

“A Study of Distribution of Hair on the Phalanges of Toes in Andhra Pradesh.”

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Abstract:

Introduction: Distribution of hair on the phalanges of hands and toes is of anthropological interest. Hair variants are genetically determined. The present study was planned to observe the pattern of hair distribution on the phalanges of toes in Andhra Pradesh using a sample population.

Materials and methods: 700 individuals aged between 18-35 years were randomly selected for the study. The pattern and frequency of hair distribution on the proximal, middle and distal phalanges were studied. Observations were categorized into gender and phalangeal hair patterns.

Observations: Results showed that the proximal phalangeal hair is present in 95% males and 91.1% females. The most common pattern of hair distribution on proximal phalanges is 1-2-3-4-5. Middle phalangeal hair is present in 8% individuals. The most common pattern of hair on middle phalanges is 2-3. Hair is absent on distal phalanges.

Conclusion: The study has anthropological significance in dividing the race, nationalism and sex. Hence it has Medico legal importance too.

Key words: Hair distribution, phalanges, toes, anthropological.

Introduction:

The study of distribution of hair is of anthropological interest. Hair is commonly present on the dorsum of toes. But the distribution of hair on the dorsum of toes may show variations in relation to ethnic groups and race. Hair variants are genetically determined. The presence of hair on greater number of fingers is a dominant feature over presence of hair on lesser number fingers and this trait follows the Mendelian law in its mode of inheritance¹. Complete absence of phalangeal hair is a recessive trait². The distribution of hair on the phalanges may be influenced by certain factors such as gene and environment³. The distribution of hair is governed by a set of alleles – A0, A2, A3 and A4⁴. But there is no available literature concerning the genetic analysis of toe hair pattern in man.

There are several studies on the distribution of phalangeal hair of hands. Very few investigators studied the distribution of hair on the toes – Chaurasia⁵, Setty⁶ and Lian Ming Kang⁷. The literature reveals that there is little or no data available in the distribution of hair on the toes in South Indian population particularly in Andhra Pradesh. Hence the present study has been taken up.

Aims and objectives:

The aim of the present study was to evaluate the different patterns in the distribution of hair on the toes in Andhra Pradesh and to provide a data which may be compared with the other populations to establish regional or racial differences.

Material and Methods:

The study was carried out in the department of Anatomy, NRI Medical College, Chinakakani, Guntur district, Andhra Pradesh from January 2011 to February 2012.

700 subjects aged between 16 – 35 years were randomly selected for the study. 350 were males and 350 were females. All the subjects were native of Andhra Pradesh. Those individuals with skin diseases or foot injuries were excluded from the study. The observations were made in the day light using a hand lens. Name, age and sex of each subject are noted. Presence or absence of hair over the toes is recorded. Data was analyzed statistically.

Observations and Results:

The results are tabulated in the tables 1 to 6. Table 1 shows the distribution of hair on the proximal phalanges of toes in males and females. Proximal phalangeal hair on the toes is observed in 93.1% individuals. There is significant difference in the distribution of proximal phalangeal hair in males and females. Table 2 shows the comparative distribution of hair on the proximal phalanges of right and left toes. There is no much difference in the distribution of proximal phalangeal hair on the right and left toes. Tables 3 and 4, show the distribution of middle phalangeal hair on the toes. Middle phalangeal hair is observed in 8% individuals. Most common pattern in males is 2-3 (3.6%) and in females it is 3 (2.1%). There is no much difference in the distribution of middle phalangeal hair on right and left toes. Tables 5 and 6, shows the distribution of proximal and middle phalangeal hair on each toe. Hair is not observed on the distal phalanges of toes.

Discussion:

In the present study proximal phalangeal hair on the toes is observed in 93.1% individuals (95% males and 91.1% females). This finding differed from the study of Chaurasia ⁵, who reported that proximal phalangeal hair on the toes is present in 55.45% of central Indians. But the finding is close to the observation of Liang Ming Kang ⁶ who reported that proximal phalangeal hair appeared on 350 sides in a study comprising of 205 people. The

common pattern of proximal phalangeal hair in this study is 1-2-3-4-5 (39.5%) and the least common patterns are 1-5 (0.1%) and 2-3-4 (0.1%). The order of frequency of presence of hair on the proximal phalanges is 1>2>3>4>5. There is a significant difference in the frequency of presence of proximal phalangeal hair over 2nd, 3rd, 4th and 5th toes in males and females, where the frequency is more in males (table 5). This finding is similar to that of Liang Ming Kang ⁷. There is no significant difference in the distribution of proximal phalangeal hair on the right and left toes.

In the present study, middle phalangeal hair is present in 8% individuals. The order of frequency of presence of hair over middle phalanges of toes is 3>2>4>5. The distribution of hair on the middle phalanges is of the same order in females, but in males it is 2>3>4>5. The middle phalangeal hair on 3rd toe in central Indians is 8.18% as reported by Chaurasia ⁵, but in this study it is 5.9%. The frequency of presence of middle phalangeal hair on the 3rd toe is more in females (6.1%) than in males (5.7%). The common pattern of middle phalangeal hair on toes is 2-3 (3.4%), followed by 2 (2%) and 3 (1.5%). There is no significant difference in the distribution of middle phalangeal hair on toes in males and females, and on right and left sides.

Hair is not observed on the distal phalanges of the toes.

Conclusion:

The distribution of hair on the phalanges of toes has been investigated in Andhra Pradesh, India among 700 individuals [350 males and 350 females]. Hair is present over proximal phalanges of toes in 95% males and 91.1% females with a common pattern of 1-2-3-4-5. Middle phalangeal hair is present in 8% individuals. The common pattern of middle phalangeal hair in males is 2-3 and in females it is 3. Hair is not observed over distal phalanges. Such studies may be useful because of their anthropological significance in deciding the race, nationalism and sex. Hence it has medico legal importance too.

