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Correlation of Lip Prints, Palm Prints and Abo Blood Group among Student Based Population in Mangalore- A Pilot Study

1. Ajay Kumar, MDS, 2. Prithul Poddar, 3. Tanmay Srivastava, 4. Monika Yadav, BDS, 5. Prateek Banerjee, 6. Abhiduptta Dutta, 7. Anwesha Biswas, MDS

Private Practitioner PatnaIndia.
Post graduate Trainee 3rd year Department of Pedodontics and Preventive Dentistry, Darshan Dental College & Hospital, LoyaraIndia.
Post graduate Trainee 3rd year Department of Oral Medicine and Radiology, Sardar Patel Post Graduate Institute of Dental and Medical Sciences, LucknowIndia.
Institute of Dental Education and Advanced Studies, Gwalior India.
Post Graduate Trainee 1st year Department of Public Health Dentisry Career Post Graduate Institute of Dental Sciences, Hospital, Lucknow
Private Practitioner,Bakura India.
Private Practitioner Lucknow India

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ABSTRACT
AIM: To determine correlation between Lip prints, Palmprints and ABO Blood Group which may help in forensic identification.
MATERIALS AND METHODS:30 healthy subjects (15 males and 15 females) 18 to 25 years of age, amongst native of Mangalore based population were selected for the study. Lip prints and palmprints were recorded using a manual technique for each patient with classifications given by Suzuki and Tsuchihashi, and Wu et al respectively along with their authentic blood group report. The data obtained were subjected to statistical analysis using SPSS software version 22.0.
RESULTS: The most common lip and palm pattern recorded was Type II and Category V respectively in both the genders. The most common blood group of females obtained in the present study was B+ whereas in males it was O+.
CONCLUSION: Statistically significant correlation was found between lip prints with left and right palmprints among females. The correlation between blood groups with lip and palmprints was found to be insignificant. In males, correlation was found to be insignificant except between blood group and palmprint. Further a study needs to be followed up with larger sample size for definitive results.

KEYWORDS: Lip prints, Palmprints, Blood group, Forensics tool, Cheiloscopy

I. INTRODUCTION

The personal identification of the living or dead individuals by using distinct characteristics gross or molecular level is the basic essence of forensic (1).Although the mostcommonly used identification tools are fingerprint analysis, DNA testing etc., but some supplementary aids like lip prints, bite marks, palatal rugae pattern, ABO blood grouping of blood stains holds equal importance for accurate human identification in current scenario (2).

The palm prints, lip prints and blood remains are common proofs which can be utilized for forensic identification purpose. The use of these three physical forms is of prime significance, because attempting personal recognition by measures like DNA analysis is a sensitive and less expensive method, making it difficult to use for every case (3). The epidermal ridges of the fingers and palms are formed from ectoderm during 6-9 weeks in utero and are unique for each individual (3,4).Comparative studies of lip and palm prints are scanty in the literature and studies showing their correlation with ABO blood grouping are even rare. The classification of lip prints was given by Suzuki and Tsuchihashi in 1971 (Figure 1) (5).

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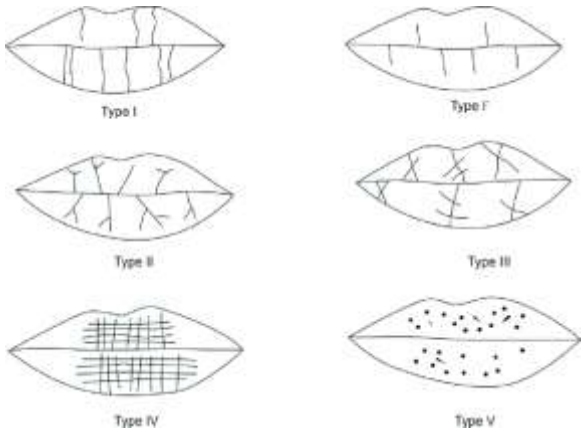

Fig 1. Classification of Lip Prints given by Suzuki and Tsuchihashi.

