

Fingerprint Pattern in the population of Wah Cantt

1. Babur Rashid Chughtai 2. Muhammad Iqbal 3. Azhar Masud Bhatti

1. Prof. of Forensic Medicine, WMC, Wah Cantt 2. Asstt. Prof. of Forensic Medicine, WMC, Wah Cantt
3. Ex-Demonstrator of Forensic Medicine, KEMU, Lahore, DHS, EPI, Punjab & EDO (Health), Gujranwala

ABSTRACT

Introduction: Fingerprinting is the surest method of human identification and identification is the big problem with particular reference to growing terrorism and crime rate in our country.

Objective: To study the fingerprint pattern in the population of Wah Cantt. in connection with the role of fingerprints in identification.

Study Design: Cross sectional and observational study.

Place and Duration of Study: The study was conducted in the population of Wah Cantt. Total duration of study was three months from 01-09-2013 to 30-11-2013.

Material and Methods:

A group of 6 Lecturers were trained to take finger prints from different walks of population of Wah Cantt. The fingerprints were taken on unglazed paper with help of ink pad. The data was scrutinized regarding type of fingerprints. The collected data was analyzed by SPSS version 10.

Results: A total sample of 1000 persons were taken. Among 596 were male and 404 females. The most common type of finger prints remained loops 56.7 % followed by whorls 27.6 %, Arches 8.4% and composites type of fingerprints were detected in 7.3 % persons.

Conclusion: Statistically variations are present in the finger prints as in the population of the whole world.

Key Words: identification, Finger print pattern, Population

INTRODUCTION

Personal Identification means determination of individuality of a person¹. Identification is the most common problem worldwide with particular reference to terrorism and other crimes. Fingerprint Identification is the method of identification using the impressions made by the minute ridges present on the balls of the fingers. No two persons have exactly the same finger prints in the world. There is absolutely no change in this pattern throughout life. It is a surest method of identification of a person². Other personal characteristics are usually changed with the passage of time but finger prints never. It has been calculated that chances of there being an identical finger prints in two persons is about one in 64 billions³. Identification may be complete (absolute fixation of personality) or incomplete (like determination of age, race, sex, and stature etc)⁴.



Figure No.1: 4-types of finger print pattern

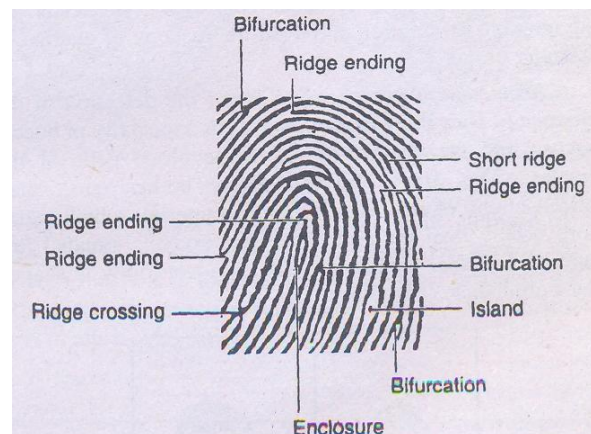
Every contact leaves a trace⁵. Finger prints present on the weapon of offence offer a definite help to identify the culprit. The most valuable evidence that an investigator can obtain from the crime scene is the

finger prints of suspects⁶. In criminal cases fingerprints of all 10 fingers are taken⁷. These skin ridges may be obliterated when skin is removed, damaged or putrefied. According to history of fingerprints, in 1892 the 1st case of murder was resolved with help of finger prints⁸.

Finger prints are broadly divided into four types⁹.

1. Loops
2. Arches
3. Whorls
4. Composites

These broad groups are further subdivided according to difference in pattern of ridges. The following finger prints shows points to be noted during study of finger prints.



Fingerprint Ridge characteristics

To determine the similarities between fingerprints recovered and fingerprints of suspects general pattern of friction ridges along with core, delta ridge ending, bifurcating, length, breadth crossing, branching and presence/absence of islands are analyzed. There are as many as 150 individual ridge characteristics on the average fingerprint¹⁰. 16 points of similarity required before declaring finger prints to be identical. Same number of points of similarities are used by Scotland yard London and FBI (Federal Bureau of Investigation) in USA¹¹. The process of personal identification by studying the pattern of fingerprints is the job of fingerprint Expert.

MATERIALS AND METHODS

A group of 6 lecturers (comprising 3 males and 3 females) belonging to Wah Cantt were trained to get fingerprints from the people belonging to different walks of life. The full fingerprints plain and rolled were taken on the unglazed paper with help of ink pad. Fingerprints of total 1000 persons (males=596 & females= 404) of age 18years and above were taken. The analysis was done regarding type of finger prints (loop, arch, whorl and composite) present in the population of Wah Cantt. The collected data was analyzed by SPSS version 10.

RESULTS

Overwhelming majority belong to loops group of fingerprints present in 567 persons. Among the other groups 276 individuals belong to whorls & 84 finger prints are of arches type. While least common group of fingerprints remained composites present in only 73 individuals. As for as gender is concerned among the out of total 404 females, 219 (54.2%) belongs to Loops, while 118 (29.21%) females have Whorls type, 41 (10.15 %) females belongs to Arches and only 26 (6.44%) belong to composites type of fingerprints. The fingerprint study conducted at Lahore also shows almost the similar results¹².

