

Tongue Lesions in Pakistani population, Subjective Awareness and Association with Blood Groups

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ABSTRACT

Objective: To determine the frequency of various tongue lesions diagnosed during dental examination in a Pakistani population and to assess their association with blood groups.

Study Design: Cross-sectional study.

Place and Duration of the Study: Outpatient Department, Dental College Hospital of Heavy Industries Taxila Educational City Institute of Medical Sciences and Dental OPD, Heavy Industries Taxila Hospital, Taxila Pakistan, from Oct 2022 to Sep 2023.

Methodology: The study included five hundred patients. It excluded pregnant women and participants with a diagnosed malignant condition. Those who gave consent were examined for the absence or presence of tongue lesions like Aphthous ulcer, Fissured tongue, coated tongue, geographic tongue and median rhomboid glossitis on the basis history and clinical presentation.

Results: The study included five hundred patients. It was discovered that 19(3.80%) of the participants had aphthous ulcers, 17(3.40%) of the participants had fissured tongues, 24(4.80%) had geographic tongue, 146(29.20%) had coated tongue, and 19(3.80) had median rhomboid glossitis. Aphthous ulcers were more common in the O+ blood group, the A+ blood group had more cases of Fissure tongue, the O+ blood group had more cases of Coated tongue, and the O- blood group had more cases of Geographic tongue.

Conclusion: Different tongue lesions had varying frequency in our population, with coated tongue being the most prevalent. However, there were no statistically significant differences in the distribution of tongue lesions among various blood groups.

Keywords: ABO blood groups, coated tongue, tongue lesions.

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INTRODUCTION

As a remarkable muscular organ, the tongue performs various tasks crucial for human life and communication.¹ The tongue primarily comprises skeletal muscle but also contains blood vessels, nerves, fat cells, minor salivary glands, and lymphoid tissues. These various components can lead to the development of both neoplastic (related to tumour growth) and non-neoplastic lesions.² Because the tongue is readily accessible in the oral cavity, examining it can provide valuable diagnostic insights.³ This is because both local and systemic diseases or syndromes may manifest in the tongue, making it an important area for assessment in medical diagnosis.⁴

The cell membrane not only acts as a physical barrier but also performs some specific functions. One such function is its ability to interact with other cells and the intracellular matrix. This interaction is

essential for various cellular processes such as cell signalling, adhesion, and communication.^{5,6} Carbohydrates on the cell membrane can change their structure in diseases. Alterations in glycolipids and glycoprotein and the loss of A, B, and H antigens from red blood cells impact cell recognition, immune response and disease progression.^{7,8}

There is substantial evidence suggesting associations between certain systemic diseases and ABO blood groups. A previous study found that individuals with blood group AB have 1.82 times higher odds (OR=1.82) of experiencing cognitive impairment compared to individuals with other blood types. Associations between ABO blood groups and various diseases, including circulatory diseases and certain types of cancers, have been established in scientific literature.⁹ However, the relationship between the ABO blood group and tongue lesions has not been investigated in connection with a particular geographic region.¹⁰ This study aimed to determine the frequency of different types of tongue lesions detectable during routine dental check-ups among a

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sample of the Pakistani population and to explore any potential associations with blood groups. This was conducted on a group of Taxila City of Rawalpindi district patients. The research findings can enable us to prevent and diagnose a particular tongue lesion, manage the underlying disease early, and see how prevalent a tongue lesion is in a particular blood group so that preventive strategies can be taken.

METHODOLOGY

The cross-sectional study was conducted at the OPD, Dental College of HITEC-IMS and the Dental OPD, HIT Hospital Taxila Cantt, Pakistan from October 2022 to September 2023, after approval from the Institutional Research Board and Ethics Committee (Ref: Dental/HITEC/IRB/36). The sample size was calculated using the formula for cross-sectional studies, taking the frequency of tongue lesions at 26.8%.¹¹

Inclusion Criteria: Patients of either gender visiting the OPD of the Dental Centre and OPD of the dental college were included.

Exclusion Criteria: Pregnant females and diagnosed patients of any malignant disease were excluded.

The study included five hundred patients. Informed consent was taken from all the participants; those who were not willing to participate in the study were omitted, and those who gave consent were examined for the absence or presence of tongue lesions like Aphthous ulcer, Fissured tongue, Coated tongue, Geographic tongue and Median Rhomboid Glossitis on the basis history and clinical presentation.

The data was recorded, and the patient was advised to have a blood group test from HIT hospital's laboratory. The laboratory results were also recorded. Data was analyzed using the Statistical Package for the Social Sciences Version 27. Results were drawn as percentages and frequencies. The chi-square test was applied to find the association.

