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MIDDLE PHALANGEAL HAIR VARIABILITY AMONG THE SAYYAD AND THE PATHAN OF UTTAR PRADESH

ABSTRACT

Middle phalangeal hair variability in the two groups of Muslims namely, Sayyad and Pathan of U.P. was studied. No significant difference was noted between the Sayyad and Pathan with respect to the middle phalangeal pilosity. Both the populations exhibited the affected incidence most on IV finger which was followed by decreasing frequencies on III, V and II fingers.

Significant increase in the middle phalangeal pilosity between the ages below and above 16 years was recorded.

The Muslims (Sayyad & Pathan) exhibited lowest value of Do as compared to the local Hindu populations of U.P. Compared with their coreligionists, the Muslims (Sayyad & Pathan) revealed difference with the Muslims of Madhya Pradesh, West Bengal, Marashtra and certain parts of Middle East.

INTRODUCTION

Danforth (1921) was a pioneer in demonstrating the hereditary nature of this trait, and suggested that complete absence of hair on the middle segment of the fingers is a simple recessive trait in man. An exception to this rule was, however, found by Matsunaga (1956), and Beckman and Böök (1959). Bernstein and Burks (1942) and Bernstein (1949) extended Danforth's study but concluded that more than a simple Mendelian pair of genes were involved. They put forward an hypothesis of five multiple alleles D_0 , D_1 , D_2 , D_3 , and D_4 — with increasing dominance controlling the inheritance of mechanism of mid-phalangeal pilosity of the digits. The subscripts correspond to the number of finger having mid-phal-

angeal hair. Individuals of the genotype DoDo would have no mid-phalangeal hair.

This genetic trait has recently aroused much interest in view of its value in population variation studies. Many workers in this field have pointed out that there exist striking variation with regard to the middle phalangeal pilosity among different ethnic groups of mankind (Boyd & Boyd 1937, 1941 a; Sewall 1939; Bernstein & Burks 1942; Bernstein 1949; Boyd 1950; Garn 1951; Saldanha & Guinsburg 1961; Dutta 1964 etc.)

Although a considerable amount of data on this character for different ethnic groups are available, yet it has been emphasized that further collection of data on more population groups is essential for assessing its true value in population studies.

The aim of the present paper is to record the distribution of middle phalangeal hair among the two groups of Muslims namely, the Sayyad (Shia) and the Pathan (Sunni) of Lucknow (U.P.). Further an attempt has also been made to elucidate the ethnic affiliations of these two populations.

MATERIAL AND METHODS

A total number of individuals sampled was 300 males, this consists of 150 individuals in each population, viz., the Sayyad and the Pathan. The Sayyad sample was drawn from their principal localities in Lucknow, and the Pathan sample was collected from Malihabad town and its peripheral villages in Malihabad tehsil of Lucknow district of Uttar Pradesh. Maximum care was taken to exclude related persons in both the samples.

For noticing the presence or absence of middle phalangeal hair, the middle segments of the fingers of the subjects were properly cleaned with carbon-

TABLE 1

Distribution of middle phalangeal hair among the Sayyad and the Pathan of Uttar Pradesh

Population	N. Examined	Absence of middle phalangeal hair on both hands		Presence of middle phalangeal hair							
				Rt hand only		Lt hand only		Both hands		Total	
		N.	%	N.	%	N.	%	N.	%	N.	%
Sayyad	150	72	48.00	2	1.33	9	6.00	67	44.67	78	52.00
Pathan	150	55	36.67	5	3.33	5	3.33	85	56.67	96	63.33

$\chi^2 = 3.494, \text{d. f.}, 10 > P > .05$

TABLE 2

Fingerwise and handwise distribution of middle phalangeal hair among the Sayyad and the Pathan of Uttar Pradesh

