

STUDY OF FINGERPRINT PATTERNS AMONG MEDICAL STUDENTS IN VIDARBHA REGION, INDIA

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ABSTRACT

“Dermatoglyphics” is the study of epidermal ridge pattern on fingers, palm, and soles. Dermatoglyphics print remains ubiquitous throughout life and form the most reliable criteria of identification. In the present study an attempt has been made to study the fingerprint patterns in medical students of Indira Gandhi Government Medical College, Nagpur. Fingerprint patterns were studied in 140 students, 70 males and 70 females. Dermatoglyphic prints of the fingertips were taken using the ink method by “Cummins and Midlo”. Distribution of dermatoglyphic fingertip patterns were studied in both hands among males and females.

KEY WORDS: Dermatoglyphics, Fingertip patterns, Gender differences.

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INTRODUCTION

The study of epidermal ridge pattern on fingers, palm, and soles is known as “Dermatoglyphics”. The first ever work for dermatoglyphics was done 3000 years ago in China. Harold Cummins first coined the word in 1926. The original ridge characteristics are not disturbed unless the skin is damaged to a depth of about 1 mm [1]. Dermatoglyphics print remains ubiquitous throughout life and form the most reliable criteria of identification. The dermatoglyphic pattern makes their appearance as early as 10 weeks of intrauterine life [2]. Galton classified different fingerprint patterns on the basis of their primary pattern as loops, whorls and arches [3]. Although average distribution of different fingerprint patterns is known worldwide [4], published

literature on the distribution of fingerprint patterns on individual digits are very few. So the present study has been done to know the distribution of fingerprint patterns on different digits in males and females.

MATERIALS AND METHODS

In the present study 140 students were taken, out of which 70 were males and 70 were females. The subjects taken for the study were first year MBBS students of Indira Gandhi Government Medical College, Nagpur. All the subjects were healthy with known blood groups and their age ranges from 17 to 22 years. Written informed consent was taken from the study subjects.

Dermatoglyphic prints were taken by using Ink Method by "Cummins and Midlo " [1]. The materials used were printers, duplicating ink from Kores, ink slab, roller, gauze pads and sheets of paper. The ink was placed on the ink slab and the pad was soaked in it. The ink was evenly spread on the ink slab by roller. Subjects were asked to wash and dry their hands. The fingers were rolled laterally on the ink slab and then placed on a white paper. The fingers were printed by rolling them from radial to ulnar side to include the patterns. Finger tip patterns of all the digits were recorded and studied with the help of magnifying lens. Parameters observed were loops, whorls, arches. The printed sheets were coded with name, age, sex, address.

Table 1 shows the distribution of various fingerprint patterns in right and left hands. From the table it is evident that out of the 1400 fingerprint patterns taken, highest frequency were formed by loops (53.64%) followed by whorls (38.14%) and arches (8.21%). However, percentages of whorls were maximum in ring finger (53.57%) as compared to loops (40.36%) and arches (6.07%). Table 2 shows the distribution of various fingerprint patterns among males and females. In males, overall highest percentages of fingerprint patterns were formed by loops (48.43%) followed by whorls (42.71%) and arches (8.86%). Also, in females highest percentages were formed by loops (59.71%) whereas lowest percentages were by arches (7.86%).

RESULTS

Table 1: Distribution of whorls, loops and arches in right and left hands.

Digits		n	Whorls	%	Loops	%	Arches	%
Thumb	Right	140	63	45	73	52.14	4	2.86
	Left	140	51	36.43	85	60.71	4	2.86
	Right+Left	280	114	40.71	158	56.43	8	2.86
Index	Right	140	57	41.12	61	44.01	22	15.87
	Left	140	59	42.56	55	39.68	26	18.76
	Right+Left	280	116	41.43	116	41.43	48	17.14
Middle	Right	140	33	23.81	93	67.09	14	10.1
	Left	140	43	31.02	83	59.88	14	10.1
	Right+Left	280	76	27.14	176	62.86	28	10
Ring	Right	140	76	54.83	56	40.4	8	5.77
	Left	140	74	53.39	57	41.12	9	6.49
	Right+Left	280	150	53.57	113	40.36	17	6.07
Little	Right	140	32	23.09	100	72.14	8	5.77
	Left	140	41	29.58	93	67.09	6	4.33
	Right+Left	280	73	26.07	193	68.93	14	5
All digits	Right	700	261	37.29	383	54.71	56	8
	Left	700	273	39	368	52.57	59	8.43
	Right+Left	1400	534	38.14	751	53.64	115	8.22

Table 2: Distribution of whorls, loops and arches among males and females.

Digits	Sex	Whorls(%)	Loops(%)	Arches(%)
Thumb (n=140)	M	61(43.57%)	75(53.57%)	4(2.86%)
	F	55(39.29%)	83(59.29%)	4(2.86%)
Index (n=140)	M	63(45.00%)	51(36.43%)	26(18.57%)
	F	52(37.14%)	66(47.14%)	22(15.71%)
Middle (n=140)	M	40(28.57%)	81(57.86%)	19(13.57%)
	F	36(25.71%)	94(67.14%)	10(7.14%)
Ring (n=140)	M	89(63.57%)	45(32.14%)	6(4.29%)
	F	59(42.14%)	69(49.29%)	12(8.57%)
Little (n=140)	M	46(32.86%)	87(62.14%)	7(5.00%)
	F	27(19.29%)	106(75.71%)	7(5.00%)
All digits (n=700)	M	299(42.71%)	339(48.43%)	62(8.86%)
	F	227(32.43%)	418(59.71%)	55(7.86%)

However in males, percentages of whorls in index (45.00%) and percentages of whorls in ring finger (63.57%) were found to be maximum as compared to loops and arches. There was insignificant difference in overall distribution of fingerprint patterns in both hands among males and females.

DISCUSSION

Dermatoglyphic patterns are unique for different individual and remain ubiquitous throughout one's life. Loops form 60-65%, whorls form 30-35% and arches form 5% of the total fingerprint patterns recognised all over the world. Thus,

highest percentages of fingerprint patterns were formed by loops followed by whorls and then arches. Similar percentages of various fingerprint patterns were found in the present study among medical students which coincides with most of the study conducted [5-7].

In present study highest preponderance of loops were present in middle and little finger of both males and females which coincides with the study of Kanchan et al.⁷ Also maximum whorls were seen in ring finger of males partly coinciding with the study of Kanchan et al [7].

Arches were more in index finger of both male and females which is in accordance with the study done on Kanchan et al [7] and British subjects [8].

CONCLUSION

Highest percentages of loops and lowest percentages of arches were found in both male and female medical students.

Highest preponderance of loops was present in middle and little finger of both males and females.

Maximum whorls were seen in ring finger of males whereas arches were more in index finger of both male and females.

Thus, different patterns show preferences for different digits, bilateral variations in the distribution of fingerprint patterns do not occur. No gender-based differences could be established. Similar studies in other population groups were recommended for better correlation.

Conflicts of Interests: None

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