Palm prints were classified into six categories according to number of Principal and intersecting lines, as proposed by Wu et al in 2004 (Figure 2) (6).

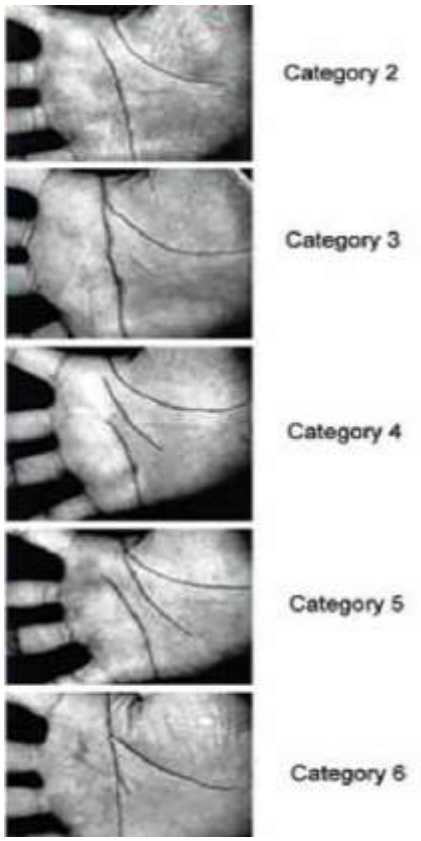

Fig 2. Classification of Palm Prints given by Wu et al.

The ABO system of blood grouping was discovered by Landsteiner K in 1901, which is further classified as A, B, AB, O based on the presence of the corresponding antigen in the plasma. Rh+ and Rh- (Rhesus system) based on the presence or absence of D antigen (7). Although a limited number of studies is available showing correlation between these three variables, but few showed significant correlations between them. (8-10).No study is available considering these three parameters in Mangalore based population. Considering this shortcoming, this study was designed to find a correlation between these three variables. Hence, with this background, the present study was carried out to investigate the prevalence and correlation of lip print patterns, palm print

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patterns and ABO blood groups between both the genders in the population of Mangalore city.

II. MATERIALS AND METHODS

The study group comprised of 30 healthy subjects (15 males and 15 females). Participants were selected randomly from the OPD of the Department of Oral Medicine & Radiology based on inclusion and exclusion criteria. Subjects aged 18-25 years, who are native of Mangalore, having a valid document for blood group and who were willing to take part in the study were included in the study. Subjects with permanent scars on palm or lips, with lip abnormalities such as cleft lip and allergic to lipsticks, were excluded from the study. The institutional ethics committee clearance was obtained. Informed consent was obtained from the subjects included in the study. The materials comprised of the following (Figure 3.)

1. Red colored creamy lipstick
2. Cylindrical bottle
3. Mirror
4. A4 sheet
5. Cellotape
6. Scissor
7. Sterile Cotton
8. Hand Wash
9. Roller
10. Printer's ink
11. Kodak Digital Camera
12. Valid document of blood grouping

Fig 3. The Armamentarium illustrates for the collection of impressions.

METHOD OF COLLECTION OF LIP PRINTS

The subjects were asked to sit comfortably on a chair and procedure was carried out wearing sterile hand gloves and mouth mask.The subject was asked to open the mouth and a red coloured creamy lipstick was applied on the lips uniformly, starting from middle and moving laterally. The subjects were instructed to roll the lips inwards for even spread of lipstick. A new A4 sheet was used for collecting the lip prints. The paper was foldedand the participants were asked to give the sample. Keeping the oral fissure closed in the normal resting position, part of the A4 sheet was placed on the closed lips by dapping in the centre first and then pressing it comfortably towards the corners of the lips. The strip of cellophane tape was then stuck on the A4 sheet for a permanent record to ensure that there was no smudging of lips. The subject was provided with sterile cotton to rub the colour of lipstick. After recording the lip prints, photographs were taken using high-resolution digital camera.

