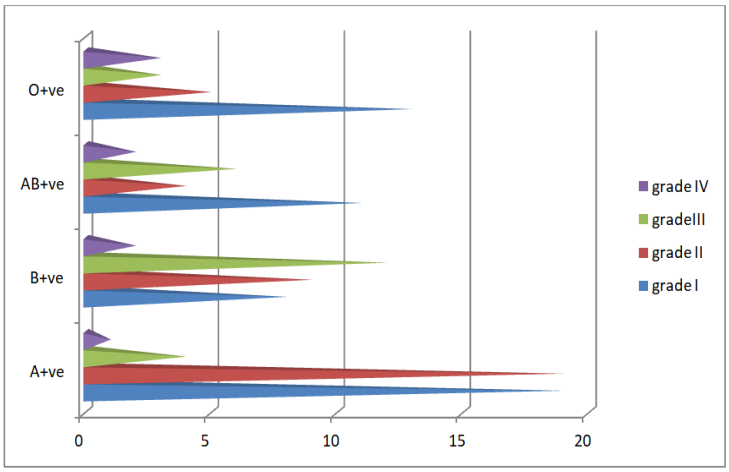
	Frequency of blood group among control and study group					
Blood Group	Control group	Study Group total	Study Group			
			Grade I	Grade II	Grade III	Grade IV
A^{+ve}	25	43	19(33.3)	19(30)	4(15.38)	1(12.5)
B^{+ve}	38	31	8(14.03)	9(23.07)	12(46.15)	2(25)
AB^{+ve}	24	23	11(19.29)	4(10.25)	6(23.07)	2(25)
O^{+ve}	26	24	13(22.80)	5(12.8)	3(11.53)	3(37.5)
A^{-ve}	4	3	2(3.50)	1(2.50)	0(0)	0(0)
B^{-ve}	5	5	4(7)	0(0)	1(3.84)	0(0)
AB^{-ve}	3	0	0(0)	0	0(0)	0(0)
O^{-ve}	5	1	0(0)	1	0(0)	0(0)

Table 2: Comparison between control and study groups for high probability group-

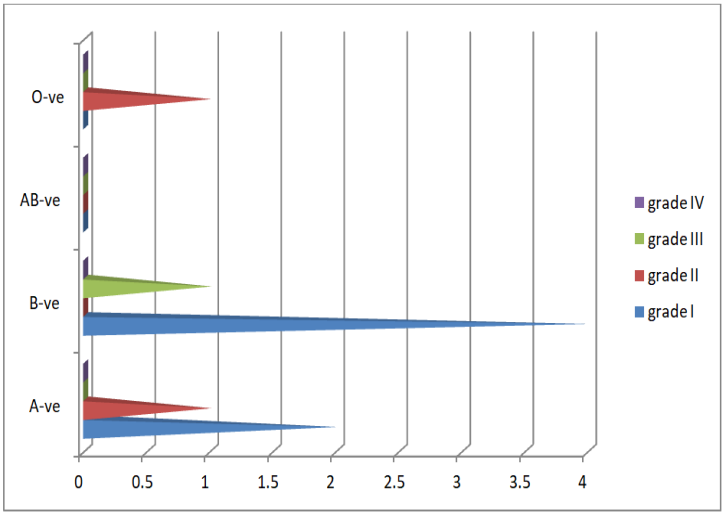
Blood groups	Control group Vs Study group Z value	P value
A+ve	-2.42	0.01
B+ve	2.97	0.001
AB+ve	-1.65	0.07
O+ve	0.38	0.01



Graph1:



Graph 2: Bar graph showing comparison between different ABO RH+ve blood groups



Graph 3: Bar graph showing comparison between different ABO RH-ve blood groups

Discussion

Blood Groups are the complex chemical systems found on the surface of blood cells. Across 36 blood group systems, 308 different blood group antigens have been found. Out of these, ABO blood groups system is most common, associated with Rh (D) type antigen. ABO blood group genes are mapped at 9q34.2[10,11]. Table 1 shows frequency of different ABO blood groups with control group. As per the data, Grade I and Grade II OSMF patient has A+ve blood group in maximum number. B+ve is in probability in Grade III OSMF and Grade IV has high probability for O+ve blood group. Table 2 shows a comparative tabulation between control group and study group based on Z value and P value. In this, A+ve has highest probability for Grade I & II OSMF with significant "P value" of 0.01. B+ve blood group is more prevalent in Grade III OSMF with "P value" of 0.003 [highly significant]. O+ve blood group prevalence is in Grade IV OSMF group, with "P Value" of 0.01. On contradictory to this,a study by Jie Meng et al[15] shows no significant correlation between ABO blood group and ovarian cancer. Correlation between P value and blood group was clearly established in this study. It is one of its kind of study that has evaluated and analysed ABO relationship with different stages of OSMF. Graph 1,2,3 shows 3D representation of ABO blood groups and Bar graph with RH+ve and RH-ve entities respectively.

Conclusion-

It is one of a kind of study that has evaluated and analysed ABO relationship with different stages of OSMF. The relative frequencies of the ABO blood groups in oral pre-cancers have the strongest association with blood group "A"[16] But the racial and ethnic distribution of blood groups and size of sample is an important factor for predicting the cancer risk. The present study draws some clues regarding the trends in oral different grades of OSMF occurrence. Thus we emphasize that blood group type needs to be considered together with other risk factors in oral precancerous patients.

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