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ORIGINAL ARTICLE

A Study of Inheritance Pattern of Palatal Rugae among Two Generations

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ABSTRACT

CONTEXT: Palatal rugae plays very important role in identification of individual. It is important dental evidence as it remains unchanged during lifetime. Palatal rugae are roof of hard palate on anterior portion. Studies have been done that no two palates are alike in their layout. Many factors, such as chemical treatments, heat, or disease do not effect on outline and shape of pattern. **AIMS:** To study of inheritance of palatal rugae pattern among two generation 60 dental casts were selected of father, mother and off springs. They are examined for any similarity and dissimilarity in palatal rugae pattern. Examination of rugae pattern was done according to Thomas and kotze classification. **CONCLUSION:** No significant difference was seen in rugae pattern from father to offspring and mother to offspring. This study shows the percentage of inheritance on the basis of total number of rugae pattern in among from father to offspring is 30% and from mother to offspring is 25% and dissimilarities from father to offspring is 70% and mother to offspring is 75%. Palatal rugae are unique to every individual. Palatal rugae can be used as an ancillary tool in identification of individual in forensic science.

KEYWORDS | dental casts, inheritance, odontology, palatal rugae, rugoscopy

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INTRODUCTION

Individual recognition is the main key for forensic science especially when they are dealing with some kind of offense that has gone through harm behind belief.[1] The particular technique in identification is DNA fingerprinting, forensic radiography, retinal examination, fingerprint detection and odontology. DNA testing is commonly used but it is costly and cannot be conducted by everyone. Individual identification focused on differentiation within antemortem and postmortem.[2] The study of palatal rugae is known as palatoscopy or rugoscopy. It is useful in sex determination.[3] Palatal rugae formation is not changed throughout growth. It is stable throughout life. Palatal rugae are uneven, asymmetrical and they exist on all edge of mid palatine and in the back of incisive papilla of the incisive papilla.[4]

Overall rugae pattern is applicable in individual identification have been considered relevant for human identification because it is stable throughout life and it is equal to the fingerprint that is unique to each and every individual. Rugae pattern do not increase after ten years of age. Rugoscopy is also significant in orthodontic and in the identification of diseases.[5] Palatal rugae formation towards 3 months of intrauterine life. Maturation of palatal rugae is maintained by the epithelial-mesenchymal cells. In human embryos, the first rugae are distinguished 32mm next to incisive papilla. Palatal rugae are organized in transverse direction coming from palatine raphe situated in the mid sagittal plane.[6] Chemical, heat, or disease does not affect on outline and shape of the pattern. If palatal rugae destroyed then they are reproduced exactly on the same site. Rugae pattern are protected by the inside place in the head from trauma, heat.[7] Palatal Rugae required in oral swallowing, Palatal rugae involve in the

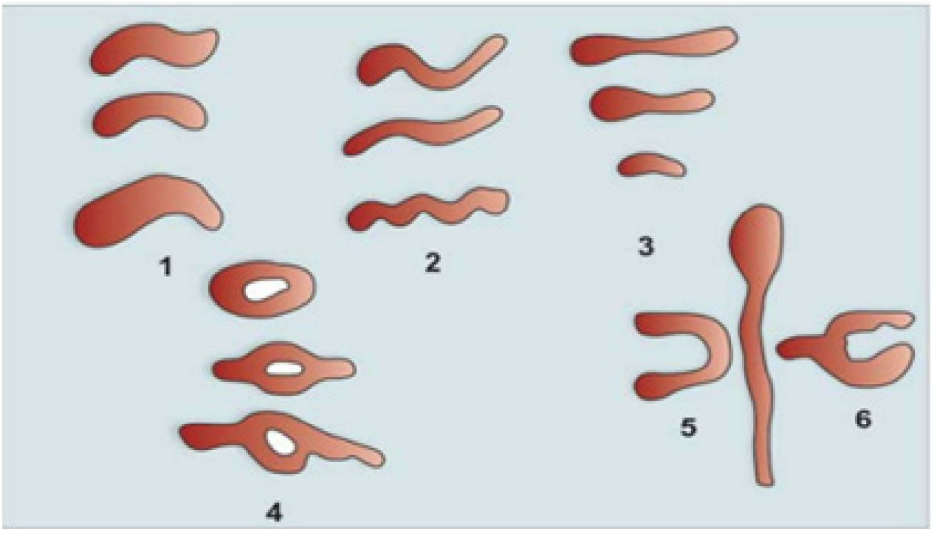

Figure 1: Shapes of palatal rugae patterns [9]

production of speech particularly in "S" and "SH" and involve suction in children.[8]