METHOD OF COLLECTION OF PALM PRINTS

About 2-3 drops of fingerprint ink were taken on glass slab and spread laterally by using the roller. The ink was directly placed on the palm of the subject with the help of roller. The palm prints were obtained on the cylindrical bottle and the subject was asked to keep the wrist on the paper and then asked to roll downwards and then the impressions were obtained ensuring that all the fingers and the palmar creases touch the paper. Then palm prints were recorded on an A4 paper. After recording the palm print photographs were taken using high-resolution digital camera.

METHODS OF COLLECTION OF ABO BLOOD GROUPS

ABO blood group of each patient was recorded from a valid document of blood group testing. The lip prints, palm prints and ABO blood group are presented by using counts and percentages. The

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data obtained were analysed by using **SPSS Version 22.0.**

III. RESULTS AND OBSERVATIONS

The present study was conducted to investigate the prevalence and correlation of lip print patterns, palm print patterns and ABO blood group among both the genders to identify individuals and for sexual dimorphism in the student population of Mangalore. The results were evaluated and subjected to statistical analysis using SPSS software (Version 22.0).

The observations of the study were derived from the results obtained with statistical evaluation. The various parameters were derived for both males and females to evaluate sexual dimorphism. The parameters evaluated were lip print patterns, palm print patterns and ABO blood groups.

Lip print Patterns among females in the present study was found to be (20%) in Type I (**73.3%**)in Type II**,** (6.6%) in Type III; whereas in males (20%) in Type I, (**66.7%**) in Type II and (13.3%) in Type III. The most common pattern was being Type II in both the genders (Table 1, Figure 4).

Table 1. Gender Wise Percentage Distribution of Lip prints

Type of lip print	Lip print n(%)	
	Female	Male
I	3(20)	3(20)
II	**11(73.3)**	**10(66.7)**
III	1(6.6)	2(13.3)
IV	NIL	NIL
V	NIL	NIL

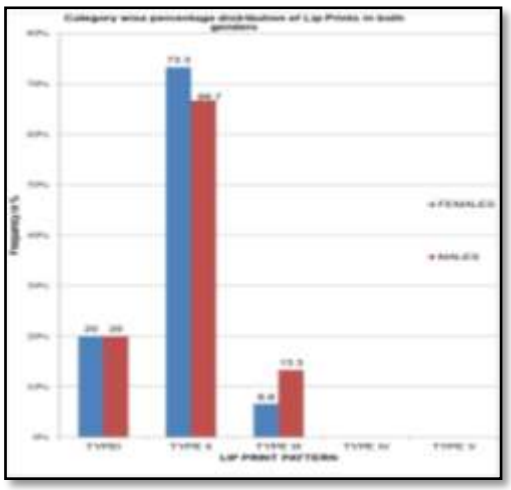

Fig 4. Graph showing category wise percentage distribution of lip prints in both the genders.

The different right palm print patterns among females in the present study was found to be (20%) in Category III, (26.7%) in Category IV and (**53.3%**)in Category V**;** whereas in males (26.7%) in Category III, (13.3%) in Category IV and (**60%**) in Category V. The different left palm print pattern among females in the present study was found to be (13.3%) in Category III, (26.6%) in Category IV and **(60%)** inCategory V. The different Left palm print pattern among males in the present study was, (20%) in Category III, (26.6%) in Category IV and (**53.3%)** in Category V. In both the genders category V was most common type in both right and left palm print pattern (Table 2,Figure 5& Figure 6).

