ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)

IJDSIR : Dental Publication Service

Available Online at: www.ijdsir.com

Volume – 3, Issue – 4, July - 2020, Page No. : 94 - 100

Association of ABO Blood Grouping With Apthous Stomatitis - A Cross-Sectional Study

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Citation of this Article: Dr. Vaibhav Chaudhari, Dr. Sneha Singh, Dr. Saurabh Rathi, Dr. Ovais Khan, "Association of ABO Blood Grouping With Apthous Stomatitis - A Cross-Sectional Study", IJDSIR- July - 2020, Vol. – 3, Issue -4, P. No. 94 – 100.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Objective: To find the association between apthous stomatitis and blood group amongst the patients visiting OPD of a private dental hospital.

Methodology: The present cross sectional study included 150 participants attending OPD. A questionnaire was distributed among the participants and after filling the questionnaire the participants had to undergo a routine oral examination followed by blood grouping and Rh examination. Data was analysed using SPSS version 16.0.

Results: Out of 150 participants, 52 (34.63%) were males and 98 (65.4%) were females amongst them, 38 (25.53%) patients were with blood group A, 57 (37.9%) with blood group B, 30(19.93%) with AB blood group and 25(16.64%) with O blood group respectively. The result stated that participants having blood group as B+ had maximum occurrence of apthous stomatitis when compared with other blood groups.

Conclusion: The study reflects that apthous stomatitis most commonly affects people with B+ blood group.

Keywords: ABO system, apthous stomatitis, blood group, cross sectional study, Rh factor

Introduction

Apthous Stomatitis is one of the most common inflammatory condition for which the patient reports to the dental clinic. It is derived from the Greek word "apthae" which means ulceration.[1] In recurrent aphthous stomatitis round or ovoid painful ulcers appears on the oral mucosa which is characterized by repeated formation of benign and non-contagious mouth ulcers in otherwise

healthy individuals. Both systemic and local factors have been attributed to its etiology, which include trauma, tobacco, drugs, haematinic deficiency, hormonal changes and stress.[2] Patient may present first in childhood or adolescence, with one or multiple ulcers which are round to oval in shape with circumscribed margins, covered by a yellowish or gray-white fibrinous exudates and surrounded by an erythematous halo with necrotic centre.[3] Prodromal burning sensation occurs 24 to 48 hours prior to onset of Oral Ulcers. Apthous Stomatitis is classified under 3 types- Minor, Major and Herpetiform type.[4] Most common amongst them is aphthous stomatitis minor with diameter not more than 1 cm and healing within 10-14 days without scarring.[5] Aphthous Major are larger than 1 cm and usually heals with scarring. Herpetiform Ulcers manifest as clusters of small ulcers scattered all over the oral mucosa, measuring 2-3 mm and as many as 100 ulcers can develop simultaneously.[6] Worldwide oral ulcers are present in approximately 4% of the population and ranges from 5-20%.[7]

Karl landsteiener, classified the blood groups depending on whether their RBC cell membrane contained agglutinogen (antigens) "A", agglutinogen "B " neither A nor B (group 0) or both A and B (group AB).[8] On the basis of different blood group antigens, there are many blood group systems among them only ABO and Rhesus system are important in clinical practice.[9] Although whole population share same blood system, their distribution shows marked variation around the world. Variations also occur between different countries, and different areas of same country.[10] Different blood groups are the most investigated for erythrocyte antigen system, and owing to ease of identifying their phenotypes, they have been used as genetic marker in studies of their association with various diseases.[11] Blood group A individuals have been reported to be more prone to gall stones, colitis and tumors of salivary glands.[12] Although several studies have been carried out related to ABO Blood group and various systemic diseases, little investigations has been made to explore relationship between ABO blood group and Rh factor to dental and oral diseases.[13]

Although aphthous stomatitis is one of the most common pathology of oral cavity, the etiopathogenesis remains unclear, because of its non preventable nature. [14] While considering its etiology, genetics play an important role and thus the focus of determining the disease susceptibility changed to genetics. [15] Thus the present study was carried to find the association of ABO blood grouping with aphthous stomatitis.

Materials and Methods

The present cross sectional study was conducted in Department of Oral Medicine and radiology and in Department of General Medicine in a private hospital in Central India over the time period of 4 months from October 2019 to January 2020. The study sample included 150 patients. Ethical clearance from institutional ethical committee was obtained.

Inclusion Criteria:

A] Subjects who gave informed consent

B] Subject who had no history of systemic illness such as Diabetes Mellitus etc.

C] No history of smoke or smokeless form of tobacco consumption.

D] Subjects suspected with malignant ulcers based on clinical examination.

Exclusion Criteria:

A] Subjects who did not give informed consent

B] Subject who had history of systemic illness such as Diabetes Mellitus etc.

B] History of smoke or smokeless form of tobacco consumption.

