



Research Article

ASSOCIATION BETWEEN ABO RH BLOOD GROUPS AND ORAL POTENTIALLY MALIGNANT DISORDERS

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ABSTRACTS

Background: A number of potentially malignant disorders like leukoplakia, erythroplakia, oral submucous fibrosis constitute a detectable pre-clinical phase of oral cancer. There is a high prevalence of these lesions in India, which is attributed to culture, ethnic, geographic factors, low socio-economic status and varying lifestyle factors. The genetic relation of these lesions is less studied. Blood groups play an important role in the immunogenetic system. Very few studies have been done in India to see the association between blood group and potentially malignant disorders. Hence the present study was under taken to assess the relationship between ABO Rh blood group and oral potentially malignant disorders.

Materials and methods: 154 cases with oral potentially malignant disorders diagnosed based on the WHO criteria (1980) were included in the study. Patients reporting to M.S.Ramaiah Dental and Hospital, Bangalore and Kaiwara center (a peripheral outreach center) were included in the study after obtaining an informed consent. Information regarding socio-demographic details was collected using proforma and blood group was assessed using blood group kit with Rapid slide test method. Statistical analysis was done using SPSS software 11. Descriptive statistics and chi square test were used to find the correlation.

Result: Out of 154 cases, 88(57.14%) were males and 66(42.86%) females. 84(54.5%) cases were leukoplakia, 2(1.3%) cases were erythroplakia, 53(34.4%) cases were OSMF and 15(9.7%) cases were with multiple oral potentially malignant disorders. 57(37.01%) of cases belonged to B+ve blood group followed by 37(20.43%) belonged to A+ve blood group.

Conclusion: The cases with B +ve blood group were more susceptible for the development of oral potentially malignant disorders, followed by A+ve blood group.

KEYWORDS: Oral Potentially Malignant Disorders, Leukoplakia, Erythroplakia, Oral Submucous Fibrosis, Blood Group

INTRODUCTION

Oral cancer has been affecting human race since time immemorial. It is one of the 10th most common cancers in the world. It is seen predominantly in both sexes accounting for one third of all the cancers in South East Asian countries. India has one of the highest incidences of

oral cancer in the world, with estimated incidence of 12.48 cases per 1, 00,000 population in males and 5.52 per 1,00,000 populations in females.[1] There are also a number of potentially malignant disorders which constitute a detectable pre-clinical phase of oral cancer. The most important ones are leukoplakia, erythroplakia, oral submucous fibrosis etc. In India prevalence of leukoplakia varies from 0.2 to 5.2%, erythroplakia 0.02% and OSMF varies from 0.16 to 3.2.²

Because of the potentially lethal nature of precancerous lesions, which are generally without pain or discomfort, there is high risk of malignant transformation. A malignant transformation rate in leukoplakia varies from 0.13% to 10% and for oral submucous fibrosis varies from 4.5% to 7.6% in various Indian studies.[2] This alarming increase in the prevalence of oral potentially malignant disorders in India is mainly due to the culture, ethnic, geographic factors, low socio-economic status and varying lifestyle factors.[3] But not much work has been done to find out the genetic relation of these most prevalent potentially malignant disorders of the oral cavity. Blood groups play an important role in the immunogenetic system. Very few studies have been done in India to see the association between blood group and potentially malignant disorders. Hence the present study was under taken to assess the relationship between ABO Rh blood group and oral potentially malignant disorders.

METHODOLOGY

This study was conducted in M.S.Ramaiah Dental College and Hospital, Bangalore and Kaiwara (peripheral outreach center of M.S.Ramaiah Dental College and Hospital, Bangalore) during a period of Eight months from 1st July 09 to 28th Feb 10. Ethical permission for the study was obtained from institutional ethical committee and patients gave their consent for the study. Convenient sampling technique was used for selecting study subjects. Subjects clinically diagnosed as oral potentially malignant disorders like leukoplakia, erythroplakia, oral submucous fibrosis, based on WHO guidelines for diagnosis for oral mucosal lesions [3] were included in the study group. Subjects who were not willing to give their blood sample for estimation of blood group were excluded. Training and calibration of examiner for clinical examination was done under the guidance of the professor in dept Oral Medicine and Radiology and Public Health Dentistry. Training and calibration for assessment of blood group was done under the guidance of the professor, dept of Oral Pathology. Calibration was done in order reduce intra examiner variability. It was carried out on 5 subjects for diagnosis of oral potentially malignant disorders and blood grouping. Kappa co-efficient value was 0.94.

A special proforma was designed for recording data pertaining to socio-demographic factors, clinical findings of oral mucosa and determinations of ABO Rh blood group. Patients rinsed their mouth thoroughly with water and were examined under an incandescent light source. During clinical examination the following elements were analyzed: features of the lesion, anatomical location, extension, etiological factors or related factors, dental status, alcohol, tobacco consumption etc. In addition, in those cases requiring further examination, biopsies were performed to establish a definitive diagnosis.

