

## Finger Prints Pattern Variation in Diabetic Patients

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### ABSTRACT

**Aim:** To determine the variation of finger prints pattern among Diabetic patients and to support the evidence of court of law regarding identification of persons.

**Study design:** Descriptive study

**Place and duration of study:** Study was conducted at Avicenna Medical College, Lahore and data was collected from the department of Medicine of Avicenna Hospital, Lahore.

**Methods:** Finger prints were collected from the subjects after obtaining their informed consent in the month of June 2013-October, 2013. A total of 100 diagnosed patients of Diabetes Mellitus were selected from the OPD of Avicenna Medical College, Lahore, and data was analyzed at Avicenna Medical College Lahore. Finger prints were recorded on a plain white paper with a stamp pad by plain and rolled method and each finger print was assigned by their Name, Age, Sex, and Blood groups were recorded on the Proforma. **Results:** The majority of the patients were belonging to whorl pattern of finger prints i-e. fifty 50% where as the number of patients belonging to Loop pattern was forty five 45%, composite was only 2,2%, and no any particular patient belonging to Arch pattern.

**Conclusion:** Each fingerprint is unique hence it can be very effectively used as an evidence for identification in the court of law. Majority of the patients was belonging to whorl pattern of finger prints followed by patients belonging to Loop pattern and the least pattern was composite.

**Keywords:** Diabetes, finger prints,

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### INTRODUCTION

Diabetes mellitus is one such disease with a strong genetic basis<sup>1</sup>. It is unanimously recognized, that diabetes, generally, and type 2 diabetes, especially, represents a major threatening of the public health condition worldwide, if considering the epidemic ratios recorded at planetary scale seen as dramatically increasing all over the world<sup>2,3,4,5</sup>. In 2030, it is estimated that the total number of diabetes - affected people will reach 366 millions. This idea is also supported by the fact that, annually, 3.2 million persons die of diabetes, 8,700 die every day, 6 persons every minute, which explains the anticipations provided by World Health Organization (WHO), International Diabetes Federation (IFD),

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European Association for the Study of Diabetes (EASD) and European Diabetes Care Predicators (EURO DIAB) according to which, in the future diabetes will be on the top of the mortality and morbidity causes along with cardio-vascular diseases and cancer<sup>5,6,7</sup>. The type of fingerprint is unique based on the genetical characteristics of each individual. The analysis of the shape of lines on the fingers of hand and foot is called dermatoglyphic. In the recent decades, a considerable improvement has been achieved in the concept of relation between the types of pattern of lines on the fingers and some individual disorders<sup>8,9,10,11</sup>. Genetic predisposition is one of the known risk factors, and studies have been previously done to establish the relation between dermatoglyphic pattern and cardiovascular diseases. Some studies also reports medical literature regarding the relation between dermatoglyphic pattern as an indication of genetic susceptibility in the incidence of Myocardial Infarction<sup>12,13</sup>. Epidermal ridges are formed between 11<sup>th</sup> and 24<sup>th</sup> week of gestation; after this period epidermal ridges do not change<sup>14</sup>. The critical growth of the brain is also occurring during this period. Since the skin and brain develop from the same ectoderm, dermatoglyphics variations are informative for early developmental brain disturbances<sup>15</sup>. There are three basic patterns of finger prints Named Arch, Loop, and Whorl.<sup>16</sup>. The arch type is divided to two subgroups: simple and

tented and the loop type is divided to two subgroups: radial and ulnar<sup>17</sup>. The whorl type is divided to five subgroups as simple, central packed loop, twinned loop, lateral packed loop, and accidental<sup>17</sup>. The pattern area is the part of a loop or whorl which contains the core delta and ridges. Total finger ridges count is the most inheritable feature in dermatoglyphics. The most common pattern, a simple Loop (60-70%) is characterized by single triradius, is not advantageous for tactile perception and precession group. Whorl has two tri radi yielding two central, while simple arches have no true triradi, resulting in zero count<sup>18,19,20</sup>. The importance of dermatoglyphics studies in clinical medicine is that, during development, ridge formation is affected by maternal environment, gene deviants, and chromosomal aberrations. Once formed, they are age and environment stable, becoming a reliable indicator of genetic damage.