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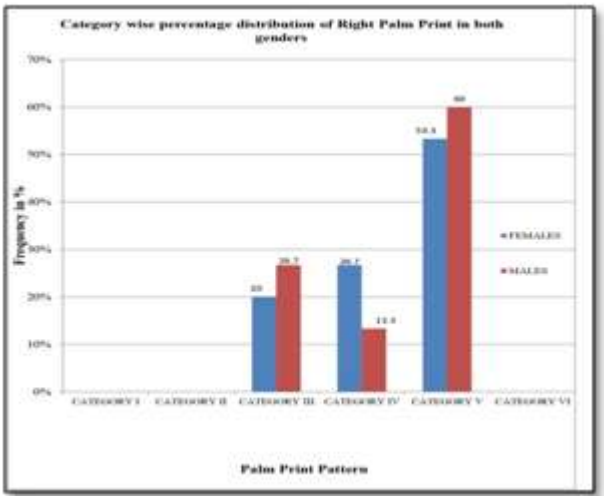
Category of Palm print	FEMALE		MALE	
	Right Palm print n(%)	Left Palm print n(%)	Right Palm print n(%)	LeftPalm print n(%)
I	NIL	NIL	NIL	NIL
II	NIL	NIL	NIL	NIL
III	3(20)	2(13.3)	4(26.7)	3(20)
IV	4(26.7)	4(26.7)	2(13.3)	4(26.7)
V	**8(53.3)**	**9(60.0)**	**9(60.0)**	**8(53.3)**
VI	NIL	NIL	NIL	NIL

Table 2. Category wise Percentage distribution of right and left palm prints in both genders.

Fig 5a. Graph showing category wise percentage distribution of right palm prints in both the genders.



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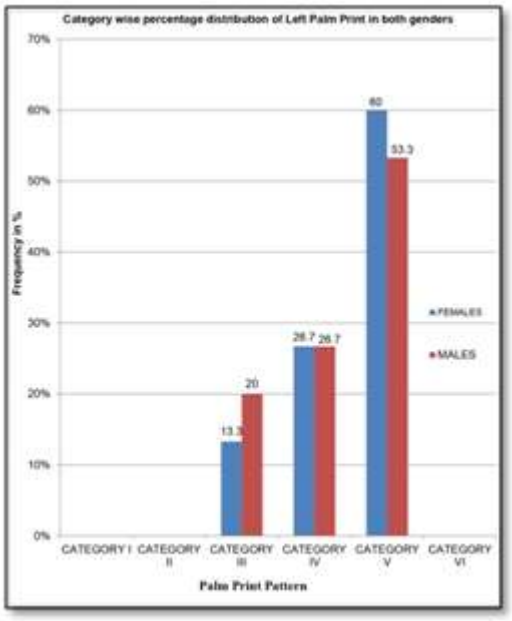

Fig 5b. Graph showing category wise percentage distribution of left palm prints in both the genders.

Blood group: B+ was found to be dominant (**73.3%**) in females followed by O+: (20%) and A+: (6.7%). Blood group O+ was found to be dominant in males (**66.7%),** followed by B+: (26.7%) and A-: (6.6%) (Table 3, Figure 6).

Blood group	Female	Male
A+	1(6.7)	NIL
A-	NIL	1(6.7)
B+	**11(73.3)**	4(26.7)
B-	NIL	NIL
O+	3(20)	**10(66.7)**
O-	NIL	NIL
AB+	NIL	NIL
AB-	NIL	NIL

Table 3.Genders wise Distribution of blood groups.

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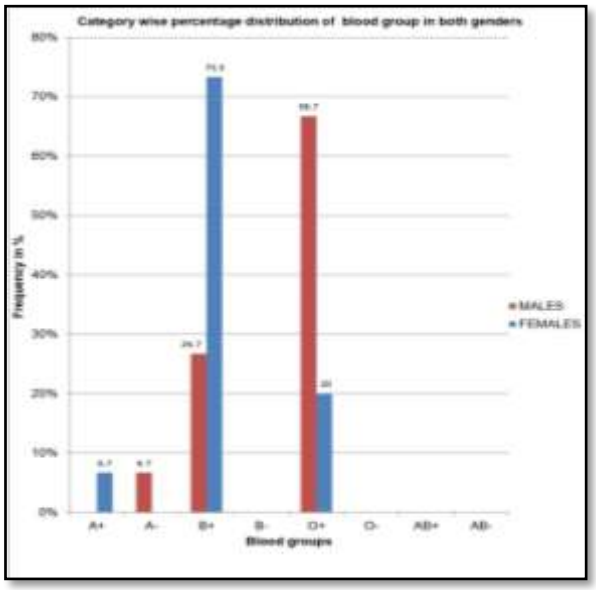

Fig6. Graph showing category wise percentage distribution of left palm prints in both the genders.