Finger	Hand	Sayyad (150)								Pathan (150)							
		Absence of middle phalangeal hair		Presence of middle phalangeal hair						Absence of middle phalangeal hair		Presence of middle phalangeal hair					
				Scanty +		Plenty ++		Total				Scanty +		Plenty ++		Total	
		N.	%	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%
II	R	146	97.33	4	2.67	—	—	4	2.67	144	96.00	6	4.00	—	—	6	4.00
	L	144	96.00	6	4.00	—	—	6	4.00	143	95.33	7	4.67	—	—	7	4.67
III	R	114	76.00	20	13.33	16	10.67	36	24.00	96	64.00	21	14.00	33	22.00	54	36.00
	L	114	76.00	17	11.33	19	12.67	36	24.00	98	65.33	22	14.67	30	20.00	52	34.67
IV	R	85	55.33	38	25.33	29	19.33	67	44.67	63	42.00	38	25.33	49	32.67	87	58.00
	L	78	52.00	44	29.33	28	18.67	72	48.00	61	40.67	40	26.67	49	32.67	89	59.33
V	R	127	84.67	17	11.33	6	4.00	23	15.33	108	72.00	30	20.00	12	8.00	42	28.00
	L	123	82.00	19	12.67	8	5.33	27	18.00	108	72.00	32	21.33	10	6.67	42	28.00

+ 5 or less hair
 ++ 6 or more hair

TABLE 3 Combination of fingers with middle phalangeal hair among the Sayyad and the Pathan of Uttar Pradesh

Finger combination	Sayyad						Pathan					
	Right and Left hands combined		Right hand alone		Left hand alone		Right and left hands combined		Right hand alone		Left hand alone	
	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%
O	72	48.00	81	54.00	74	49.33	55	36.67	60	40.00	60	42.00
IV	20	18.67	27	18.00	35	23.33	27	18.00	29	19.33	30	20.00
III-IV	15	10.00	16	10.67	10	6.67	18	12.00	16	10.67	14	9.33
III-IV-V	19	12.67	18	12.00	18	12.00	34	22.67	31	20.67	32	21.33
II-III-IV-V	6	4.00	3	2.00	5	3.33	6	4.00	5	3.33	4	2.67
IV-V	4	2.67	2	1.33	3	2.00	8	5.33	6	4.00	6	4.00
III	3	2.00	2	1.33	3	2.00	—	—	2	1.33	1	0.67
Others	3	2.00	1	0.67	2	1.33	2	1.33	1	0.67	3	2.00
Total	150	100.01	150	100.00	150	100.00	150	100.00	150	100.00	150	100.00
Total number of individuals affected:	78	52.00	69	46.00	76	50.67	95	63.33	90	60.00	90	60.00
Average number of fingers affected:	1.05		0.89		0.95		1.40		1.26		1.25	

tetra-chloride and with the help of a hand lens the number of hair were recorded. In some cases the hair was missing but, the follicle was present and these fingers were classified as having hair.

The presence of hair has been classified into two categories — the scanty, where 5 or less number of hair were present, and the plenty, where 6 or more were present.

To see the age influence on the increase in pilosity of middle phalange the data have been classified into three age groups, namely, 0–16 years, 17 to 35 years, and 36 years and above.

RESULTS AND DISCUSSION

The distribution of middle phalangeal hair among the Sayyad and the Pathan is given in *Table 1*. The frequency of the presence of middle phalangeal hair on one hand or both the hands is 52.00 % in the Sayyad and it comes to 63.33 % in the Pathan. Thus, the Sayyad exhibit less affected incidence as compared to the Pathan. However, the chi-square test of homogeneity reveals no significant difference between the two populations ($X^2 = 3.494$, 1 d.f., $.10 > P > .05$).

Table 2 shows the finger wise and hand wise distribution of middle phalangeal hair among the Sayyad and the Pathan. It is evident that in both the populations IV finger is affected most and less affected fingers in order are III and V. While II finger is least affected. However, between the two populations individual fingers present differences in the incidence of middle phalangeal hair.

No marked bimanual differences are apparent in the incidence of hair on individual fingers in the Sayyad as well as in the Pathan.

When the presence of middle phalangeal hair is seen for quantitative distribution on individual fingers (*Table 2*), it becomes apparent that the plenty hair (6 or more hair) distribution is maximum on IV finger which is followed by III and V fingers. Whereas, II finger lack plenty hair in both the Sayyad and the Pathan. In scanty hair (5 or less hair) the Sayyad exhibit maximum distribution on IV finger which is followed by the incidence on fingers III, V and II, whereas among the Pathan maximum distribution is noted on IV finger which is followed by its occurrence on fingers V, III and II.