RESULTS

In our study, 500 participants were included, out of which 216(43.20%) were females and 284(56.80%) were males. The mean age of the participants was 53.73±16.11. Table-I indicates that 225(45.00%) patients had tongue lesions. Out of the total females, 101(46.75%) had tongue lesions, while out of the total males, 124(43.64 %) had tongue lesions. Coated tongue was the most common tongue lesion present in 146(29.20%) patients.

A comparison of blood groups with various tongue lesions indicated that the difference is not statistically significant for any of the tongue lesions, but it was found that most patients.

(9.09%) With aphthous ulcers in the O+ blood group, most patients with coated tongues had A+ (36.4%) and O+ (36%) blood groups. Similarly, most of the patients (8%) with geographic tongue had O- blood groups; again, for fissured tongue and median rhomboid glossitis, most of the patients (4.7%) and (6.5%), respectively, had A+ blood groups.

Table-I Frequencies of various types of Tongue Lesions, their Gender wise distribution and their Awareness among Patients (n=500)

Type of Tongue Lesions	Tongue lesions present in of total no of patients n(%)	Tongue lesions present in females n(%)	Tongue lesions present in males n (%)	Patients aware about their lesions n (%)
Aphthous Ulcer	19(3.80)	9(4.16)	10(3.52)	2(10.52)
Fissured Tongue	17(3.40)	10(4.63)	7(2.46)	2(11.76)
Coated Tongue	146 (29.20)	65(30.09)	81(28.52)	18 (12.32)
Geographic Tongue	24(4.80)	10(4.63)	14(4.92)	1(4.16)
Median Rhomboid Glossitis	19(3.80)	7(3.24)	12(4.22)	1(5.26)
Total	225(45.00)	101(46.75)	124(43.64)	24(10.66)

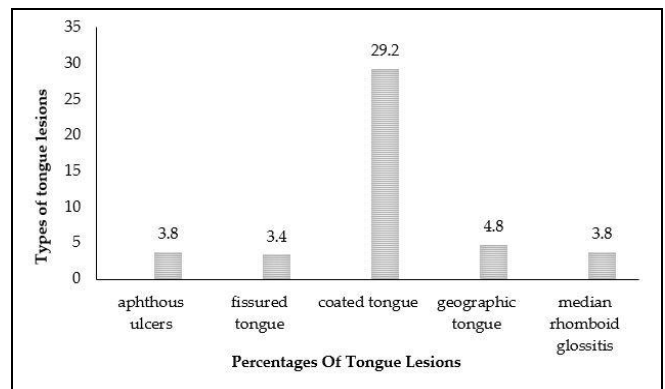


Figure: Frequency of different tongue lesions (n=500)

Based on the results presented in Table II, we have determined that there is no statistically significant variation in the distribution of tongue lesions among the various blood group categories. The only relationship that reaches some level of statistical significance is the one between the blood group and

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Table-II: Association Between Blood Groups and Various Tongue Lesions (n=500)

		Aphthous Ulcers		Total	p value
		Present (%)	Absent (%)		
Blood Groups	A	1(3.57)	27(96.43)	28(5.60)	0.24
	A+	3(2.80)	104(97.20)	107(21.40)	
	AB	0(0)	55(100)	55(11)	
	AB+	6(7.69)	72(92.31)	78(15.6)	
	B	1(2.17)	45(97.83)	46(9.20)	
	B+	4(2.87)	135(97.13)	139(27.8)	
	O	2(8)	23(92)	25(5)	
	O+	2(9.09)	20(90.91)	22(4.40)	
Total		19	481	500	
		Fissure tongue		Total	p value
		Present (%)	Absent (%)		
Blood Groups	A	0(0)	28(100)	28(5.60)	0.91
	A+	5(4.67)	102(95.33)	107(21.40)	
	AB	2(3.64)	53(96.36)	55(11)	
	AB+	3(3.84)	75(96.16)	78(15.6)	
	B	1(2.17)	45(97.83)	46(9.20)	
	B+	5(3.59)	134(96.41)	139(27.8)	
	O	0(0)	25(100)	25(5)	
	O+	1(4.54)	21(95.46)	22(4.4)	
Total		17	483	500	
		Coated tongue		Total	p value
		Present (%)	Absent (%)		
Blood Groups	A	6(21.43)	22(78.57)	28(5.60)	0.07
	A+	39(36.44)	68(63.56)	107(21.40)	
	AB	17(30.90)	38(69.10)	55(11)	
	AB+	20(25.64)	58(74.36)	78(15.60)	
	B	12(26.08)	34(73.92)	46(9.20)	
	B+	38(27.34)	101(72.66)	139(27.80)	
	O	6 (24)	19(76)	25(5)	
	O+	8(36.34)	14(63.66)	22(4.40)	
Total		146	354	500	
		Geographic tongue		Total	p value
		Present (%)	Absent (%)		
Blood Groups	A	0(0)	28(100)	28(5.60)	0.61
	A+	6(5.60)	101(94.40)	107(21.4)	
	AB	2(3.63)	53(96.37)	55(11)	
	AB+	2(2.56)	76(97.44)	78(15.60)	
	B	2(4.35)	44(95.65)	46(9.20)	
	B+	10(7.19)	129(92.81)	139(27.80)	
	O	2(8)	23(92)	25(5)	
	O+	0(0)	22(100)	22(4.40)	
Total		24	481	500	
		Median rhomboid glossitis		Total	p value
		Present (%)	Absent (%)		
Blood Groups	A	1(3.57)	27(96.43)	28(5.60)	0.59
	A+	7(6.54)	100(93.46)	107(21.4)	
	AB	1(1.82)	54(98.18)	55(11)	
	AB+	4(5.12)	74(94.88)	78(15.60)	
	B	2(4.34)	44(95.66)	46(9.20)	
	B+	3(2.16)	136(97.84)	139(27.80)	
	O	1(4)	24(96)	25(5)	
	O+	0(0)	22(100)	22(4.40)	
Total		19	481	500	