Patients were informed about the method and purpose of the study. A written informed consent was then obtained from the patients. A questionnaire was given to the subjects which consisted of their demographic details and the frequency and healing period of ulcers which occurred.

Following which the examination was conducted using the WHO guidelines under artificial illumination , with the help of a mouth mirror for the diagnosis of recurrent aphthous stomatitis based on criteria proposed by Natah et al in 2004.[6] All the patients were examined by a single dentist who was trained and calibrated prior to the start of the study. The examination of labial mucosa, buccal mucosa, dorsal/ventral/lateral margins of tongue and floor of mouth was carried out. The aphthous stomatitis included minor, major and herpetiform types which are characterized by recurrence. The blood group of the subjects was then asked and the subjects who did not know their blood groups were examined for the same. Blood grouping and Rh examination was done using slide method by a finger prick using disposable needle under all sterile and aseptic conditions. Data was analyzed using Statistical Package for the Social Sciences version 16.0 manufactured by IBM Corporation –Armonk, New York, US. All the collected data was entered in the Microsoft Office Excel Sheet 2007 version. Descriptive analysis and chi-square test was used. The level of significance was decided at <0.05.

Result

A total of 150 participants were included in the study, among whom maximum 57 (37.9%) were having blood group as B, while least 25 (16.64%) were having blood group as O. Females were in the majority 98 (65.4%) ,while the remaining were males 52 (34.63%). (Table 1)

Table 1: Demographic Details

Blood Groups	Male N (%)	Female N (%)	Total N (%)
A	14(9.33%)	24(16.2%)	38(25.53)
B	23(15.33%)	34(22.6%)	57(37.9)
AB	10(6.63%)	20(13.3%)	30(19.93)
O	5(3.34%)	20(13.3%)	25(16.64)
	52(34.63)	98(65.4)	150(100)

Out of 150participants,it was observed that patients with blood group A had highest frequency of ulcer with occurrence twice a week (36.8%), blood group B with once a month(45.6%), blood group AB with twice a week(40%), and blood group O with highest frequency of once a month(40%).When Rh factor was compared with frequency of oral ulcers it was seen that Rh positive subjects had highest frequency of once a month (38.2%), followed by twice a month (28.6%) and once a week(27.2%). whereas, subjects with Rh negative factor shows highest frequency of twice a month (42.8%) followed by once a week(28.5%) and once a month(28.5%).(Table 2)

Table 2: Association of blood group & Rh factor with frequency of Ulcer

Blood Group	Total N (%)	Frequency of Ulcer				X^2 Value	P-Value
		Once A Week N (%)	Twice A Week N (%)	Once A Month N (%)	More Than That N (%)		
A	38(100)	10(26.3)	14(36.8)	10(26.3)	4(10.6)	9.311	0.40
B	57(100)	16(28)	13(22.8)	26(45.6)	2(3)		
AB	30(100)	8(26.6)	12(40)	10(33.3)	0(0)		
O	25(100)	6(24)	7(28)	10(40)	2(8)		
Total	150 (100)	40(26.6)	46(30.6)	56(37.3)	8(5.3)		
Rh positive	136(100)	37(27.2)	39(28.6)	52(38.2)	8(5.8)	2.001	0.57
Rh negative	14(100)	4(28.5)	6(42.8)	4(28.5)	0(0)		
Total	150	41(27.3)	45(30)	56(37.3)	8(5.3)		

Statistical test: Chi-Square; ($p<0.05$ significant, CI=95%), N= number of study subjects

It was observed that maximum of patients reported healing of their aphthous ulcer within 7 days 78(52%), 55(36.6%) reported healing within 7-14 days, 13(8.6%) reported healing within 14-21 days and 4(2%) reported healing more than 21 days. It also shows relation of Rh factor with healing period of ulcer. When comparison was done among all four blood groups with their healing period of ulcer it showed statistically significant difference ($p=0.07$). Comparison of Rh factor along with healing period of ulcer also showed statistically significant difference ($p=0.01$). (Table 3)

Table 3: Association of Blood group & Rh factor with Healing period of Ulcer

Blood Group	Total N (%)	Healing Period				X^2 Value	P-Value
		7Days N (%)	7-14 Days N (%)	14-21 Days N (%)	>21 Days N (%)		
A	38(100)	20(52.6)	16(42.1)	0(0)	2(5.26)	15.8	0.07*
B	57(100)	27(47.3)	18(31.5)	10(17.5)	2(3.50)		
AB	30(100)	18(60)	9(30)	3(10)	0(0)		
O	25(100)	13(52)	12(48)	0(0)	0(0)		
Total	150(100)	78(52)	55(36.6)	13(8.6)	4(2)		
Rh positive	136(100)	74(54.4)	49(36)	49(36)	2(1.4)	10.1	0.01*
Rh negative	14(100)	4(28.5)	6(42.8)	2(14.2)	2(14.2)		
Total	150	78(52)	55(36.6)	13(8.6)	4(2.6)		