Statistical analysis was done and Correlation between three parameters was obtained by Pearson coefficient (Table 4). A statistically significant correlation between lip prints with right palm prints p- value (**0.005**) and left palm prints p-value (**0.004**) among females. The correlation between blood groups with lip and palm prints was found to be insignificant. In males no, correlation was found to be significant except between blood group and right palm print p- value (<**0.0001**)** and left palm print p- value (**0.0006****).

IV. DISCUSSION

Lip prints and palm prints are unique for each individual(3).In living person, personal identification can be done by using the previously collected records. Comparison of lip and palm analysis in gender identification and its correlation with blood group is developing into a new area of research in forensic dentistry. The lips print or lipstick marks have a chance of persistence over objects obtained in the crime scene (10).

In the present study, the most predominant lip pattern in the entire population in both the genders was Type II. Similar results have been found studies in Mangalore by Rastogi P and Parida A. (11) Maheswarietal. (12) in their study in Chennai population and Verma P et al. (13)in Rajasthan population, Nandan SR et al. (10) in Tirupati population and Gunasekaran S et al. (14) in Tiruchengode population. In our study, the predominant palm print pattern observed in both the genders were Category V which is in accordance with studies by Wu et al. (6)and Fang et al. (15), Debta FM et al. (16)in Bhubaneswar Population &and Rekha VR et al. (17)in South Kerela population. In the present study the most common blood group observed in males was O+ and in females was B+ which is in accordance tothe previous studies conducted by Verma P et al. (13). In our study a positive correlation was found between lip and palm prints in females of Mangalore population whereas no significant correlation was found in males. This issimilar tothe results obtained by Rekha VR et al. (17)in South Kerala population. There has been no study related to the correlation of lip prints and palm prints with ABO blood grouping. In this study, no significant correlation was found between lip prints and blood group for both genders. The results were in accordance with the studies conducted by Verma et al. (13)and Furnariet al.(18). However, the result is in contrast, to study by Sandhu H et al. (1) in Sriganganagar district of Rajasthan who noticed a positive correlation between lip prints and blood groups among both genders. In our study, significant correlation was found between palm print and blood groups in males which is in accordanceto the previous studies by Shivhare P R et al in Chhattisgarh Population (19).

Recent methods of evaluation of lip prints and palm prints include the digital analysis (Adobe Photoshop, Veri Finger SDK, Precise Biometrics BiomatchTM, etc.) to avoid human error in manual analysis. There are few studies using digital analysis (20).While others have been done using manual methods without any significant difference. Taking into consideration the insignificant difference between the two methods, we performed the manual method with a single observer.

Our study reflects that the supplementary physical evidence (lip prints, palm prints and ABO blood group) can be assessed by simple, non-expensive techniques, and can serve as a useful tool in forensic investigations among the Mangalore population. However, more extensive and detailed research studies using digital analysis among different populations, considering racial and ethnic backgrounds, are required to establish a significant correlation between these variables.

V. CONCLUSION

In the present study, Type II was the common lip print pattern among both the genders. Type III was the least common lip print pattern among both the genders. Category V was the common palm print pattern in the right and left palms of both the genders. In females Category III was the least common palm print pattern in right and left palms whereas in males Category III was least common palm print pattern in left palm and Category IV was the least common palm print pattern in right palm. Blood group B + was most prevalent in females while blood group O+ was found to be predominant in males. Blood group A+ was the least predominant blood group type in females while blood group A- was the least common blood group type in males. The correlation between blood groups with lip and palm prints was found to be insignificant. In males, correlation was found to be insignificant except between blood group and palm print. A statistically significant correlation between lip prints with right palm prints and left palm prints among females was found. In males significant correlation was found between blood group and right palm print and left palm print Although lip and palm prints are never similar and they remain same from birth till death, this pilot study was an effort made by us to associate lip prints, palm prints with gender and blood group of an individual, and to aid in personal identification. However, further research is required with larger sample size for definitive results.

