

Original article:

Dermatoglyphics in relation with Blood Groups

A.D.Patil^{1*}, S.M. Sant², S.A. Patwardhan.³

¹Associate Professor, Dept.of Anatomy. B.J.Govt.Medical College , Pune.

²Professor and Head , Dept.of Anatomy. Smt Kashibai Navale Medical College and General Hospital, Pune.

³ Retired Professor and Head , Dept.of Anatomy. B.J.Govt.Medical College, Pune.

Corresponding address : Dr.A. D. Patil^{1*}

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Abstract:

Dermatoglyphics is defined as the specific study of epidermal ridges and their Configuration on the volar aspect of the palmar and plantar regions. This study was carried out to determine relationship of palmar dermatoglyphics with the ABO blood group. The study included 785 medical student of the edge between 18 to 22 years. Finger prints and palm prints were obtained by using the Kore's duplicating ink. The parameters used were total finger ridge count and atd angle. Total finger ridge count and atd angle in all the four blood groups in both male and female shows statistical significant different difference .While atd angle is larger in females than males and total finger ridge count is higher in males than in females.

Key words: dermatoglyphics, TFRC , atd angle , blood groups

Introduction

In the early fetal life the dermal ridge differentiation take place which is genetically determined and influenced by environmental factors. Cummins, H. (1926) [1] postulated that it was the result of physical and topographic growth forces, the tension and pressure in the skin during the early embryogenesis determined the direction of the dermal ridge . The characteristic patterns of epidermal ridges are differentiated in their definitive forms during third (3 rd) and fourth (4 th) month of fetal life [2]. Dermatoglyphics is used in predicting the diagnosis of genetic disorders [3] while a forensic science person uses dermatoglyphy for criminal identification. Landsteiner and Levine, P. (1927) and Levine (1939) led the foundation of the vast knowledge of Rh groups. The distribution of A B O blood groups in Indian population differs from that of Caucasian races. The relative frequency of ABO blood group also shows some appreciable difference from one part of India to another because of the

heterogeneous character of the population. So to find correlation between dermatoglyphics and blood groups present study has been carried out. However there are very few studies on correlation between dermatoglyphics and blood groups. (Otto and Bozoti, 1980[4]; Nayak and Patel, 1973[5], Eswaraiiah G, Bali R S 1977)[6]. Herschel used finger prints for personel identification in India. [7] It is proved that specific diseases are common in particular blood groups ; for example , gastric ulcer in blood group 'A' and duodenal ulcer in 'O' blood group. [8, 9] The present study has been carried out to find the relation between dermatoglyphics and to evaluate their significance. The result of the present study is compare with that if previous workers.

Material and method

The present study has been carried out on 785 healthy individuals (534 males and 251 females). Medical students of age in between (18 – 22 years) were randomly chosen, students suffering from certain disorders or ill were excluded from the

study on the basis of history. The ethical committee permitted to carry out the work using the medical student as subjects. The ABO blood group was selected for the study and individuals were grouped into four blood groups i.e. A, B, AB & O. Dermatoglyphic prints were taken by the "INK METHOD" as described by CUMMINS (1943) [10]. The materials used were Kores duplicate ink.,

plain glass with smooth surface, Ball with handle for uniform application of ink, White paper with glazed surface, Magnifying lens, Pencil, Pen. The prints were analyzed for the following parameters. Total finger ridge count (TFRC) and atd angle were measured

The data was tabulated according to four blood groups and sex. And was analyzed statistically.

Observation

In the present study 785 students were taken out of which 534 were males and 251 were females.

Table – 1. Number of male and female individuals of different blood groups in the present study.

Blood Group	Male		Female		Total	
	NO	%	NO	%	NO	%
A	163	30.52	41	16.33	204	25.98
B	136	25.47	80	31.87	217	27.64
O	194	36.33	89	35.46	283	36.05
AB	41	07.68	41	16.33	81	10.31
Total	534	---	251	-----	785	----

From table -1. It is evident that blood group 'O' is most common in general population and blood group AB the least.

Table - 2 The total number of ridge counts on the finger tips of both hands in male and female individuals.

Blood Group	Male			Female			
	No.	Mean	S.D.	No.	Mean	S.D.	T
A	36385	151.60	5.83	6239	104.00	8.31	P < 0.001
B	27644	138.23	7.56	11377	96.40	8.26	P > 0.001
O	42874	149.90	10.14	13586	104.50	8.23	P < 0.001
AB	8610	148.60	8.42	6154	102.50	6.21	P < 0.001
Total	115818	147.35	---	37356	101.85	---	----

From Table – 2 it can be stated that the total finger ridge count in male is higher than female in different blood groups and also within the blood groups. These differences are statistically significant (P < 0.001) .

From Table – 3 it can be stated that the females are having larger atd angle than males. These differences of atd angle between the blood groups are found to be statistically significant (P < 0.05). The atd angles are measured as summed 'atd' angles.

Table - 3 Showing the percentage frequency if atd angle of both hands in male and female individuals.

Blood Group	Male			Female			
	No.	Mean	S.D.	No.	Mean	S.D.	T
A	13382	82.10	3.58	3571	87.10	3.82	P < 0.005
B	10907	80.20	3.68	6928	86.60	5.12	P < 0.05
O	15966	82.30	5.34	7369	82.80	4.83	P > 0.05
AB	3448	84.10	4.72	3454	84.26	3.43	P > 0.05
Total	43703	82.17	---	21322	85.19	---	----

Discussion

The present study reveals that there is an association between distribution of fingerprint pattern and blood groups. In the present study blood group O is found to be the commonest (36.05%) and AB the least common (10.31%). Similar findings has been reported by Agte,A.V. (1973). However Dapson(1946) found higher incidence of blood group O & A in British population. The same findings were observed by Kshirsager et al (2001)[12] and Mahajan et.al (1986)[13].

1.The total finger ridge count in the present study is higher in males (147.35) than in females (101.85) Similar higher total finger ridge count in males has been reported by Blanka (1976) [11] in his study on North American, individuals (142.90 in males and 120.40 in females).However , between the blood groups and within the blood groups there

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is statistical significance when the total finger ridge count is concerned of the present study.

2. In the present study the summed ‘atd’ angle observed in females (85.19) is larger than the summed ‘atd’ angle read in males (82.17) .Similar higher summed ‘atd’ angles in females has been reported by Sant S.M. (1979)[14] . He observed summed ‘atd’ angle 82.68 in males and 86.20 in females. However, between the blood groups and within the blood groups there is statistical significant difference when the summed‘atd’ angle concerned.

Conclusion

‘atd’ angle is larger in females than males while total finger ridge count is higher in males than in females. ‘ atd ’ angle and total finger ridge count in all the four blood groups in both males and females shows statistical significant difference.

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