IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 14, Issue 2 Ver. II (Feb. 2015), PP 96-99
www.iosrjournals.org

Relationship of ABO Blood Groups in Patients with Habit Induced Oral Submucous Fibrosis and Oral Cancer

Trupti Dinesh Chordia[1], Ashok Vikey[2], Dipti Chordiya[3], Yashpal Samdariya[3]
[1] *Post-graduate student, Department of Oral Pathology and Microbiology, Sri Aurbindo College Of Dentistry, Indore, (Madhya Pradesh)*
[2]*Professor & Head, Department of Oral Pathology and Microbiology, Sri Aurbindo College Of Dentistry, Indore, (Madhya Pradesh)*
[3]*Private practitioners*

Abstract:
Aim: *To evaluate whether any of the ABO blood groups are associated with an increased risk for OSMF and oral cancer.*
Materials and Methods: *The present study was conducted at Department of Oral & Maxillofacial Pathology, Sri Aurbindo College of dentistry, Indore, after obtaining permission from the Institutional review board. The study sample comprised 60 patients of each histologically diagnosed Oral Squamous Cell carcinoma (OSCC, n=30), clinically diagnosed oral Submucous Fibrosis (OSMF n=30) and 30 control groups. For statistical analysis, Chi-square Test using Graph Pad prism 5 software to assess the relationship between ABO blood groups and OSCC, OSMF and control group.*
Results: *It was found that people with blood group A had almost 60-70 % increased risk of developing OSCC with most prevalant being Well Differentiated OSCC as compared to people of other blood groups. Similarly blood group A was also found to be more prevalant for cases of stage II OSMF.*
Conclusion: *By employing a simple blood grouping test during community field programs, people with blood group A in the age group of 40–59 years having tobacco chewing habits can be apprised that they are more at risk to develop oral cancer than people with other blood groups.*
Keywords- *OSCC, OSMF, ABO blood group and oral cancer risk.*

I. Introduction

Cancer in its all forms accounts for about 12% of deaths throughout the world. Cancer is a unique disease characterized by abnormal growth of cells which have the ability to invade adjacent tissues and even distant organs. If the cancer progresses beyond the stage that it can be successfully removed, it may even result in death of the individual. The term oral cancer generally refers to carcinoma of oral mucosal origin. In India, oral cancer accounts for about 40% of all cancers of the body and is a major public health problem with sufficient morbidity and mortality, emerging as a killer disease. Oral cancer has multifactorial etiology and is significantly associated with risk factors of the individual's lifestyle, particularly, chronic use of tobacco, spicy food, alcohol and smoking. Many studies have indicated that genetic factors also have an influence on the etiology of cancer as the genes have been implicated in development and progression of oral cancer.[1, 2] It is interesting to emphasize the significance of genetic factors in patients having oral cancer, to find out whether any innate factor is also associated with oral cancer. It may useful to study the blood groups in determining genetic susceptibility of cancer.

In India and in western countries, many workers have tried to find out the relationship, between ABO blood groups and different forms of cancers involving various parts of the body like cervix, stomach, breast etc. However, if such a relationship between the blood group and diseases can be established, it may be conceded that the presence of the particular blood group or genes or antigen has somehow increased the susceptibility to the diseases.[3]

Oral cancer has been estimated to be less than 3% of all cancers, but it is the eighth most common cancer in men and fifteenth main cause in women. It is found in 270 000 patients annually worldwide with the incidence of 1 in 20 000; this rises to 1 in 1100 in males of 75 years old and elder. Oral cancer is the third most common malignancy after the cervix and stomach in developing countries. According to Amagasa, the number of individuals dying from pharyngeal and oral carcinoma is increasing approximately as threefold. [4-7] Tobacco, alcohol and nutritional condition have been described as well-known factors associated with the increased risk of oral cancer. Other possible factors in the development of oral cancer such as viral infections and different expression of ABO blood group antigens are also being studied. [8] Hence, the present study is planned to find out the relationship of habit related oral submucous fibrosis and oral cancer with ABO blood groups.

