

Correlation of Finger Prints with Blood Groups as an Identity Tool

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Abstract

Finger print is the cheapest and user friendly tool of identification. It's correlation with blood group is medicolegally important to trace the victim and accused for detection of crime. In this study thumb prints of 100 medical students of GMC, Latur were taken and correlated with their blood groups. In the study blood group B (39%) was the commonest ABO group, Rh + ve (92%) was commonest Rh system. Amongst the finger print patterns- Loops were most common (64%), whorls were second commonest (31%), the study suggests an association between finger print patterns and blood groups. Blood group B showed more Loops (28%) and blood group A (9%) showed more whorls. Our aim is to help investigating agencies by providing a clue in crime detection by fixing probable culprit. We can find out probable blood group of accused if we find chanced finger print and vice-versa.

Keywords: Finger Print; Unique Identity; Blood Group; Clue for Fixing Probable Culprit.

Introduction

The scientific study of fingerprint is called dermatoglyphics [1]. This is the study of ridge patterns in the skin [2]. It is based on the principle that skin of the balls of the fingers and thumbs is covered with characteristic ridges, the arrangement and distribution of which remains constant and persists throughout life and the patterns of no two hands resemble each other [3]. This system was 1st used in India in 1858, by Sir William Herschel in the Bengal. Sir Francis Galton systematized this method in 1892. Fingerprint Bureau was 1st established in Kolkatta [2]. In Henry system of classification there are three basic fingerprints patterns, loops which constitutes about 60-65%, whorls about 30-35% and arches about 5% [1]. In case of criminals, impressions of all the digits of both the hands are taken and preserved by the police for future identification [3]. Recently in

India Gowda and Rao, in their study on Gowda Saraswat Brahmin community of south Kannada district (Karnataka) reported high frequency of loops with moderate whorls and low arches in the individuals of A, B and O blood groups [4]. Hahne [5] and Herch [6] in their study also found correlation of blood groups and finger print patterns. So, purpose of our study is to correlate blood groups and finger print pattern, when we find a chance finger prints on crime scene than we can find out probable blood group of accused and we can help investigating agencies to solve the crime by fixing probable culprit.

Material and Method

This study was carried out in department of forensic medicine at GMC, Latur. A batch of 100 students was selected for the study. They were asked to press their right and left thumb tips on the ink stamp pad and then to transfer impressions on plain paper sheet and rolled impression obtained by rolling both thumbs [3]. After that their details such as name, age, sex, birthdates, address and blood groups were noted. Their blood groups were confirmed from their college identity cards. Powerful magnifying hand lens were used to differentiate patterns of fingerprints as loops, whorls and arches. This different pattern than correlated with their blood groups

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Observation

Table 1: Distribution of blood group among cases

Blood Group	Cases
A +	18(18%)
B +	39(39%)
AB +	09(9%)
O +	26(26%)
A -	01(1%)
B -	02(2%)
AB -	01(1%)
O -	04(4%)

Table 2: Distribution of finger prints pattern among cases

Pattern of finger prints	Total
Loops	64 (64%)
Whorl	31(31%)
Arch	05(5%)

Table 3: Distribution of blood groups according to sex

Sex	A +	B +	AB +	O +	A -	B -	AB -	O -	Total
Male	10(10%)	21(21%)	03(3%)	08(8%)	01(1%)	01(1%)	01(1%)	03(3%)	48
Female	08(8%)	18(18%)	06(6%)	18(18%)	00	01(1%)	00	01(1%)	52

Table 4: Distribution of finger prints pattern according to sex

Finger Prints pattern	Male	Female
Loops	28(28%)	35(35%)
Whorls	17(17%)	15(15%)
Arches	03(3%)	02(2%)

Table 5: Correlation of blood group and finger prints in male

Sex	A +	B +	AB +	O +	A -	B -	AB -	O -
Loops	04(4%)	14(14%)	03(3%)	07(7%)	00	01(1%)	00	01(1%)
Whorls	06(6%)	05(5%)	00	01(1%)	01(1%)	00	01(1%)	02(2%)
Arches	01(1%)	02(2%)	00	00	00	00	00	00

Table 6: Correlation of blood group and finger prints in female

Sex	A +	B +	AB +	O +	A -	B -	AB -	O -
Loops	05(5%)	14(14%)	04(4%)	01(1%)	00	01(1%)	00	00
Whorls	03(3%)	03(3%)	02(2%)	06(6%)	00	00	00	00
Arches	01(1%)	00	00	01(1%)	00	00	00	00

Table 7: Correlation of blood group and finger prints in general

Sex	A +	B +	AB +	O +	A -	B -	AB -	O -
Loops	09(9%)	28(28%)	07(7%)	08(8%)	00	02(2%)	00	01(1%)
Whorls	09(9%)	08(8%)	02(2%)	07(7%)	00	01(1%)	00	02(2%)
Arches	02(2%)	02(2%)	00	01(1%)	00	00	00	00

Type of Blood Groups (Table 1 and 3)

Majority of cases belongs to B +ve group (39%) followed by O +ve group (26%) and A +ve (18%). Blood group B +ve were most common among males followed by A +ve and O +ve. Blood group B +ve and O +ve were common among females followed by A +ve and AB +ve.

Finger prints patterns (Table 2 and 4).

Loops were commonest pattern of finger prints about (64%), followed by whorls (31%) and arch (5%) among both sex. Correlation of blood groups and finger prints pattern (Table 5, 6 and 7).

Blood group B +ve shows highest frequency of

loops, blood group A +ve shows highest frequency of whorls. Blood group B +ve shows highest frequency of loops, followed by O +ve, followed by A +ve in males and blood group A +ve shows highest frequency of whorls followed by B +ve, followed by O -ve in males. Blood group B +ve show highest frequency of loops, followed by A +ve followed by AB +ve in females. Blood group O +ve shows highest frequency of whorls followed by A +ve and B +ve, followed by AB +ve in females.

Discussion

Finger prints are impressions of patterns formed by the papillary or epidermal ridges of the fingertips. The finger prints are distinctive and permanent in individuals. The fingerprint system is the only guide to identity, which is unfailling in practice [2]. Loops are most common about 60-70 %, followed by whorls about 25-35% and arches about 6-7% [1,2,3] in this study similar results were obtained i.e. loops were 64%, whorls 31% and arches 5%. The results of study by Ahmed Khurshid Pasha et al revealed that blood group B was predominant among the students in order of B>O>A>AB. Blood group B was also most common blood group in both the genders [9]. In this study similar results were obtained i.e. blood group B +ve were commonest amongst both genders, followed by O +ve and A +ve. There is specific correlation between finger prints and different parameters like gender and blood groups [8]. Bharadwaja et al study revealed that individuals with blood group A have more of loops, while that of blood group AB had more of whorls [7]. Dr. Prateek Rastogi et al found that blood group A had a higher frequency of loops but Blood group O was associated with a predominance of whorls [9]. In present study different results were obtained, blood group B +ve shows highest frequency of loops, blood group A +ve shows highest frequency of whorls. This shows

that there was definite correlation between finger prints pattern and blood groups. So by identifying different finger prints we can find out probable blood group of individuals and vice versa, which may help the investigation and detection of crime.

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