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A Comparative Study Between Rugoscopy Pattern And Blood Group Of The Individual

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INTRODUCTION:
Rugos refers to the examination and study of palatal rugae which are the irregular fold like structures located on the hard palate of the oral cavity. like fingerprints , pattern present in the rugae is also unique and it doesn't change once the individual has reached maturity and completed their growth. Rugae patterns have been useful in aiding of identifying an individual remind and is useful in many aspects of forensic odentology.

Rugoscopic examination is now completed by taking a picture or a cast of the palatal rugae and analyzing their length, shape and arrangement. Modern computing tools allow the analysis and comparison of these unique patterns assigned to the rugae, enabling smoother matching enabling smoother classification and precise identification. It requires mentioning that even if rugoscopy has made strides as a forensic tool, the field is still in rudimentary development which slows its enhance it on a wider scale. Other domains are required to develop trust and withstand stringent controls. In other words, further research is required.Nonetheless, it should be mentioned that although rugoscopy has potential in forensic science, it is not practiced frequently. ``More work`` needs to be done in confirming its dependability, precision, and functionality in a wide range of forensic domains. ```The blood group``` or blood types classify human blood into four main groups A, B, AB and O. This classification is based on a particular antigen located on the membrane of red blood cells.Similar to this ABO system of classification of blood group , it can also be classified based on another specific antigen called Rh antigen . On this current era education on one's blood type is crucial particularly in emergencies like oral transplant or blood transfusion . It is vital to match blood group between the donor and the recipient or it can lead to incompatible transfusion.

Several studies have been conducted in the past to explore patterns in distribution, gender differences, and variations based on ethnicity or geography. These research areas are
important in departments such as anatomy, forensic odontology, orthodontics, and prosthodontics.Studies related to lip prints, rugoscopy patterns , finger prints, bite marks correlating with gender in different populations.In this research we are going to know about the correlation between the Rugoscopy patterns of the individual and the blood group. This research would be useful in the field of forensic odontology and can be helping in identification

MATERIALS AND METHODS
338 participants were recruited for this research with the consent of the individual and the ethical approval from department of pediatric dentistry and research departments of Saveetha dental college and was recorded in the pro forma. Rugae patterns of these participants were obtained by first taking their alginate impression and by pouring the casts and the rugae patterns were evaluated and simultaneously blood group of the individual were evaluated.After the evaluation and the values were noted down the collected data was loaded is the SPSS software for the results.

RESULTS:
On comparing the number of rugae on the right and left side of the arch, on the left rugae majority of the participants had 5 rugae with frequency of 130 and percentage of 21.7% and on the right rugae majority of the participant had 5 rugae with frequency of 130 and percentage of 21.7% (table. 1). In comparison of the length of the rugae majority of the patients had primary length of rugae with frequency of 595 and percentage of 99.2 (table .2). On comparison of the shape of the rugae majority of the participants had wavy shape of rugae with frequency of 300 and percentage of 50.0%. (table 3) . On comparing the direction of the rugae majority of the participants had forward direction type of rugae that of frequency 480 and percentage of 80.0% (table 4). When comparing the unification type of rugae present most of the participants had absence of unification with frequency of 236 and percentage of 39.9% followed by divergence type of unification with frequency of 234 and percentage of 39.0

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DISCUSSION:

. In the past, several studies have focused on pattern distribution, gender differences, and ethnic or geographical variations, with research spanning across fields such as anthropology, anatomy, forensic odontology, orthodontics, and prosthodontics. Additionally, studies on lip prints, rugoscopy patterns, fingerprints, and bite marks have been used to investigate correlations with gender across various populations.

In this study when comparing the no of rugae present in the left and right side of the palate, most of the participants that is around 132 participants had 3 rugae on the left aspect of the palate followed by 5 rugae on the right aspect of frequency 130 followed by 127 participants with 4 rugae and 118 participants with 7 rugae and 112 Participants with 6 rugae. In comparison the no of rugae on the right aspect of the palate the AB blood group had more number of participants with 3 rugae and both A and B blood group had the most equal number of 4 rugae present on the eighth palatal aspect. O blood group had the most participants with 5 rugae present and A blood had most participants with 6 rugae and O positive blood group had most people with 7 palatal rugae on the right aspect.