Estimation of blood group was done using blood group kit which contained antiserum A, antiserum B and antiserum D. Depending upon the presence of agglutination the blood group was detected.

Statistical analysis

Data obtained subjected to SPSS version 11. Descriptive statistics to summarize the data and chi square test to find associations between ABO Rh blood group and oral potentially malignant disorders.

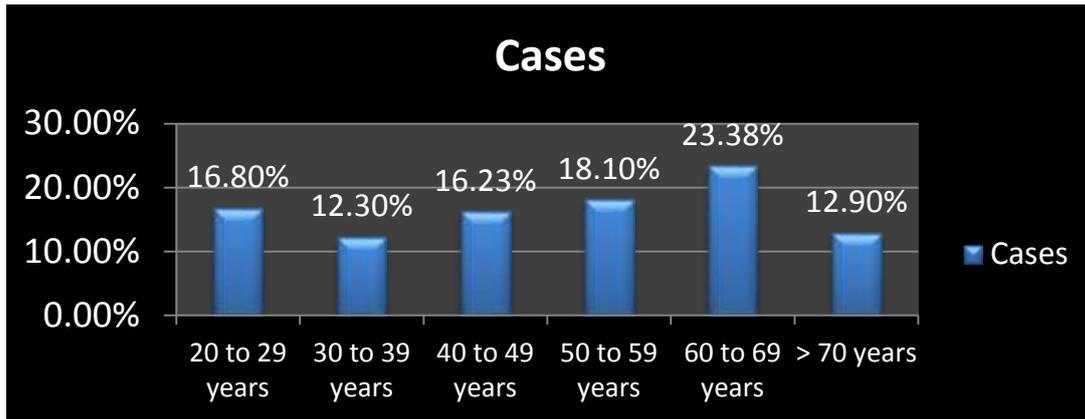
RESULTS

A total of 154 patients with oral potentially malignant disorders were recorded during the study period. Out of which 88(57.14%) were males and 66(42.86%) females (Table 1). Majority of the cases belonged to age group of 60-69 years (23.38%), mean age was 49.06 years and standard deviation was 10.7 years (Graph 1). 84(54.5%) cases were leukoplakia, 2(1.3%) cases were erythroplakia, 53(34.4%) cases were OSMF and 15 (9.7%) cases were with multiple oral potentially malignant disorders. Majority of males were having OSMF 42(47.7%) followed by 40(45.5%) leukoplakia, while in females leukoplakia 44(66.7%) was the most common followed by OSMF 11(16.7%). About 5(5.7%) cases in males and 10(15.2%) in females were having multiple oral potentially malignant disorders malignant disorders. 1 case of erythroplakia was found in both males and females (Table 1).

Table 1: Distribution of cases with oral potentially malignant disorders according to their gender

Premalignant lesions	Male No (%)	Female No (%)	Total No (%)
Leukoplakia	40(45.5%)	44(66.7%)	84(54.5%)
Erythroplakia	1(1.1%)	1(1.5%)	2(1.3%)
Oral submucous fibrosis	42(47.7%)	11(16.7%)	53(34.4%)
Multiple oral premalignant lesion	5 (5.7%)	10(15.2%)	15(9.7%)
Total	88(100%)	66(100%)	154(100%)

Graph 1: Distribution of cases with respect to their age



Estimation of blood group was done using blood group kit which contained antiserum A, antiserum B and antiserum D with Rapid slide test method. It was found that 37(20.43%) of the cases belonged to A+ve blood group and 57(37.01%) of cases belonged to B+ve blood group. About 22(14.29%) cases belonged to AB + ve group and 28(18.18%) cases belonged to O +ve blood group. Thus majority of the cases 57(37.01%) were belonging to B+ve blood group followed by 37(20.43%) belonging to A+ve blood group.