It is interesting to point out that IV finger shows maximum incidence of hair, both plenty and scanty, as compared to other fingers in the Sayyad as well as in the Pathan. Furthermore, there are striking differences in the incidence of plenty and scanty hair on individual fingers in both the populations.

Table 3 shows the distribution of middle phalangeal hair on various finger combinations among the Sayyad and the Pathan. It is noted that in almost all the cases where combination of fingers are affected the IV finger is involved. Thus, there are no deviations from combination rule. A low frequency of random combinations have been found. In very few instances a single finger is affected and that is III finger. It is interesting to point out that V and

II fingers are never affected singly in both the populations.

In both the Sayyad and the Pathan, the most frequently observed combination is the presence of middle phalangeal hair on the III, IV and V fingers simultaneously. The other combination worth mentioning is III–V. However, some significant variations in the presence of hair on various finger combinations are apparent between the two populations.

In the Sayyad 52.00 % individuals are affected by middle phalangeal hair and the average number of fingers affected comes to 1.05, whereas in the Pathan 63.33 % individuals are affected and the average of fingers affected is 1.40. Thus, we see that in Pathan the frequency of affected individuals and average of fingers affected is higher as compared to Sayyad.

The distribution of middle phalangeal hair on various finger combinations in the unilaterally affected individuals among the Sayyad and the Pathan has been shown in *Table 4*. It has been observed that most of the unilaterally affected individuals show presence of hair on IV finger or a combination involving IV finger.

Among the Sayyad unilaterally affected individuals are 7.33 % and among the Pathan 6.67 %. A certain percentage of individuals exhibit presence of hair on fingers III and V alone among the Sayyad.

It may be pointed out that among the unilaterally affected individuals, the fingers of the left hand are more affected than the fingers of right hand in the Sayyad, but among the Pathan the fingers of the right and the left hands are equally affected.

Table 5 shows the distribution of middle phalangeal hair on finger combinations identical on both the hands of an individual for the Sayyad and the Pathan. It may be noted that the Sayyad exhibit 78.00 % individuals having identical occurrence of middle phalangeal hair on fingers of both the hands;

TABLE 4
Combination of fingers in unilaterally affected individuals among the Sayyad and the Pathan of Uttar Pradesh

Finger combination	Sayyad				Pathan			
	Left hand free right hand affected		Right hand free left hand affected		Left hand free right hand affected		Right hand free left hand affected	
	N.	%	N.	%	N.	%	N.	%
IV	—	—	5	3.33	5	3.33	4	2.67
III—IV	2	1.33	1	0.67	—	—	—	—
II—IV	—	—	—	—	—	—	1	0.67
III	—	—	2	1.33	—	—	—	—
V	—	—	1	0.67	—	—	—	—
Total	2	1.33	9	6.00	5	3.33	5	3.33

TABLE 5 Symmetry of Right and Left hands with respect to combination of fingers with middle phalangeal hair among the Sayyad and the Pathan of Uttar Pradesh

Finger combinations identical on both the hands of an individual	Sayyad (150)		Pathan (150)	
	N.	%	N.	%
0	72	48.00	55	36.67
IV	23	15.33	16	10.67
III-IV	4	2.67	5	3.33
III-IV-V	14	9.33	26	17.33
II-III-IV-V	2	1.33	3	2.00
IV-V	1	0.67	1	0.67
III	1	0.67	—	—
Total symmetry	117	78.00	106	70.67

TABLE 6

Distribution of middle phalangeal hair in the three age groups among the Muslims (Sayyad, Pathan) of Uttar Pradesh

Age Group	Absence of middle phalangeal hair		Presence of middle phalangeal hair		Total	
	N.	%	N.	%	N.	%
I (0-16 years)	50	54.34	42	45.65	92	100.00
II (17-35 years)	60	37.74	99	62.26	159	100.00
III (36 years and above)	17	34.69	32	65.31	49	100.00

(I X II) $X^2 = 5.482$, *ld. f.*, $.02 > P > .01$
 (II X III) $X^2 = 0.149$, *ld. f.*, $.95 > P > .90$

TABLE 7 Frequency of individuals without middle phalangeal hair in certain populations of India