## MATERIALS AND METHODS

Finger prints were collected from the patients after obtaining their informed consent in the month of June 2013-October, 2013. A total of 100 diagnosed patients of diabetes mellitus were selected from the OPD of Medicine and data was analyzed at Avicenna Medical College Lahore. Finger prints were recorded on a plain white paper with a stamp pad by plain and rolled method and each finger print was assigned by their Name, Age, Sex, and Blood groups were recorded on the Proforma. Ethical clearance was obtained from the institutional Ethical Committee. The study design was descriptive study. Patients of either sex diagnosed as a case of Diabetes mellitus, belonging to any ABO blood group and any ridge pattern of finger prints were included in the study. Patients suffering from any chronic skin disease s having scars, congenital or acquired anomalies due to trauma on fingers were excluded from this study.

A proforma was designed in which data including name, age, and ABO blood groups were entered. Impression of all fingers and thumbs of both hands were taken. The impressions were taken by simple plain and rolled method. Screening of finger prints were done by using magnifying lens and scanner. Based on this data, the case had been diagnosed by direct supervision of a physician consultant. Finger prints pattern in diabetic patients is an interesting matter and little information is available about this relationship. The objective of this study is to investigate the relationship between the finger print pattern and to support the evidence of court of law regarding identification of persons.

## RESULTS

Analysis in this study was descriptive .A total of one hundred patients participated in this study which were all known case of diabetes mellitus. Out of these one hundred patients the majority of the patients were belonging to whorl pattern of finger prints i-e. fifty 50% where as the number of patients belonging to Loop pattern was forty five 45%, composite was only 2,2%, and no any particular patient belonging to Arch pattern. There is need to develop a detailed and vast study to explore the association of finger print pattern with Diabetic disease. This study offered sensible weighting on distribution of finger print pattern among the diabetic disease patients. Limitations of study were it was only limited to medical OPD patients and Limited only to diabetes mellitus patients.

Pattern of finger prints	n	%age
Arch	--	--
Loop	45	45
Whorl	53	53
Composite	02	02

## DISCUSSION

Dermatoglyphic features are inherited by polygenic system with individual gene contributing a small additive effect. This has been reflected in number of diseases and can be used as a diagnostic aid in screening of genetically transmitted diseases<sup>24</sup>. Identification is a set of individual physical characteristics, functional or psychic, normal or pathological that defines an individual<sup>25</sup>. Dermatoglyphic is a scientific method for anthropological, medico legal and genetic studies<sup>26</sup>. The role of finger printing should not be underestimated and the patterns of finger prints are unique to each and every individual due to their uniqueness they can be used to identify the culprits at crime scene and blast injuries and in mass disaster injuries and as well as for national identification<sup>26</sup>. A number of studies have indicated dermatoglyphic correlation in a large number of genetic disorders, which include diabetes mellitus<sup>27</sup>, Schizophrenia<sup>28</sup>, Congenital heart disease<sup>29</sup> and down syndrome<sup>30</sup>. In present study we have found on one hundred patients the majority of the patients were belonging to whorl pattern of finger prints i-e. fifty 50% where as the number of patients belonging to Loop pattern was forty five 45%, composite was only two,2%, and no any particular patient belonging to Arch pattern. Similar results of Whorl pattern was shown in another study of basic dermatoglyphics of children with diabetes diagnosed under the age of 5<sup>21</sup>. But another study which gives different findings which suggests arch pattern is predominant but we cannot find such

results<sup>22,23</sup>. The reason for such type of result might be due to sampling fluctuation, or the sample size is not adequate, sampling error or these two variables are independent and do not effect each other. Similar studies should be conducted on a larger sample at the National level so as to increase the accuracy of prediction<sup>31</sup>.

## CONCLUSION

- Each fingerprint is unique hence it can be very effectively used as an evidence for identification in the court of law.
- Majority of the patients was belonging to whorl pattern of finger prints followed by patients belonging to Loop pattern and the least pattern was composite.

## RECOMMENDATIONS

- There is a need to evaluate the finger printing in genetical diseases along with familial diseases
- There is a need to establish Finger printing bank for research purpose.
- There should be finger printing pooling in bank of patients especially in genetical and familial disorders.

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