On comparison of the distance of the palatal rugae with correlation of the blood grouping system all the blood group including A,B,O,AB majority of the participants had primary type of rugae and secondary and fragment was least found.Regarding shape, the wavy pattern was more common in females, while the curved pattern was more prevalent in males. Other patterns observed included straight, divergent, convergent, and circular, with the circular pattern being more frequent in males than females.
On comparison of the shape of the rugae with correlation pattern with blood group the AB blood group had most number of circular shaped rugae and O blood group had the most number of participants with curved shaped palatal rugae followed by A group and AB group had most participants with straight type of palatal shaped rugae followed by B group and O group and A group and B blood group both have equal number of most patients with wavy type of rugae shape and the p value is greater than 0.05 hence it is insignificant and a similar study done by Deeksha Kiran Shetty.Etal showed Results

On comparison of the direction of the palatal rugae with correlation of the blood group blood group A had the most number of participants with backward directed palatal rugae followed by AB group, O group and B group and when correlation with forwardly directed palatal rugae B blood group had most participants with forwardly directed palatal rugae and on comparison with forward and backward most of the participants had forwardly directed palatal rugae. A similar study done by Puranik srikala Etal showed that In males, all blood groups showed a predominant wavy rugae shape, except for O+ which had a major straight rugae shape. In females, the wavy rugae shape was most common in groups A, B, AB, and AB-negative, while the straight rugae shape was more prevalent in blood groups O and O-negative. The secretor status was 96% in females and 94% in males, with blood group AB showing a 100% secretor status in both genders.

CONCLUSION

This study reinforces the importance of palatal rugae, highlighting their correlation with blood groups. The findings indicate that the number, shape, and direction of rugae exhibit variations across different blood groups, though some correlations were found to be statistically insignificant ($p > 0.05$).
• Number of Rugae: The majority of participants had 3–5 rugae on both sides of the palate, with variations observed among different blood groups.
• Length of Rugae: Primary-type rugae were predominant across all blood groups, with secondary and fragmented types being less common.
• Shape of Rugae: Wavy patterns were the most frequent across all groups, while circular patterns were more prominent in the AB blood group.
• Direction of Rugae: Forwardly directed rugae were more common, especially in individuals with blood group B, while backward-directed rugae were most frequent in blood group A.
These findings align with previous studies, supporting the potential role of this a atomic structure as a reliable tool in sex differentiation . Although gender differences in rugae patterns have been noted, their forensic significance requires further exploration. Given the stability of PR patterns over a lifetime, their use in forensic odontology, anthropology, and personal identification remains promising. However, additional large-scale studies are necessary to establish stronger correlations and validate their forensic applicability.

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TABLE 1:

NO OF RUGAE	LEFT RUGAE		RIGHT RUGAE	
	Frequency	**Percentage**	**Frequency**	**Percentage**
3	**132**	**18.5**	**111**	**18.5**
4	**127**	**21.2**	**127**	**21.2**
5	**130**	**21.7**	**130**	**21.7**
6	**114**	**19.0**	**114**	**19.0**
7	**118**	**19.7**	**118**	**19.7**

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TABLE 2

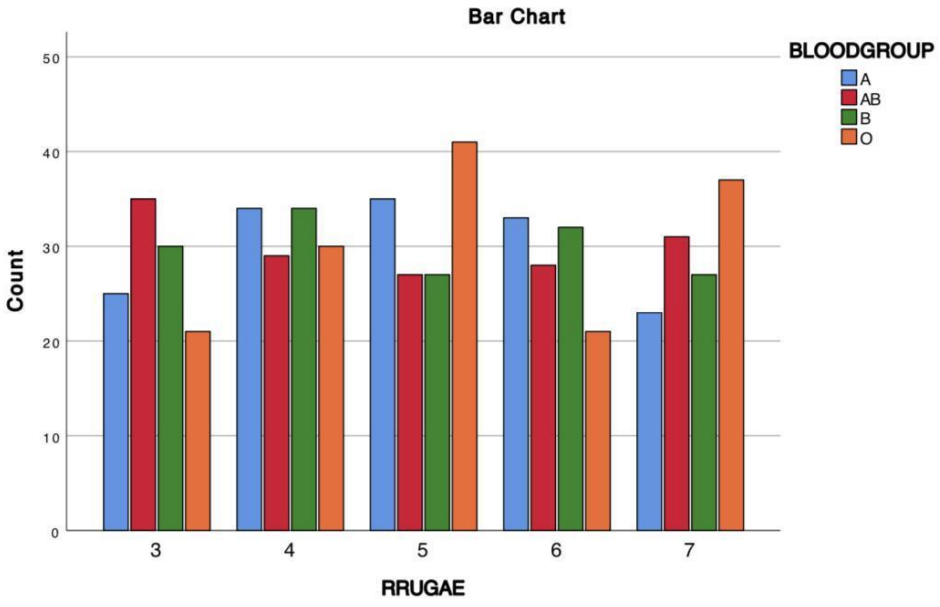
VALUE	LENGTH		
	Fragmentary	primary	seconday
FREQUENCY	1	595	4
PERCENTAGE	0.2	99.2	0.7