Population	Area	Male		Female		Investigator
		N.	%	N.	%	
Muslim (Sayyad & Pathan)	Uttar Pradesh	300	42.3	—	—	Present study Srivastava 1966 Singh & Dutta 1955 Bhatnager Personal communication
Srivastava (Kayastha)	Uttar Pradesh	220	51.8	—	—	
Mohiyal Brahmin	Uttar Pradesh	71	56.3	77	59.7	
Pasi	Uttar Pradesh	565	55.4	—	—	
Muslim	Madhya Pradesh	101	49.5	—	—	Dutta 1964
Muslim	West Bengal	203	49.3	12	75.0	Bhattacharjee 1956
Sunni Muslim	Maharashtra	317	53.3	—	—	Basu 1967

N = Sample Size

TABLE 8 Frequency of individuals without middle phalangeal hair in the Muslim populations of certain countries

Population	Area	Male		Female		Investigator
		N.	%	N.	%	
Muslim (Sayyad & Pathan)	U. P. India	300	42.3	—	—	Present study Kayssi (Cited Bhasin 1967) Boyd & Boyd 1931 (Cited Bhasin 1967)
SYRIANS Muslim	Boarij	68	22.1	61	43.3	
Muslim	Meshghara	90	41.9	66	45.5	
ARABS Muslim	Baghdad	233	32.6	133	49.3	Cited Boyd 1950 Cited Boyd 1950 Cited Boyd 1950
EGYPTIANS Muslim	Cairo	228	54.4	203	63.6	
Muslim	Assuit	50	32.0	53	71.7	

N = Sample Size

whereas among the Pathan 70.67 % individuals are bimodally symmetrical. Thus, it may be pointed out that bimodal symmetry with respect to the middle phalangeal hair is more pronounced among the Sayyad.

Many investigators have pointed out that there is age influence on phalangeal pilosity. To confirm the statement, consolidated data of the two samples have been classified into three groups, i.e. 0-16 years, 17-35 years, and 36 years and above, and the results are presented in Table 6. It has been noticed that the percentage of individuals with middle phalangeal hair in the II age group (62.26 %) and the III age group (65.31 %) are more as compared to that of I age group (45.65 %). This suggests that there is an increase in the phalangeal pilosity in the II and III age groups. Significant differences appear between the I and II age groups ($X^2 = 5.482$, 1 d.f., $.02 > P > .01$). However, between II and III age groups the phalangeal pilosity does not differ significantly ($X^2 = 0.149$, 1 d.f., $.95 > P > .90$). Thus, it may be remarked that there is a significant increase in the phalangeal pilosity between the ages below and above 16 years, suggesting age difference and hormonal influence in the middle phalangeal pilosity. This is in conformity with the statements of the earlier investigators in respect of this trait.

The frequency of individuals without middle phalangeal hair in certain populations of India considered for comparison has been shown in Table 7. It is to be noted that the Muslims (Sayyad and Pathan) exhibit lowest value (42.3 %) of Do phenotype as compared to that in the Hindu populations of Uttar Pradesh. It is interesting to point

out that the Muslims (Sayyad & Pathan) come within the range of 41.9 to 56.3 % of upper caste Hindus of Indian sub-continent (Dutta 1966).

The Muslims (Sayyad & Pathan), when compared to their coreligionists residing in different parts of India (Table 7), exhibit lowest frequency of individuals without middle phalangeal hair. Thus, Muslims (Sayyad & Pathan) are found to be distinct from the Muslims of Madhya Pradesh, West Bengal and Maharashtra.

When the Muslims (Sayyad & Pathan) are seen with Muslim populations of Syria, Arabia and Egypt (Table 8), some interesting facts emerge out. The two Syrian samples from different regions present much diversity in the frequency of individuals without middle phalangeal hair. Similar observation is noted for two Muslim samples from Egypt. However, the Muslims (Sayyad & Pathan) with Do 42.3 % are found to exhibit closeness with the Muslims (Males) of Meshaghara Syria (41.9 %). Thus, it may be pointed out that the present study populations in the middle phalangeal hair occurrence do not exhibit a close affinity with the Muslim populations of Middle East from where their ancestors are said to have come.

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