the Coated tongue, which has a *p*-value of 0.07. Our results also indicate that tongue lesions were more

prevalent in our population in the A and O blood groups, though statistically insignificant. This finding

can be used as a valuable preventive measure. The frequency of various types of tongue lesions is shown in Figure.

DISCUSSION

Tongue lesions can arise from local diseases, including bacterial or viral infections, systemic conditions such as metabolic or immunologic disorders, adverse reactions to medications, or lifestyle behaviours such as tobacco, betel nut, or alcohol consumption.^{11,12} The study's gender distribution indicated a higher frequency of tongue lesions among females (47%) than males (44%). This conflicts with Patil et al. study which, which showed that more males have tongue lesions than females.¹³

This study indicates coated tongue as one of the most prevalent lesions on the tongue (29.2%), followed by the geographic tongue (3.8%) and recurrent aphthous ulcers (4%), median rhomboid glossitis (3.8%) and Fissured tongue (3.4%). A higher frequency of coated tongue is also reported in India, at 28%.⁹

Though the formation of tongue lesions is a common phenomenon, not only in subjects suffering from diseases but also in healthy individuals, these lesions play a significant role in diagnosing systemic conditions and disorders because they often manifest visibly on the tongue, providing valuable clues for healthcare professionals. Despite considerable discussion surrounding the connection between tongue lesions and various disorders, such as autoimmune diseases, nutritional deficiencies, or infections, the precise nature of these relationships remains unclear. Researchers continue to investigate the underlying mechanisms and potential diagnostic implications of tongue lesions in order to better understand their role in disease processes.¹⁴

The existing literature on the relationship between tongue lesions and ABO blood group types is relatively sparse. While numerous studies have explored the connection between blood group types and various health conditions, including certain diseases¹⁵ and susceptibility to certain infections,¹⁶ the specific association with tongue lesions has received less attention. An important finding of our study was that although we could not find any statistically significant association between tongue lesions and blood groups, most patients with coated tongue were found to have A+ (36.4%) and O+ (36%) blood groups. Similarly, most of the patients (8%) with geographic tongue had O-blood groups; again, for fissured tongue and median rhomboid glossitis, most of the patients

had A+ blood groups (4.7%) and (6.5%), respectively. This is comparable to earlier studies done in other parts of the world, as in Saudia Arabia 2019, most patients with fissured tongues and geographic tongues had O+ and O- blood groups.¹⁷ contrast to our study, the Saudi Arabian research explicitly focused on the fissured tongue and geographic tongue lesions, or a combination of both, while our investigation has included a broader range of tongue lesions; in our study, aphthous ulcers were more prevalent in patients having O+ blood groups. This is in accordance with a study by Al Qahtani *et al.*, who reported a statistically significant association of O+ and O- Blood groups with tongue lesions.¹⁷ This is also comparable to a study conducted in Turkey in 2018, where aphthous ulcers were more prevalent in A+ and O+ patients.¹⁸

Most patients were asymptomatic and reported to the outpatient department with other dental problems. Only 10.66% of the patients were aware of their lesions.

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CONCLUSION

To conclude, our study offers valuable insights into the epidemiological characteristics of tongue lesions, which could serve as a foundation for designing future oral health studies in Pakistan. While our analysis did not reveal a statistically significant relationship between blood groups and the occurrence of tongue lesions, we did observe certain lesions to be more prevalent among specific blood groups.

The observation that certain tongue lesions are more prevalent among specific blood groups underscores the importance of further investigation. Future research endeavours can reveal the underlying mechanisms and pathways that contribute to these associations.

Conflict of Interest: None.

Authors Contribution

Following authors have made substantial contributions to the manuscript as under:

AG & NZ: Data acquisition, critical review, approval of the final version to be published.

RS & RY: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

MNN & FH: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of

any part of the work are appropriately investigated and resolved.

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