METHOD

This study was conducted on selected individuals of Punjab population. The materials for this study included 20 families. Selected individuals of families like Father, Mother and offspring were taken for the study. 60 dental casts of father, mother and offspring's were taken for the study. All casting samples were free from bubbles. This involves study of shape, number, length and unification of palatal rugae. Dental perforated tray was used for sample collection. Alginate powder mixed with water and maxillary impression were taken. Dental impressions were taken within 2 minutes. After impression taken dental stone powder were poured on impressions. Dental cast was prepared within 45 minutes. On caste sample marking of rugae pattern was done with help of pencil by using hand lens under sufficient light. Examination of rugae pattern was done according to Thomas and kotze classification. Rugae pattern measurement was done with the help of caliber in milimeters. Palatal rugae length was measured from each side and according to length it was divided into primary, secondary and fragmented rugae.

RESULT

Parameter 1: Inheritance on the basis of whole rugae pattern

The palatal rugae pattern sample was collected from 20 families (20*3=60 individual). This study shows the percentage of inheritance on the basis of Total number of rugae pattern in among from father to offspring is 30% and from mother to offspring is 25% and dissimilarities from father to offspring is 70% and mother to offspring is 75%. This study shows the percentage of inheritanceon the basis of primary rugae from father to offspring is 40% and from mother to offspring is 15% and dissimilarities from father to offspring is 60% and mother to offspring is 85%.This study shows the percentage of inheritanceon the basis of secondary rugae from father to offspring is 25% and from mother to offspring is 15% and dissimilarities from father to offspring is 75% and mother to offspring is 85%. This study shows the percentage of inheritance on the basis of fragmented rugae from mother to offspring is 5% and dissimilarities from father to offspring is 100% and mother to offspring is 95%.

Parameter 2: Inheritance on the basis of right side Rugae: This study shows the

TOTAL NO. OF FAMILIES (SAMPLE: 20*3=60)	(20)	INHERITANCE PERCENTAGE
Number of families showing similarities from father to offspring	6	30%
Number of families showing similarities from mother to offspring	5	25%
Number of families showing dissimilarities from father to offspring	14	70%
Number of families showing dissimilarities from mother to offspring	15	75%

Table 1: Testing Water body distribution of drowning.

TOTAL NO. OF FAMILIES (SAMPLE: 20*3=60)	(20)	INHERITANCE PERCENTAGE
Number of families showing similarities from father to offspring	8	40%
Number of families showing similarities from mother to offspring	3	15%
Number of families showing	12	60%
Number of families showing dissimilarities from mother to offspring	17	85%

Table 2: Inheritance on the basis of primary rugae in percentage

TOTAL NO. OF FAMILIES (SAMPLE: 20*3=60)	(20)	INHERITANCE PERCENTAGE
Number of families showing similarities from father to offspring	5	25%
Number of families showing similarities from mother to offspring	3	15%
Number of families showing dissimilarities from father to offspring	15	75%
Number of families showing dissimilarities from mother to offspring	17	85%

Table 3: Inheritance on the basis of secondary of rugae in percentage

TOTAL NO. OF FAMILIES (SAMPLE: 20*3=60)	(20)	INHERITANCE PERCENTAGE
Number of families showing similarities from father to offspring	Nil	Nil
Number of families showing similarities from mother to offspring	1	5%
Number of families showing dissimilarities from father to offspring	20	100%
Number of families showing dissimilarities from mother to offspring	19	95%

Table 4: Inheritance on the basis of fragmented rugae in percentage.

TOTAL NO. OF FAMILIES (SAMPLE: 20*3=60)	(20)	INHERITANCE PERCENTAGE
Number of families showing similarities from father to offspring	4	20%
Number of families showing similarities from mother to offspring	6	30%
Number of families showing dissimilarities from father to offspring	16	80%
Number of families showing dissimilarities from mother to offspring	14	70%

Table 5: Inheritance on the basis of total number of rugae on right side in percentage

TOTAL NO. OF FAMILIES (SAMPLE: 20*3=60)	(20)	INHERITANCE PERCENTAGE
Number of families showing similarities from father to offspring	8	40%
Number of families showing similarities from mother to offspring	10	50%
Number of families showing dissimilarities from father to offspring	12	60%
Number of families showing dissimilarities from mother to offspring	10	50%