Table 1: Hair distribution over the proximal phalanges of toes :

Pattern	Males (350x2)	Females (350x2)	Total (700x2)
1-2-3-4-5	314 (44.8%)	240 (34.2%)	554 (39.5%)
1-2-3-4	152 (21.7%)	131 (18.7%)	283 (20.2%)
1-2-3	107 (15.3%)	89 (12.7%)	196 (14%)
1	38 (5.4%)	86 (12.3%)	124 (8.8%)
2	-	3 (0.4%)	3 (0.2%)
1-5	1 (0.1%)	1 (0.1%)	2 (0.1%)
1-2	39 (5.5%)	58 (8.3%)	97 (6.9%)
1-3-4	4 (0.5%)	10 (1.4%)	14 (1%)
2-3	-	4 (0.5%)	4 (0.2%)
3	-	3 (0.4%)	3 (0.2%)
1-4	2 (0.3%)	1 (0.1%)	3 (0.2%)
1-3	6 (0.8%)	4(0.5%)	10 (0.7%)
1-2-3-5	2 (0.3%)	6 (0.8%)	8 (0.5%)
2-3-4	-	2 (0.3%)	2 (0.1%)
Nil	35 (5%)	62 (8.8%)	97 (6.9%)

Table 2: Comparative distribution of proximal phalangeal hair over the right and left toes:

Pattern	Right			Left		
	Males(350)	Females(350)	Total(700)	Males(350)	Females(350)	Total(700)
1-2-3-4-5	154(44%)	119(34%)	273(39%)	160(45.7%)	121(34.5%)	281(40.1%)
1-2-3-4	86(24.5%)	68(19.4%)	154(22%)	66(18.8%)	63(18%)	129(18.4%)
1-2-3	52(14.8%)	41(11.7%)	93(13.3%)	55(15.7%)	48(13.7%)	103(14.7%)
1	19(5.4%)	44(12.5%)	63(9%)	19(5.4%)	42(12%)	61(8.7%)
2	-	3(0.8%)	3(0.4%)	-	-	-
1-5	-	1(0.3%)	1(0.1%)	1(0.3%)	-	1(0.1%)
1-2	18(5.1%)	30(8.5%)	48(6.8%)	21(6%)	28(8%)	49(7%)
1-3-4	1(0.3%)	4(1.1%)	5(0.7%)	3(0.8%)	6(1.7%)	9(1.3%)
2-3	-	1(0.3%)	1(0.1%)	-	3(0.8%)	3(0.4%)
3	-	2(0.6%)	2(0.3%)	-	1(0.3%)	1(0.1%)
1-4	-	1(0.3%)	1(0.1%)	2(0.6%)	-	2(0.3%)
1-3	1(0.3%)	-	1(0.1%)	5(1.4%)	4(1.1%)	4(0.5%)

Table 3: Distribution of hair over the middle phalanges of the toes :

Pattern	Males (350x2)	Females (350x2)	Total (700x2)
2-3	25(3.6%)	13(1.8%)	48(3.4%)
2-3-4	3(0.4%)	11(1.6%)	14(1%)
3	7(1%)	15(2.1%)	22(1.5%)
2	17(2.4%)	12(1.7%)	29(2.07%)
3-4	3(0.4%)	1(0.1%)	4(0.3%)
3-4-5	-	1(0.1%)	1(0.07%)
4	-	1(0.1%)	1(0.07%)
2-3-4-5	-	2(0.3%)	2(0.1%)
Nil	645(92.1%)	644(92%)	1289(92%)

Table 4: Comparative distribution of hair over the middle phalanges of right and left toes :

Pattern	Right			Left		
	Males(350)	Females(350)	Total(700)	Males(350)	Females(350)	Total(700)
2-3	14(4%)	6(1.7%)	20(2.8%)	11(3.1%)	7(2%)	18(2.5%)
2-3-4	1(0.3%)	5(1.4%)	6(0.8%)	2(0.5%)	6(1.7%)	8(1.1%)
3	3(0.8%)	8(2.3%)	11(1.5%)	4(1.1%)	7(2%)	6(0.8%)
2	6(1.7%)	8(2.3%)	14(2%)	11(3.1%)	4(1.1%)	15(2.1%)
3-4	2(0.5%)	-	2(0.3%)	1(0.3%)	1(0.3%)	2(0.3%)
3-4-5	-	-	-	-	1(0.3%)	1(0.1%)
4	-	1(0.3%)	1(0.1%)	-	-	-
2-3-4-5	-	2(0.5%)	2(0.3%)	-	-	-
Nil	324(92.5%)	320(91.4%)	644(92%)	321(91.7%)	324(92.5%)	645(92.1%)

Table 5: Percentage of distribution of proximal phalangeal hair over each toe:

Toe	Males(350x2)	Females(350x2)	Total(700x2)
1	652(93.1%)	631(90.1%)	1283(91.6%)
2	610(87.1%)	530(75.7%)	1140(81.4%)
3	581(83%)	492(70.2%)	1073(76.6%)
4	469(67%)	388(55.4%)	857(61.2%)
5	309(44.1%)	241(34.4%)	550(39.2%)

Table 6: Percentage of distribution of middle phalangeal hair over each toe:

Toe	Males(350x2)	Females(350x2)	Total(700x2)
2	46(6.5%)	35(5%)	81(5.8%)
3	40(5.7%)	43(6.1%)	83(5.9%)
4	5(0.7%)	16(2.3%)	21(1.5%)
5	1(0.1%)	3(0.4%)	4(0.3%)

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