



Original Research Article

A Study on Patterns of Lip Prints in Central Karnataka Region

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ABSTRACT

Background: The last few decades have seen the development of exaggerated importance of lip-prints as one of the dermatoglyphics, which may be helpful in identification and diagnosis of congenital diseases and anomalies.

Aim and objectives: To study the individualistic pattern of lip-prints and to compare lip-print configuration between parents of cleft-lip individuals and controls in the general population.

Setting and design: The present study was carried out in Bapuji hospital (under the smile train project) and SSIMS hospital at Davangere.

Materials and methods: The present study was carried out on 200 individuals – 100 in the study group which included both parents of 50 children diagnosed with cleft-lip with or without palate (CL / P) and 100 in the control group, which included both parents of 50 non cleft-lip individuals.

Statistical analysis: Data was compiled, tabulated and analyzed using percentages. Chi square test, Student's unpaired 't' test and Fisher's exact test were also used. Results: It was observed that Type II b was the most common pattern in both fathers and mothers of the study group in 34% and 44% respectively.

Conclusion: Significant association was found out between distribution of lip pattern in fathers in both cases and controls.

Key Words: Lip-prints; Cleft-lip; Cleft palate;

INTRODUCTION

Human identification is a mainstay of civilization and the identification of unknown individual always has been of paramount importance to society. The traditional methods for personal identification include anthropometry, fingerprints, sex determination, estimation of age, measurement of height, identification

with a specific individual, and differentiation by blood group, which have proven successful in many cases. Lip print pattern and radiographic configuration of frontal sinus are one among the other methods, which can be used as an aid in personal identification because of their uniqueness. ^[1] Lip prints are the normal lines and fissures in the zone of transition of

human lip between labial mucosa and the outer skin. They are identifiable as early as the sixth week of intrauterine life, and from that time on, their pattern rarely changes, resisting many afflictions such as herpetic lesions. ^[2] The wrinkles and grooves on labial mucosa, called sulci-labiorum forms a characteristic pattern and the study of which is referred to as cheiloscopy. ^[3] In case when the lines are not clear, individual identification of a human being is possible by examining the substance which constitutes the trace e.g. saliva. The potential for DNA typing from the lip print is evidentially here. ^[4] Lip prints are unique and do not change during the life of a person. It has been verified that they recover after undergoing alterations like trauma, inflammation and diseases like herpes. Unlike fingerprints, unanimity still does not exist between investigators to accept cheiloscopy as a method of human identification. ^[5] Lip print recognition architecture is also being developed to include lip prints in conjunction with other physical features for biometric identification. ^[6]

The last few decades have seen the development of exaggerated importance of lip prints as another skin impression, which may be useful in identification and diagnosis of congenital diseases and anomalies. ^[7] Problems of cleft-lip with or without palate (CL/P) are among the major social issue. Since lip-prints show a hereditary pattern, the present study is proposed to know the lip-print pattern in parents of individuals of cleft lip with/without cleft palate and to find out if any distinctive pattern is noted in these parents. Very few studies are available on lip-print patterns related to cases of cleft. Hence, the study is undertaken.

MATERIALS AND METHODS

The present study was carried out on 200 individuals- 100 in the study group and 100 in the control group as follows:

Cases: Both parents of 50 cleft-lip individuals attending Bapuji hospital (under the smile train project) and SSIMS hospital at Davangere.

Controls: Both parents of 50 non cleft-lip individuals were included.

Data was compiled, tabulated and analyzed using percentages. Chi square test, Student's unpaired t test and Fisher's exact test were also used.

Method of collection of data: Informed consent of the subjects was taken after explaining the procedure to them. The subject was asked to clean the lips (using sanitary tissues). Then lips were smeared with a thin layer of skin care cream evenly (using ear buds) and the subject asked to rub his /her lips together to spread the smear uniformly. Ear bud used to apply skin care cream to the lips was discarded, maintaining strict aseptic conditions. After about 2 minutes, with partially-opened mouth, impression of lip was made on a strip of white paper, with central portion of lips dabbed first and then pressing it uniformly along the left and right corners of the lips. Care was taken to avoid slipping of lips, so as to avoid smudging of the lip-prints. At least two impressions were obtained from each individual. The lip impressions so obtained were visualized by using fingerprint dusting powder and brush. The resultant prints were fixed with a transparent cellophane tape, so that the prints were not disturbed and preserved for a longer time. The print-pattern so acquired was assigned with a number and divided into six quadrants- three in upper lip and another three in lower lip using measuring scale. The lip-prints were studied using magnifying lens and were analysed quadrant-wise for different patterns of lip-prints.

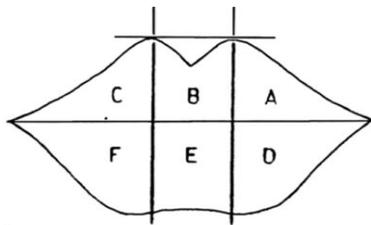


Figure 1: Showing division of lips into six quadrants.