Statistical test: Chi-Square; (p<0.05 significant, CI=95%), N= number of study subjects

It was observed that patients with all the Blood Group A, B, AB and O shows episode of single ulcer each with frequency of 18 (47.3%), 33(57.8%), 17(56.6%) and 17(68%) respectively. It also observed that 77(56.6%) of subjects with both Rh positive and 8(57.1%) of subjects with Rh negative had single ulcer per episode whereas 48(35.2%) subjects with Rh positive and 2(14%) with negative had 2-4 ulcers each episode. 4(28.5%) of subjects with Rh negative show 6-10 ulcers each episode compared to 11(8%) of subjects with Rh positive factor. None of the case reported more than 10 ulcers. When comparison was done among all four blood groups with the number of ulcer it showed statistically significant difference (p=0.01). Comparison of Rh factor along with number of ulcer also showed statistically significant difference (p=0.03).(Table 4)

Table 4:Association of Blood group & Rh factor with Number of Ulcers

Blood Group	Total N (%)	Number of Ulcer				X^2 Value	p-value
		Single N (%)	2-4 N (%)	6-10 N (%)	>10 N (%)		
A	38(100)	18(47.3)	16(42.1)	4(10.5%)	0(0%)	15.285	0.01*
B	57(100)	33(57.8)	13(22.8)	11(19.2%)	0(0%)		
AB	30(100)	17(56.6)	13(43.3)	0(0%)	0(0%)		
O	25(100)	17(68)	8(32%)	0(0%)	0(0%)		
Total	150(100)	85(56.6)	50(33.3%)	15(10%)	0(0%)		
Rh positive	136(100)	77(56.6)	48(35.2%)	11(8%)	0(0%)	7.007	0.03*
Rh negative	14(100)	8(57.1%)	2(14%)	4(28.5%)	0(0%)		
Total	150	85(56.6%)	50(33.3%)	15(10%)	0(0%)		

Statistical test: Chi-Square; (p<0.05 significant, CI=95%), N= number of study subjects

Discussion

Aphthous stomatitis is one of the most common inflammatory disease of the oral cavity and it causes a lot of agony and suffering for the patients throughout their life.[3] It is estimated that a variety of factors such as age, sex, diet, socioeconomic status affects the occurrence of apthous stomatitis. The previous literature aimed to focus the relation of blood group with apthous stomatitis, but no conclusion could be drawn. However, the comparison between Rh factor and apthous is first of its kind.

In the previous study conducted by Narang D et al, apthous ulcers were found more prevalent in blood group O(26.5%)[1], Ufuk kavuzula reported blood group A(40%) more prevalent(22), whereas in our study blood group B(38%) is the most common group associated with recurrent aphthous stomatitis. Our study contrasted the

previous studies and this difference might be attributed to ethnic and racial differences, immigration, and different sample size. It was observed that females i.e. 98(65.4%) were more frequently affected than males i.e.52 (34.63%)and the results were similar when compared to findings of Santosh et al[3](56.3% females and 43.7% males) and Rajmane YR[21] (62.5% females and 37.5% males). This might be attributed to more stress and hormonal changes in females as compared to male. No statistical significant association was found between relation of blood group to frequency of occurrence whereas significant association was seen related to number of ulcer and their healing period. It was observed that maximum patients reported with single ulcer in each episode 85(56.6%) . This finding was in accord with the studies done by Zuzanna Slebioda[7], Fahimeh Rezazadeh[20] as majority of patients suffers from recurrent aphthous minor. Both Rh positive and Rh negative individuals reported with single ulcer each episode, that is aphthous minor. Also blood group B had more number of ulcers (6-10) when compared to blood group A and group AB (2-4). Similarly Rh negative individuals showed more number of ulcers when compared to Rh positive; significant association was seen between healing period, and Rh factor with Rh positive healing showing within 7 days, and Rh negative within 7-14 days which presents that people with Rh negative shows delayed healing when compared to Rh positive.

A limitation of this study is that it was conducted only for a duration of 4 months, long term value of improvement need to be confirmed by further longitudinal studies with an increase in sample size. Inequality in gender was observed. Little information relied on patient's history which might have led to variations in results and was carried out in a small area which makes it difficult to establish generalizability. Hence, it is recommended that more genetic and molecular level studies should be carried out regarding apthous stomatitis in association with blood group and Rh factor for a longer duration of time as these things might leave a better impact on the literature.

Conclusion

Recurrent apthous stomatitis is one of the most common disease affecting oral cavity with multifactorial etiology. Different blood groups and Rh factor may constitute a risk factor on the development of aphthous stomatitis. The present study showed that subjects with B+ blood group are more prone to having apthous stomatitis and they also showed a better tendency of healing when compared to others.

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