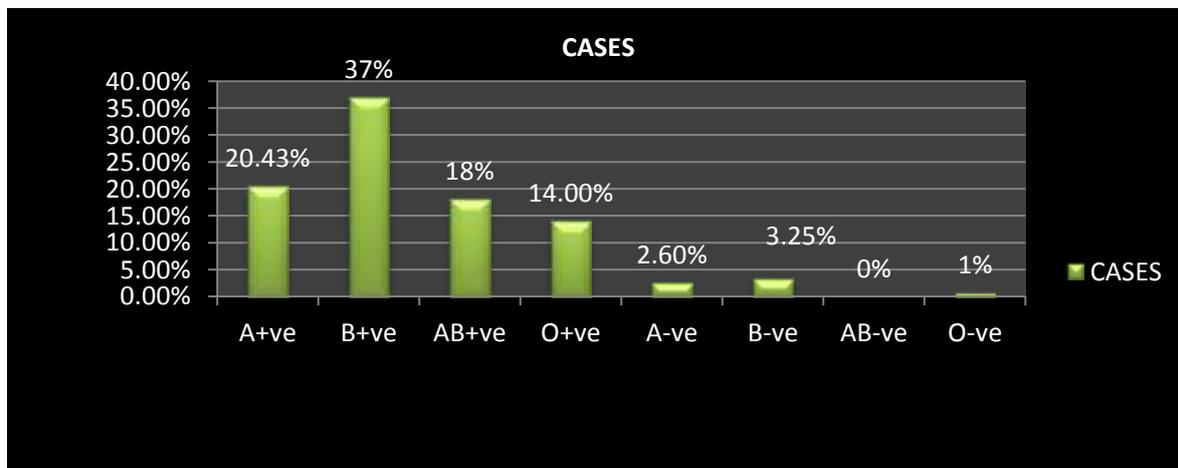
DISCUSSION

The term 'Oral potentially malignant disorders' is recommended by WHO in the year 2005.[4] It includes both oral premalignant lesions and conditions. The prevalence of oral premalignant lesions and oral cancer is very high in India. The oral premalignant lesion is an intermediate clinical state with increased risk of cancer, which can be recognized and treated with a much better prognosis compared to the full blown malignancy. Some of the major oral potentially malignant disorders are leukoplakia, erythroplakia and oral submucous fibrosis. In the present study oral leukoplakia, erythroplakia and oral submucous fibrosis were included as cases. In cases where

more than one lesion or at least two different premalignant lesions under study are present in the oral cavity than it is considered as multiple oral premalignant lesions. The present study was conducted in M S Ramaiah Dental College, Bangalore and Kaiwara because during the regular field programs conducted in and around these areas it was observed that prevalence of OPMDs was high.

Majority of the cases belonged to age group of 60-70 years (Table 2 and Graph 2). This shows that OPMLs are more common in older individuals. In a study done by Christian Scheifele et al showed a peak age of 40-49 years in males and ≥ 70 in females for occurrence of oral leukoplakia.[5] these findings were similar with our study. The OPMLs and oral cancer are considered to be the disease of older age. Majority of males were having OSMF followed by leukoplakia, while in females leukoplakia was the most common followed by OSMF. This dramatic increase in oral submucous fibrosis has been attributed to various etiological factors of which gutka and paan masala chewing are predominantly very common.[6] Thus identifying these lesions at an early stage and rendering treatment is very important for decreasing the mortality rate due to their malignant transformation.

Graph 2: Distribution of cases with respect to their blood group



In our day to day practice we observe subjects with a prolonged exposure to potential risk factors, however not all of them develop premalignant lesions. This implies that some other factor present in them is responsible for their

inborn resistance against these premalignant lesions. Many hypotheses have been put forth for the etiopathogenesis of these premalignant lesions, but the role of genetics has been less studied. The blood groups play a significant role

in immunogenetic system and their association with various other malignancies has been studied.[7] In the present study distribution of potentially malignant disorders was more among B positive blood group (37%) followed by A positive blood group (20.4%), but the distribution was less among O positive blood group (18.18%). There was no statistically significant association between ABO Rh blood groups and oral potentially malignant disorders ($p=0.228$), this could be due to smaller sample size. In a similar study done by Vaish et al blood group A was associated with leukoplakia and oral submucous fibrosis.[8] Raghavan VMR et al studied the incidence of ABO blood group in oral cancer cases in south Kanara district, India and reported increased susceptibility of blood group A to oral cancer.[10] In a study by E Dabeistein et al reported a higher incidence of various type carcinomas in blood group A and B individuals.[11] As per our literature search many studies did not incorporate the Rh factor in association with blood group and OPMD. This could be the first reported study incorporating the association of Rh factor with oral potentially malignant disorders.

The above studies and as indicated in our study, certain blood group are considered more prone to develop pre-malignancy and subsequently convert to malignancy. This is explained by the fact that blood group antigen 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 biosynthesis of A and B antigen is seen in association with tumor development.[12] H antigen is precursor for the formation of A and B antigen and is present in all the individuals irrespective of blood group types. H antigen is converted in to A and B antigens in people belonging to A and B blood group. Where as in O blood group individuals H antigen remains in its original form. People with O blood group have highest amount of H antigen which affords protection, hence least susceptible to develop oral cancer.[13]

CONCLUSIONS

The results of the present study showed that cases with B +ve blood group were more susceptible for the development of oral potentially malignant disorders, followed by A+ve blood group. But as for our literature search many studies did not incorporate the Rh factor in association with blood group and OPMD. This could be the first reported study incorporating the association of Rh factor with oral potentially malignant disorders.

In the present study which has included Rh factor, so the biological plausibility of such an association should be investigated in further studies with larger sample size.

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