Each lip print was thus divided into six such quadrants and studied for different types of lip prints in each quadrant. [Fig 1]

Inclusion criteria: Parents of individuals diagnosed with cleft-lip with or without cleft palate were included.

Exclusion criteria: Individuals with any scar, injury or other deformity of the lips were excluded. Subjects with family history of clefting were excluded from the control group.

RESULTS

TABLE 1: Showing percentage distribution of patterns of lip-prints in fathers compared between cases and controls.

Fathers	Cases		Controls	
	No.	%	No.	%
Ia	14	28	19	38
IIa	3	6	2	4
IIb	17	34	13	26
IIc	11	22	11	22
III	1	2	1	2
IV	0	0	1	2
V	4	8	3	6
Total	50	100	50	100

$$X^2 = 12.3, P=0.01$$

Table 1: shows percentage distribution of various patterns of lip-prints in fathers. It was observed that Type II b was the most common pattern among cases (17 cases – 34%) and Type III was the least common pattern seen in 2% cases. Type IV pattern was not seen as a predominant type even in a single case. Type I a was the most common pattern seen in 19 subjects (38%) and the least common patterns were Type III and Type IV seen in 1 case each (2%) in the control group. This comparison between

cases and controls is statistically significant ($p=0.01$).

TABLE 2: Showing percentage distribution of different patterns of lip-prints among cases and controls in mothers.

Mothers	Cases		Controls	
	No.	%	No.	%
Ia	14	28	22	44
IIa	3	6	3	6
IIb	22	44	9	18
IIc	6	12	11	22
III	0	0	1	2
IV	1	2	0	0
V	4	8	4	8
Total	50	100	50	100

$$X^2 = 7.8, P=0.10$$

Table 2: shows percentage distribution of patterns of lip-prints in mothers (cases and controls). It was noted that Type II b was the predominant pattern seen among 22 cases (44%) whereas Type IV was the least common pattern (2%). Type III was not seen at all in the study group. Among the control group, Type Ia was the predominant pattern seen in 22 subjects (44%) compared to Type II a seen in 3 subjects (6%) which was the least common pattern. Types III and IV were not to be seen in this group. The comparison between these two groups is not significant.

TABLE 3: Showing distribution of lip-print patterns in general between cases and controls.

Pattern	Cases	Controls
Ia	28	41
IIa	5	5
IIb	40	23
IIc	17	22
III	1	1
IV	1	1
V	8	7
Total	100	100

$$X^2 = 7.8, P=0.10$$

Table 3: shows the overall distribution of various lip-print patterns between cases and controls in common among fathers and mothers. It was observed that Type II b was the commonest pattern seen in 40 cases, followed by Type I a (28), Type II c (17), Type V (8) and Type II a (5). Types III and IV were the least common

patterns seen in 1 case each. In the control group, Type I a was the predominant pattern seen in 41 subjects while Types III and IV were the least common patterns seen in 1 subject each. P value is not significant in this comparison.

TABLE 4: Showing distribution of patterns of lip-prints among various quadrants in fathers (Fa) and mothers (Mo) of the study group (cases).

Patterns	Cases	A	B	C	D	E	F
I a	Fa	5	3	4	3	5	1
	Mo	1	2	1	0	2	0
I b	Fa	23	16	12	5	7	9
	Mo	21	16	19	7	8	8
II a	Fa	7	5	9	1	1	2
	Mo	9	7	7	2	2	1
II b	Fa	9	13	12	25	18	17
	Mo	10	16	11	23	21	19
II c	Fa	2	5	3	18	11	14
	Mo	1	3	3	11	8	14
III	Fa	0	2	3	0	2	2
	Mo	0	0	1	1	0	2
IV	Fa	0	1	0	1	2	0
	Mo	1	1	0	0	9	1
V	Fa	1	6	5	1	2	3
	Mo	4	4	4	3	1	4

Table 4: shows the distribution of various lip-patterns in individual quadrant out of the total 300 quadrants (50 cases*6 quadrants) each in the study group of fathers and mothers. In the upper lip (quadrants A, B, C), type I b was predominant while in lower lip (quadrants D, E, F) and overall, type II b was predominant, followed by type II c. Type III was seen in 9 and 4 quadrants, being the least common pattern overall; Type IV was seen in 4 and 12 quadrants in fathers and mothers respectively. Not much difference was seen in both the sexes with respect to predominant pattern.