REFERENCES

[1]. Sandhu H, Verma P, Padda S, Raj SS. Frequency and correlation of Lip Prints, Fingerprints and ABO blood groups in population of Sriganganagar District, Rajasthan. Acta Medica Academica. 2017;46(2):105-115.

[2]. Ranjan V, Sunil MK, Kumar R. Study of lip prints: A forensic study. J Indian Acad Oral Med Radiol. 2014;26(1):50-4.

[3]. N S, AA, Srinivas G V, Devi R S. Correlation among lip print pattern, fingerprint pattern and abo blood group. J Clin Diagn Res. 2014 Mar;8(3):49-51.

[4]. Gupta V, Kumar P, Dupare R, Datta SS. Dermatoglyphics and dental caries: a review. Indian J Forensic Odontol 2011;4(4):33-37.

[5]. Suzuku K, TsuchihashiY.New attempt of personal identification by means of lip print. J Indian Dent Assoc 1970;42(1):8-9.

[6]. Wua X, Zhangb D, Wanga K, Huanga Bo. Palmprint classification using principal lines. J Pattern Recognition Soc 2004;37(10):1987-1998.

[7]. Landsteiner K. On agglutination on normal human blood transfusion.1961;1(1):5-8.

[8]. Metgud R, Kaur M, Naik S, Tak A, Patel S. Correlation between Lip Prints and Fingerprints in Gujarati Population – A Forensic Study. J Adv Med Dent Sci Res. 2016;4(3):30-4.

[9]. Misra A, Misra D, Rai S, Dadu M, Khatri M, Mallick P. Crime solvers: A correlative study amongst 500 individuals. MAMC J Med Sci. 2017;3(2):79-86.

[10]. Nandan SRK, Bandaru BK, Santosh ABR, Thankappan P, Chundru NSV, Amudala R. A study on association and correlation of lip and fingerprint pattern analysis for gender identification. J NTR Univ Health Sci. 2015;4(3):176-81.

[11]. Rastogi P, ParidaA. Lip prints- an aid in identification. Australian J Forensic Sci 2011;2(1):1-8.

[12]. Uma Maheswari TN, Gunasundharam N. Role of lip prints in personal identification and criminalization. J Forensic Med Toxicology 2011;12(1):12-21.

[13]. Verma P, Sachdeva SK, Verma KG, Saharan S, Sachdeva K. Correlation of lip prints with gender, ABO blood groups and intercommissural distance. North Am J Med Sci 2013;5(7):427-31.

[14]. Gunasekaran S, Mahabob N, Elangovan S, Lakshmi SJ, Balasubramaniam SK, Rajendran D. Comparative evaluation of lip prints among Indian and African students. Saudi J Forensic Med Sci 2018; 1:14-8.

[15]. Fang L, Leung MKH, Shikhare T, Chan V, Choon KF. Palmprint classification. In: IEEE International Conference on Systems, Man and Cybernetics 2006;2965-2969.

[16]. Debta FM, Debta P, Bhuyan R, Swain SK, Sahu MC, Siddhartha S. Heritability and correlation of lip print, palm print, fingerprint pattern and blood group in twin

population. J Oral MaxillofacPathol. 2018;22(3):451.
[17]. Rekha VR, Sunil S, Rathy R. Heritability and Correlation of Lip Prints and Palmprints in South Kerala Population. Oral MaxillofacPathol J 2015;6(1):544-49.
[18]. Funari W, Janal MN. Cheiloscopy: Lip print Inter-rater Reliability. J Forensic Sci. 2017;62(3):782-5.
[19]. Shivhare PR, Sharma SK, Ray SK, Minj A, Saha K. Dermatoglyphic Pattern in Relation to ABO, Rh Blood Group and Gender among the Population of Chhattisgarh. Int J Sci Stud 2017;4(11):61-65.
[20]. Jatti D, Rastogi P. Digital analysis of lip prints for personal identification: A cross-sectional study in South Indian population. J Indian Acad Forensic Med. 2015;37(3):289-93.