



Original Research Article

Relationship of fingerprint with gender in medical college of Central India

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ABSTRACT

Background: Fingerprint (Dermatoglyphics) is the best tool of identification of any individual which holds as the surest data for identification even in this techno savvy world having various methods of identification. This study was carried out to find out the association between fingerprint and gender determination.

Materials and Methods : This study analyzed fingerprint patterns of 100 participants, with equal gender distribution who are 18–25 years of age. Fingerprints are obtained and classified according to Kucken classification.

Result: We observed the Loop pattern preponderance in overall. Significant variation is found in distribution of pattern of fingerprints in different genders as Loop pattern found is higher in frequency in females compared to males, and Whorl pattern found is higher in frequency in males compared to females.

Conclusion: Fingerprint is an effective tool in gender determination.

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1. Introduction

Fingerprint or Dermatoglyphics is the study of dermal ridges and bridges pattern on volar surface of digits, palm and sole. Development of fingerprint is determined partly by hereditary and partly by environmental and accidental factors which produces tension during the process of development. The ridge pattern of fingers appears between 12 to 16 weeks of intrauterine life and is completed by 24 weeks. The fingerprints are capable of endless variation. It has been hypothesized that there is one chance in sixty-four billion of the two people having identical fingerprint. The two identical twins also have different fingerprints. During the process of ridge pattern formation any disturbances in intrauterine growth which affect the extremity leads to abnormal fingerprint pattern. The disturbances may be due to hereditary or environmental factors.^{1–5}

Fingerprint holds as the surest data for identification even in this techno savvy world having various methods of identification. Fingerprints are now days used to validate presence of individual in many institutes and offices. Dermatoglyphics never change its pattern, unless the finger is mutilated.^{3–10}

2. Aim and Objective

To examine the patterns of fingerprints found in different sexes and to find out the variations in them.

3. Materials and Methods

3.1. Study sample

The study was conducted among 100 participants (50 males and 50 females) of the age group 18–22 years at NKP Salve Institute of Medical Sciences & Research Centre and Lata Mangeshkar Hospital, Nagpur for a period of 2 months. The

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study was approved by Institutional Ethics Committee.

3.2. Methodology

The participants were informed about the purpose of research. Written informed consent for voluntary participation in the research work was obtained from all the participants.

3.3. Procedure

After preparing files for males and females 50 each with name, age, gender, the subjects were asked to clean their hands with tap water and soap and dry them to remove dirt. They were asked to roll their finger bulbs by keeping their arm relax, on forensic fingerprint ink pad in such a way that the ink is applied to tip of finger evenly by rolling the thumb towards the body of subjects and while keeping other fingers out. In the way rolled fingerprints were taken by rolling the fingers on paper from outward to inward in order to obtain an impression of whole finger tip (Ink method by Cummins and Midlo). The procedure was repeated in cases of undesirable prints of fingers. The fingerprint pattern obtained was classified into the loops, whorls, arches and composite form with the help of magnification lens. The ratios were calculated to determine the prevalence of the fingerprint pattern among the gender.

χ^2 test is applied for statistical analysis and differences in the finding in both the sexes was studied with unpaired t-test. SPSS software (version 15.0) was used to analyze the data.

4. Results

We analyzed 1000 prints of 100 participants including all the fingers of both the hands after classifying them according to Kucken classification (Table 1). Some patterns are depicted in Figure 1.

Table 1: Pattern of fingerprints observed

S.No.	Pattern of fingerprints	Number (%)
1	Loops	575 (57.5)
2	Whorls	370 (37)
3	Arches	40 (4)
4	Composite	15 (1.5)
5	Total	1000 (100)

It is quite clear from the above Table 2 that the combined results of both sexes, loop pattern was the commonest (57.5%) followed by Whorls (37%), Arches (4%), and Composite pattern (1.5%).

Similarly, from Table 2, it was also seen that the results of variable distribution of fingerprints in different sexes differ from that of the observed combined results of both the sexes. Loop pattern was found higher in females (70%) than that of males (45%), whereas whorls dominated in

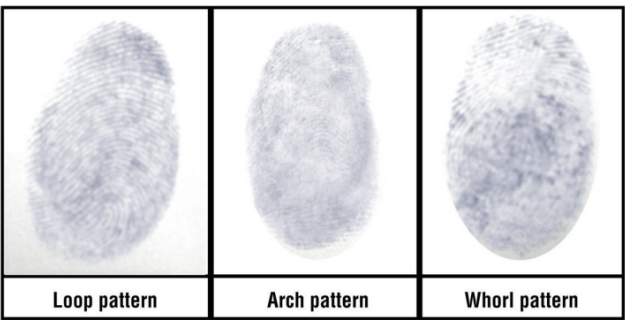


Figure 1: Pattern of fingerprints observed

Table 2: Gender differences in distribution of fingerprints

S.No.	Type of Fingerprint	Males (%)	Females (%)
1	Loop	225 (45)	350 (70)
2	Whorls	253 (50.6)	120 (24)
3	Arches	15 (3)	25 (5)
4	Composites	7 (1.4)	5 (1)
5	Total	500(100)	500 (100)

males (50.6%) in contrast to females (24%). Arches were observed more in females (5%) when compared to males (3%), while composite pattern was very feeble and almost same occurrence in both the sexes.

5. Discussion

Importance of Forensic Medicine lies in personal identification of unknown bodies and in all unnatural deaths including mass disasters. Again identifying the gender is next challenge.¹¹ One of the best methods of identification is Dactylography as the prints do not change throughout the life irrespective of superficial injury.¹² Our result showed that Loop pattern dominated in females whereas the previous study showed the equal distribution in both sexes.¹¹ We found whorls pattern preponderance in male in contrast to Loop pattern preponderance in female. Similar result was observed in a study by Rastogi P et al¹³ and Sam NM et al.¹⁴ Most common pattern seen in present study was loop followed by whorls, arches and least prevalent was composite.

Focusing the discussion on gender difference in finger prints, our study was comparable to study done by Rastogi P et al¹³ done on medical students of Mangalore, showing dominance of loops in females and whorls in males and by Karki RK et al¹⁵ done on students of Kathmandu, while it differs from the study done by Sam NM et al¹⁴ done on South Indians, which shows loops predominance in both the sexes. Female showed arch pattern more than male which was comparable to a study done by Deopa D et al¹⁶ on medical students of Uttarakhand.

6. Conclusion

The most effective tool of identification in medical sciences is Fingerprint System. It's effective in not only identification of individual but also in gender identification. Results of this study are helpful for fingerprint analyzers to help reaching out a specific gender.

7. Source of Funding

None.

8. Conflict of Interest

None.

9. Acknowledgement

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