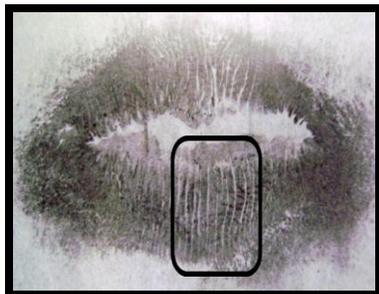


Fig 2a: TYPE I a
Complete straight grooves
(case no. 27 - mother)

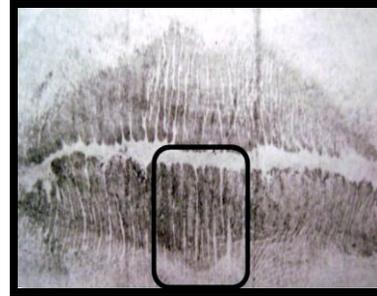


Fig 2b: TYPE I b
Partial straight grooves
(case no. 2 - mother)

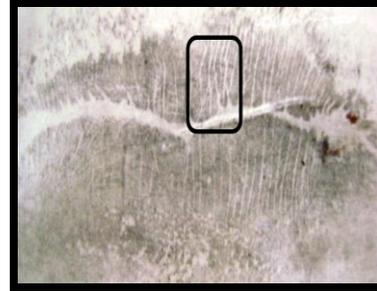


Fig 2c: TYPE II a
Grooves branching towards occlusal margin
(case no. 1 - father)

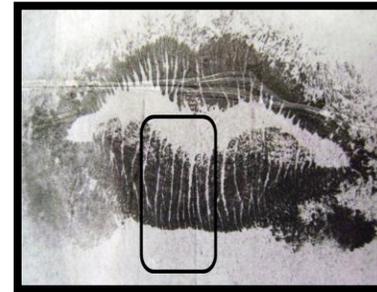


Fig 2d: type ii b
grooves branching towards free margin
(control no.11- father)

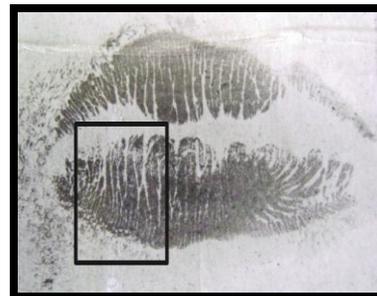


fig 2e: type ii c
compound branching grooves
(control no.18 - mother)

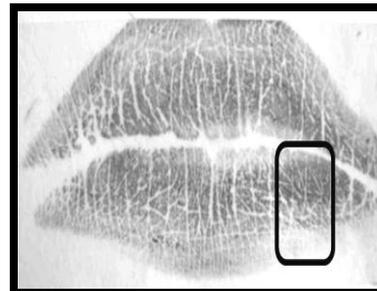


Fig 2f: TYPE III
Intersected grooves
(control no. 23- father)

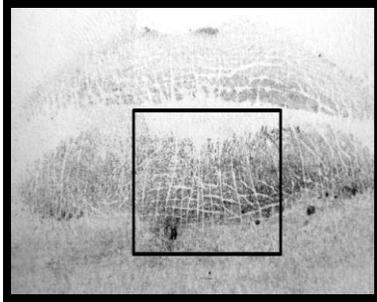


Fig 2g: **TYPE IV**
Reticular
grooves
(case no.19- mother)

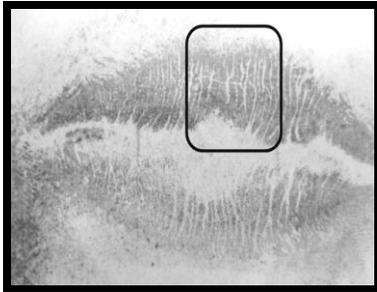


Fig 2h: **TYPE V**
Undifferentiated
grooves
(case no.29 - father)

Figure 2: Showing different patterns of lip-prints found in the present study.

DISCUSSION

It was observed that Type II b (34%) was more common in fathers in the study group and Type III (2%) the least common pattern. In the control group, Type I a (38%) was the commonest pattern as compared to Type III and Type IV (2% each) which were the least common patterns. In case of mothers, Type II b (44%) was the predominant pattern and Type IV (2%) was the least common pattern in the study group.

Contrast to our study findings, study done by Saraswathi TR [8] revealed that Type IV (intersected pattern) was the most common pattern both among males and females having 39.5 % and 36.5% respectively. The least common pattern was Type V (reticular pattern) seen in 11% in males and 13% in females. Hence, lip-prints have got a quadrant-wise predilection for the sex of an individual.

A study was done by Verghese AJ et al. [9] and the middle 1 cm. of lower lip was taken as the study area. It was observed that type IV (reticular pattern) was the predominant type in both sexes. Lip prints

were collected from a total of 200 dental students where it was observed that Type II (branching pattern) was predominant in males in third and fourth quadrants where as Type I (complete vertical) pattern was found to be dominant in females in third and fourth quadrants. Type III (crisscross) pattern did not occur in third and fourth quadrants at all. It was concluded that lip prints have a quadrant wise predilection and distribution of lip prints is unique for males and females. They also behold a potential in individual identification like fingerprints. [4]

CONCLUSION

From the present study, we can conclude that, no two lip-prints matched with each other and Type II b is predominant in the study group while Type I a in the control group. Type III found in very few quadrants of the study group of both fathers and mothers. Similar study on a large group and studying the lip-prints of cleft lip children can help in the expectance of anomaly of cleft lip in children.

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