II. Materials And Methods

After approval from the institutional ethical committee, 90 Subjects were included in the study. They will be randomly selected from patients attending the Sri Aurobindo Dental College and Hospital, Indore. The clinical diagnosis of Oral cancer was confirmed by histo-pathological examination. Oral Submucous fibrosis will be diagnosed and confirmed clinically. Informed consent will be obtained from all the participants. The study mainly included 3 groups group I 30 Oral Submucous Fibrosis patients, group II 30 Oral Cancer patients and 30 Healthy individuals as control group. ABO blood grouping was done based on slide method. A drop of blood was drawn and transferred into the test tube containing 0.9% NaCl or Na citrate solution. Clean glass slides was taken with anti-sera A, anti-sera B and a drop of isotonic saline as control all separately. One or two drops of diluted blood is placed on each slide and mixed. Presence of agglutination is observed and confirmed under microscope. 'A' blood group agglutinates with anti 'A' sera. 'B' blood group agglutinates with anti 'B' sera. 'AB' blood group agglutinates with both anti 'A' and anti 'B' sera. 'O' blood group does not show agglutination with both anti 'A' and anti 'B' sera.[9] Patients included in this study were clinically diagnosed Oral submucous fibrosis and oral malignancy as well as histo-pathologically suggested & diagnosed oral malignancy. Evaluation of the data is based on the results obtained from the blood grouping done using slide method and the results were statistically evaluated using Chi square and Odds ratio was evaluated by Graph Pad prism 5 software. Out of 30 patients of OSMF group, maximum people having blood group A (65%) **Table 1 and Graph 1** were found to have a greater tendency to develop OSMF with the odds ratio 3.98 **Table 2**. With respect to OSCC **Table 3 and graph 2** maximum of 73% **c**ases shown prevalence in patients with blood group A with odds ratio of 39 **Table 4**.

III. Figures And Tables

Table 1. Patients with ABO blood groups in various stages of OSMF

Sr no	Patients with OSMF	Blood groups				TOTAL
		A	B	AB	O	
	STAGE I	7	3	3	2	15
	STAGE II	21	8	1	4	34
	STAGE III	5	1	1	1	8
	STAGE IV	2	1	-	-	3
	CONTROL	4	37	6	13	60

Graph 1. Patients with ABO blood groups in various stages of OSMF

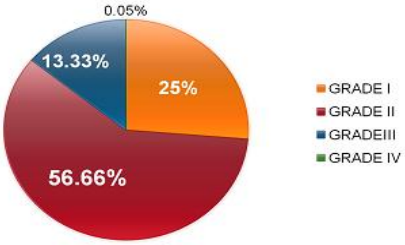

Table 2. ODDS ratio for patients with OSMF

TYPE OF BLOOD GROUP	ODDS RATIO (CONFIDENCE INTERVAL)
A	3.98 (1.76-8.99)
B	0.12 (0.05-0.30)
AB	0.81 (0.23-2.8)
O	0.46 (0.16-1.28)

Graph 2. Patients with ABO blood groups in different stages of SQUAMOUS CELL CARCINOMA

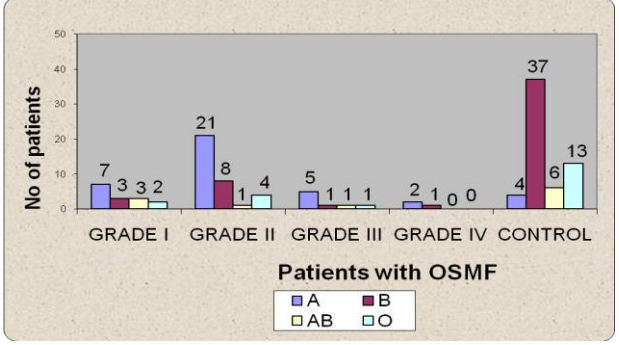

Table3. Patients With Abo Blood Groups In Different Stages Of Oral Squamous Cell Carcinoma

Sr no	Patients with types of cancer	Blood groups				TOTAL
		A	B	AB	O	
	WELL DIFFERENTIATED SCC	18	4	-	2	24
	MOD DIFFERENTIATED SCC	17	5	5	1	28
	POORLY DIFFERENTIATED SCC	5	3	-	-	8
	CONTROL	4	37	6	13	60

Table 4. ODDS ratio for patients with OSMF

BLOOD GROUP	ODDS RATIO (CONFIDENCE INTERVAL)
A	27.00 (8.55-85.19)
B	0.12 (0.05-0.30)
AB	0.81 (0.23-2.8)
O	0.19 (0.05-0.70)