Table 6: Inheritance on the basis of primary rugae on right side in percentage

TOTAL NO. OF FAMILIES (SAMPLE: 20*3=60)	(20)	INHERITANCE PERCENTAGE
Number of families showing similarities from father to offspring	6	30%
Number of families showing similarities from mother to offspring	5	25%
Number of families showing dissimilarities from father to offspring	14	70%
Number of families showing dissimilarities from mother to offspring	15	75%

Table 7: inheritance on the basis of secondary rugae on right side in percentage

TOTAL NO. OF FAMILIES (SAMPLE: 20*3=60)	(20)	INHERITANCE PERCENTAGE
Number of families showing similarities from father to offspring	Nil	Nil
Number of families showing similarities from mother to offspring	Nil	Nil
Number of families showing dissimilarities from father to offspring	20	100%
Number of families showing dissimilarities from mother to offspring	20	100%

Table 8: Inheritance on the basis of fragmented rugae on right side in percentage.

TOTAL NO. OF FAMILIES (SAMPLE: 20*3=60)	(20)	INHERITANCE PERCENTAGE
Number of families showing similarities from father to offspring	6	30%
Number of families showing similarities from mother to offspring	6	30%
Number of families showing dissimilarities from father to offspring	14	70%
Number of families showing dissimilarities from mother to offspring	14	70%

Table 9: Inheritance on the basis of total number of rugae on left side in percentage

TOTAL NO. OF FAMILIES (SAMPLE: 20*3=60)	(20)	INHERITANCE PERCENTAGE
Number of families showing similarities from father to offspring	6	30%
Number of families showing similarities from mother to offspring	5	25%
Number of families showing dissimilarities from father to offspring	14	70%
Number of families showing dissimilarities from mother to offspring	15	75%

Table 10: Inheritance on the basis of primary rugae on left side in percentage

TOTAL NO. OF FAMILIES (SAMPLE: 20*3=60)	(20)	INHERITANCE PERCENTAGE
Number of families showing similarities from father to offspring	4	20%
Number of families showing similarities from mother to offspring	5	25%
Number of families showing dissimilarities from father to offspring	16	80%
Number of families showing dissimilarities from mother to offspring	15	75%

Table 11: inheritance on the basis of secondary rugae on left side in percentage

TOTAL NO. OF FAMILIES (SAMPLE: 20*3=60)	(20)	INHERITANCE PERCENTAGE
Number of families showing similarities from father to offspring	2	10%
Number of families showing similarities from mother to offspring	Nil	Nil
Number of families showing dissimilarities from father to offspring	18	90%
Number of families showing dissimilarities from mother to offspring	20	70%

Table 12: inheritance on the basis of fragmented rugae on left side in percentage

percentage of inheritance on the basis of total number of rugae from father to offspring is 20% and from mother to offspring is 30% and dissimilarities from father to offspring is 80% and mother to offspring is 70%. This study shows the percentage of inheritance on the basis of primary rugae from father to offspring is 40% and from mother to offspring is 50% and dissimilarities from father to offspring is 60% and mother to offspring is 50%. This study shows the percentage of inheritance on the basis of secondary rugae from father to offspring is 30% and from mother to offspring is 25% and dissimilarities from father to offspring is 70% and mother to offspring is 75%. This study shows the percentage of inheritance on the basis of fragmented rugae shows dissimilarities from father to offspring is 100% and mother to offspring is 100%.

Parameter 3: Inheritance on the basis of left side rugae. This study shows the percentage of inheritance on the basis of Total number of rugae from father to offspring is 30% and from mother to offspring is 30% and dissimilarities from father to offspring is 70% and mother to offspring is 70%. This study shows the percentage of inheritance on the basis of primary rugae from father to offspring is 30% and from mother to offspring is 25% and dissimilarities from father to offspring is 70% and mother to offspring is 75%. This study shows the percentage of inheritance on the basis of secondary rugae from father to offspring is 20% and from mother to offspring is 25% and dissimilarities from father to offspring is 80% and mother to offspring is 75%.This study shows the percentage of inheritanceon the basis of fragmented rugae from father to offspring is 10% and dissimilarities from father to offspring is 90% and mother to offspring is 100%.

CONCLUSION

For identification of human there are various techniques like DNA fingerprinting, forensic radiography, retinal examination, fingerprint detection and odontology. Palatal rugae auspiciously used for personal recognition due to its uniqueness. Palatal rugae are unique in each and every individual and it is remain unchanged throughout the life. The position of rugae pattern is unchanged and not effected by any disease, trauma or chemical. Due to its low cost it is used in personal recognition. The study of palatal rugae is reliable and simple. IJFMP

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