TABLE 3:

VALUE	SHAPE			
	Circular	Curved	Straight	Wavy
Frequency	55	181	64	300
Percentage	9.2	30.2	10.7	50.0

TABLE 4:

VALUE	DIRECTION	
	FORWARD	BACKWARD
Frequency	480	120
Percentage	80.0	20.0



GRAPH 1

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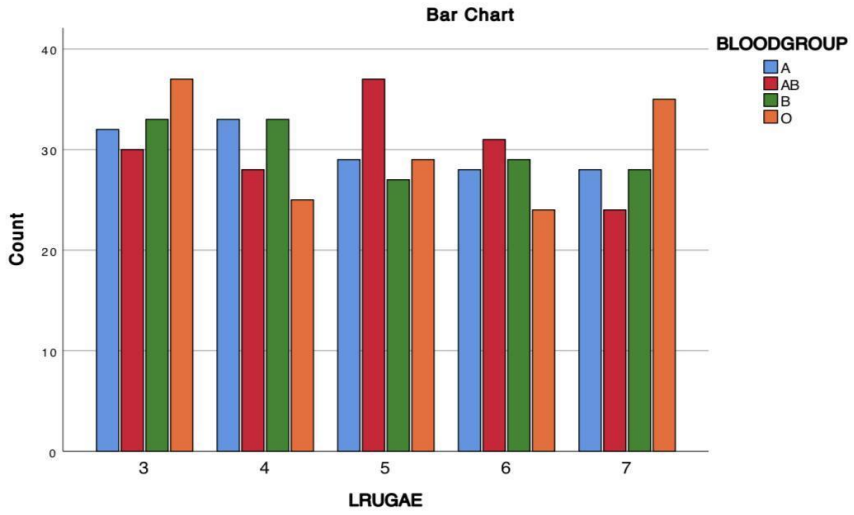
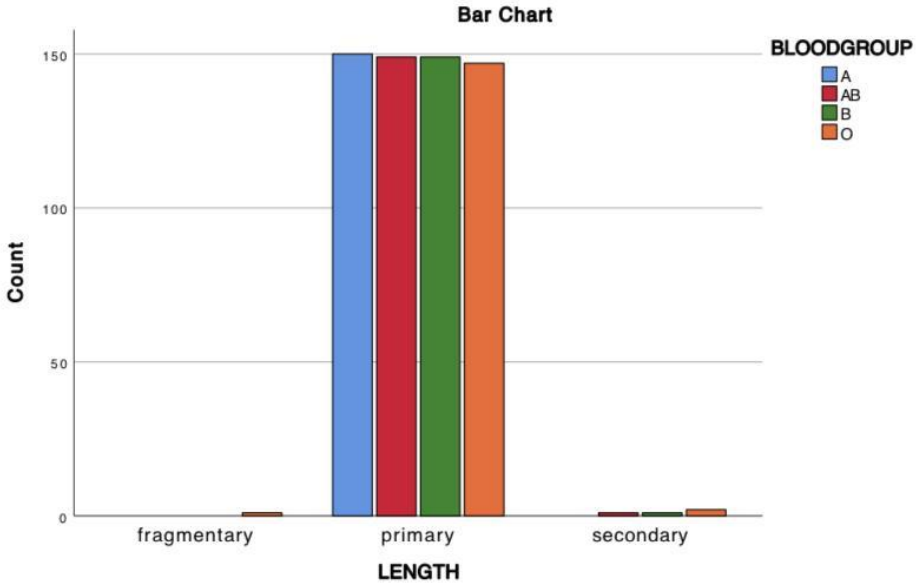
Graph 2



Graph 3



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