IV. Discussion

Human genetics is much more than the study of mere hereditary diseases. It has emerged as a basic biological science for understanding the endogenous factors in health and disease and the complex interaction between nature and nurture. Blood groups A, B and O were discovered by Karl. Landsteiner in 1900 and the 4th group AB was later described by his pupils, Von Decastallo and Sturli, in 1902. [10] The knowledge of association between blood groups and disease frequencies evolved in the early part of the last century. Since then, we have come a long way in the study of association between blood groups and specific diseases, i.e. both systemic and oral diseases. This study clearly demonstrates that there exists a relationship between ABO blood groups and oral cancer. People having blood group A were found to have a greater tendency to develop oral cancer. This can be explained by the fact that blood group antigens, in addition to being present on red blood cell membranes are also found on epithelial cells of various other tissues, including the oral mucosa. The relative down regulation of glycosyl transferase that is involved in the biosynthesis of A and B antigens is seen in association with tumor development. [11] The partial or complete deletion of epithelial blood group antigens due to aberrations in their synthesis brings about changes in their cell surface. It has been indicated that the altered antigen pattern on cell surface is a tumor-associated change resulting in malignancy.[12] Tobacco chewing is generally considered as the primary local etiological factor for oral cancer. Smoking and alcohol merely act as co-factors. The same was reflected in this study, wherein the frequency of the oral cancer was highest among those who had the habit of chewing tobacco. Also, in the present study, it was seen that though patients of all blood groups had tobacco chewing habit, oral cancer was seen more in patients with blood group A. A high incidence of various carcinomas are found in patients having A or B blood group which may be due to higher affinity of these antigens to some micro organisms known to develop cancer. Several reasonable mechanisms have been proposed to explain the relationship between ABO blood groups and risk of cancer such as inflammation, immunocompetency to detect malignant cells, intercellular adhesion and membrane signaling. [1, 13] The most common site for occurrence of oral cancer was buccal mucosa. This is because majority of the people have a tendency to keep the quid in buccal vestibule, which, over a period of time, causes chronic irritation to buccal mucosa ultimately resulting in cancer. [14] Other common sites involved were tongue and palate, since they are also actively involved in the process of chewing. Dabelsteen and Pindborg (1973) conducted extensive research comparing the presence of blood group A antigens in normal epithelium and oral carcinomas and concluded that in carcinomas, the blood group A substance decreases in amount or completely disappears.[8] Raghavan et al. studied the incidence of ABO blood groups in oral cancer cases in South Kanara district, India, and reported increased susceptibility of blood group A to oral cancer.[3] The results of the present study are also in full conformity with the results of Toto and Nadini (1990).[15]

V. Conclusion

This study demonstrates that people with blood group A are 3.98 times at a greater risk to develop OSMF where as with respect to oral cancer risk in blood group A was found to be 27%, followed by those with blood group AB, B and O. A randomized trial of screening for oral cancer and premalignant lesions in 192,053 subjects in Kerala showed a 20% reduction in mortality from oral cancer among the screened group compared to the controls. [16] By employing a simple blood grouping test during community field programs, we can target the people with blood group A , having tobacco chewing habits and educate them that they are more at risk to develop oral submucous fibrosis and oral cancer than people with other blood groups. But since this was a retrospective study based on hospital records, it may not be truly representative of all oral cancer cases in the community. Hence, further study with more sample size in this regard is recommended.

References

[1]. Mortazavi H et. al. ABO Blood groups in Oral cancer- A first Case control study in a defined group of Iranian patients. Asian Pac J Cancer Prev 2014;15 (3):1415-1418
[2]. Jaleel BF, Nagarajappa R. Relationship between ABO blood groups and Oral Cancer. J Dent Res 2012; 23:7-10.
[3]. Raghavan VM, Bailoor DN, Jhansirani P. Incidence of ABO Blood groups in Oral Cancer in South Kanara District. J Ind Dent Assoc 1986; 58:305-308.
[4]. Cawson RA, Odell EW (2002) Cawson's Essentials of Oral Pathology & oral Medicine. London:Churchill Livingstone, 43-55.
[5]. Chi AC et. al. Epithelial Pathology. In; Neville BW, Daman DD, Allen CM, Bonquot JE, Eds Oral and maxillofacial Pathology. St. Louis: Saunders, 2009: 362-433.
[6]. Fazeli Z, Pourhoseingholi MA, Pourhoseingholi A, Vahedi M. Mortality of Oral cancer in Iran. Asian Pac J Cancer Prev,2012;12: 2763-6.
[7]. Amagasa T. Oral premalignant lesions. Int J Clin Onc. 2011;16:1-4.
[8]. Dabelsteen E, Gao S ABO blood-group antigens in oral cancer. J Dent Res. 2005; **84**: 21-8.
[9]. Reddy LP. Blood grouping. In Textbook of Practical Physiology. Ist ed. Hyderabad, India: Paras Publishing; 2005 .p. 51-53.
[10]. Ananthanarayanan R. Immunohematology. In: Text Book of Microbiology, 3rd Ed. New Delhi: Orient Longman Limited; 1996. p. 170-1.
[11]. Dabelsten E, Gao S. ABO Blood group antigens in oral cancer. J Dent Res 2004;84:21-8.
[12]. Dabelsten E, Pindborg JJ. Loss of epithelial blood group substance in oral carcinoma. Acta Path Microbial Scand 1973; 81:435-44.
[13]. Xie J et. al, ABO blood group and incidence of skin cancer PLoS One 5, 11972.
[14]. Blomquist G, Hirsch JM, Alberius P. Association between development of lower lip cancer and tobacco habits. J Oral Maxillofac Surg 1991; 49:1044-7.
[15]. Toto PD, Nadimi H. Co-expression of cytokeratins, involucrin and blood group antigens in oral squamous cell carcinoma. Oral Surg Oral Med Oral Pathol 1990:70:75-80.
[16]. Shankaranarayanana R, Dinshaw K, Nene BM, Ramadas K, Esmy PO, Jayant K, et al. Cervical and oral cancer screening in India. J Med Screen, 2006;13 Suppl 1:S35-8.