Table No.1: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.538 ^a	3	.209
Likelihood Ratio	4.506	3	.212
N of Valid Cases	1000		

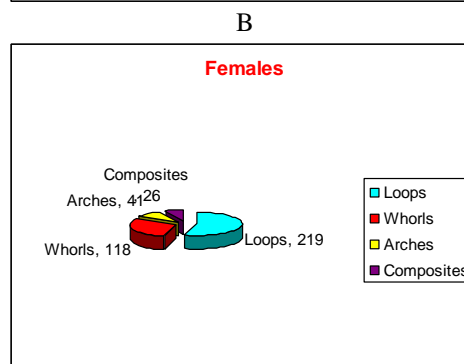
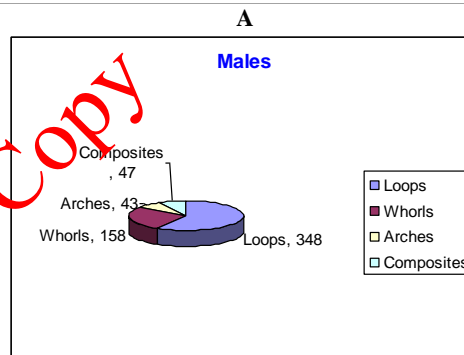
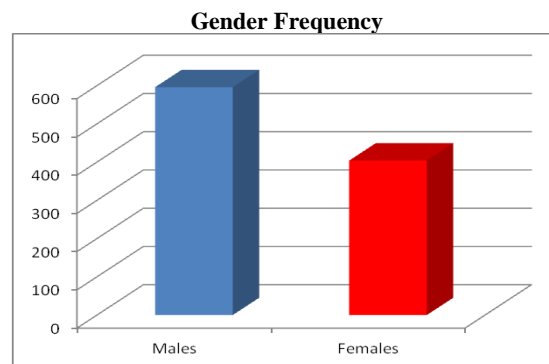
a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 29.49

p-value is 0.209 which is insignificant

Table No.2: Total percentage of fingerprints:

Pattern	Total Numbers	percentage
Loops	567	56.7
Whorls	276	27.6
Arches	84	8.4
Composites	73	7.3

Gender	Male	Female
Total	596	404
Loops	348	219
Whorls	158	118
Arches	43	41
Composites	47	26
Percentage	59.6	40.4



Figures A, B, & c: Male & female pattern of fingerprints

DISCUSSION

The Study of fingerprints, the surest methods of identification, is also called dactylography¹³. Finger prints are complicated pattern of hills and valleys, called ridges and furrows respectively¹⁴. Proliferation of cells in the stratum germinativum forms epidermal ridges which extends into the developing dermis are fingerprints. These ridges appear in the embryo at 10th week and are prominently established by 17th week of

intrauterine life¹⁵. The two features of fingerprints most important for their use as means of personal identification are

1. Every finger print is unique to an individual
2. Finger prints don't change throughout life.

Among the 4 major patterns of fingerprints, the average distribution of pattern of finger prints is as loops about 65%, whorls about 25 % arches about 7 % and composites about 2-3 %.

These patterns of fingerprints are so unique that even identical twins don't have identical finger prints¹⁹. According to presence of fingerprints anywhere, these are divided into three categories.

1. Visible fingerprints
2. Latent fingerprints
3. Plastic fingerprints

Unintentionally we leave our fingerprints on multiple places daily called chance fingerprints. These latent prints are made visible by dusting process or chemicals. Plastic prints are impression of finger prints on gum, newly painted areas, wax, tick dust, soap or clay etc.

A medical person have to work with the collaboration of police. It is the duty of the police to protect the fingerprints of the offender left on scene of crime or weapon. In Scotland fingerprints may be taken as soon as a person is under arrest, but in England they may not be taken before conviction unless with permission or on authority from a Magistrate to whom a Police inspector may apply. This method of identification is also very useful in case of unidentified dead bodies of victims and terrorists etc. Nobody may be allowed to touch any weapon, glass, telephone, furniture, door-knob or handle etc. at the scene of crime before the fingerprints are preserved. However identification of a person may not be possible even with the help of a perfect fingerprint, if the person has never been fingerprinted or his fingerprints are not present in the centralized database; as there is nothing to compare with The FBI maintains fingerprint data of more than 20 million persons¹⁶.

Finder-II (fingerprint reader) is a computerized automatic fingerprint reader system used by FBI of USA which can record each fingerprint data in ½ second. Today fingerprints are used to prevent forged signatures, identify accident victims, verify job applications and provide personalized access everything from ATMs to computer networks and mobile phones¹⁷.

CONCLUSION

Study of pattern of fingerprints needs boarder study to generate exact figures at national level.

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Address for Corresponding Author:

Dr. Babur Rashid Chughtai

Forensic Medicine & Toxicology
Wah Medical College, Wah Cantt.
Mob: 0333-5248613
Office: 051-9314385-89 ext 135
brchughtai@gmail.com