

# Gender Variation of Finger Print Pattern in Coronary Heart Disease patients

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## ABSTRACT

**Aim:** To describe the gender variation of finger prints pattern in Coronary Heart Disease 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 Punjab Institute of Cardiology, Lahore from April 2012 to June 2012

**Methods:** Finger prints were collected from the subjects after obtaining their informed consent in the month of 1 April, 2012 to 15 June, 2012. A total of 140 diagnosed patients were selected from the OPD of Punjab Institute of Cardiology and data were 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, and Sex, were recorded on the proforma.

**Results:** Out of these one hundred and forty patients in males the most common pattern the patients were belonging to whorl pattern of finger prints 37.9%, where as the number of patients belonging to Loop pattern was 27%. The third common pattern was composite, 5%, and very least pattern was arch only 1%. In females most common pattern was Whorl 27% and the second most common pattern was Loop 5.7% and third pattern was composite only 1, and no any arch pattern was found .

**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 patterns were Arch and composite.

**Keywords:** Finger print, coronary heart disease, gender variation

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## INTRODUCTION

Coronary artery disease (CAD) also known as atherosclerotic heart disease<sup>1</sup>, coronary heart disease<sup>2</sup> or ischemic heart disease (IHD)<sup>3</sup> is the most common type of heart disease and cause of heart attacks<sup>4</sup>. The disease is caused by plaque building up along the inner walls of the arteries of the heart, which narrows the arteries and reduces blood flow to the heart. While the symptoms and signs of coronary artery disease are noted in the advanced state of disease, most individuals with coronary artery disease show no evidence of disease for decades as the disease progresses before the first onset of symptoms, often a "sudden" heart attack, finally arises. Symptoms of stable ischaemic heart disease include angina (characteristic chest Pain on exertion) and decreased exercise tolerance. Unstable IHD presents itself as chest pain or other symptoms at rest, or rapidly worsening angina. The risk of artery

narrowing increases with age, smoking, high blood cholesterol, diabetes, high blood pressure, and is more common in men and those who have close relatives with CAD. Other causes include coronary vasospasm<sup>5</sup>, a spasm of the blood vessels of the heart, it is usually called Prinzmetal's angina<sup>6</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>7,8</sup>. Ischemic Heart Disease (IHD) is the most common, serious, chronic, life-threatening illness in the developed world. High fat and energy rich diet, smoking, and a sedentary life-style are associated with its emergence. Obesity, insulin resistance, and type 2 Diabetes Mellitus are powerful risk factors for Ischemic Heart Disease. A substantial increase in Ischemic Heart Disease is projected worldwide, and Ischemic Heart Disease is likely to become the most common cause of death worldwide<sup>7</sup>. Coronary artery disease (CAD) is the most important cause of mortality and morbidity in the world. For example, in the United States, 1.5 million

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people are suffering from myocardial infarction annually out of which 45% of them are under 65 years<sup>8</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>9,10,11,12</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>13</sup> The critical growth of the brain is also occurring during this period. Since the skin and brain develop from the same ectoderm, dermatoglyphic variations are informative for early developmental brain disturbances<sup>14</sup>. There are three basic patterns of finger prints Named Arch, Loop, and Whorl<sup>15</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>16</sup>. The whorl type is divided to five subgroups as simple, central packed loop, twinned loop, lateral packed loop, and accidental<sup>16</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 tri radi, resulting in zero count<sup>17,18,19</sup>.

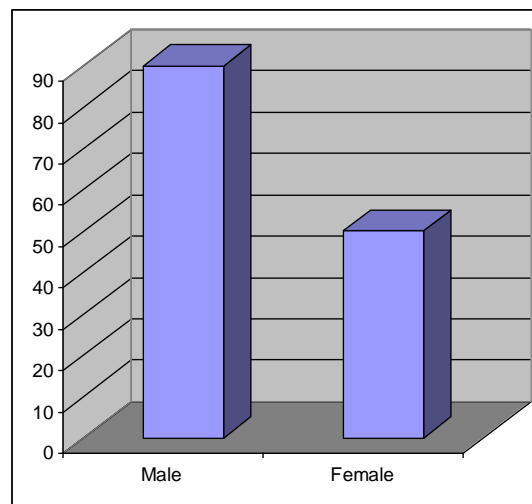
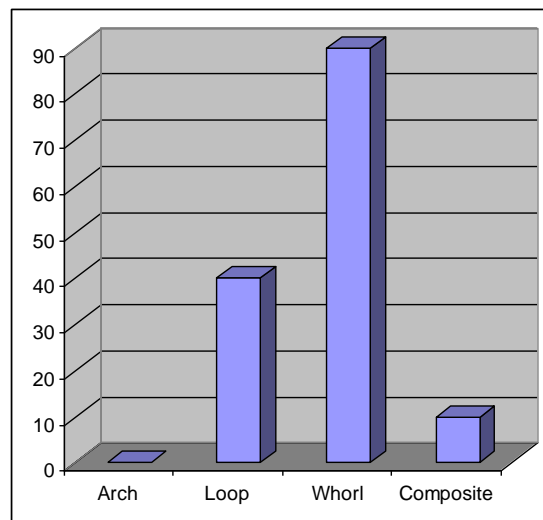
**MATERIALS AND METHODS**

Finger prints were collected from the patients after obtaining their informed consent in the month of 1 April, 2012 to 15 June, 2012. A total of 140 known case of coronary heart disease patients were selected from the OPD of Punjab Institute of Cardiology and data were 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 were recorded on the Proforma. Ethical clearance was obtained from the institutional Ethical Committee and Medical Superintendent of Punjab Institute of Cardiology. The study design was descriptive one. Patients of either sex diagnosed as a case of Coronary artery disease and subjects belonging to and any ridge pattern of finger prints were included in the study. Patients suffering from any chronic skin disease e.g. eczema, leprosy and chronic dermatitis, patients 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 sex 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 cardiologist. The dermatoglyphic pattern in patients with myocardial infarction is an interesting matter and little information is available about this relationship. The objective of this study is to describe the gender variation of finger prints pattern in Coronary Heart Disease patients , and to support the evidence of court of law regarding identification of persons.

**RESULTS**

Pattern



## Sex Variation among the pattern in Coronary Heart Diseases

	Male	Female	Total
Arch	1	1	2
Loop	32	8	40
Whorl	53	38	91
Composite	7	1	8

Analysis in this study was descriptive .A total of one hundred and forty patients participated in this study which were all known case of coronary heart disease. Out of these one hundred and forty patients in males the most common pattern the patients were belonging to whorl pattern of finger prints i.e., 53(37.9%) where as the number of patients belonging to Loop pattern was 38(27%). The third common pattern was composite 7(5%), and very least pattern was arch only 1(1%). In females most common pattern was Whorl 38(27%) and the second most common pattern was Loop 8(5.7%) and third pattern was composite only 1 and no any arch pattern was found . There is need to develop a detailed and vast study to explore the association of finger print pattern with coronary Heart disease. This study offered sensible weighting on distribution of finger print pattern among the Coronary heart disease patients.

## DISCUSSION

Identification is a set of individual physical characteristics, functional or psychic, normal or pathological that defines an individual.<sup>20</sup> Dermatoglyphic is a scientific method for anthropological, medico legal and genetic studies.<sup>21</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>21</sup> A number of studies have indicated dermatoglyphic correlation in a large number of genetic disorders, which include diabetes mellitus<sup>22</sup>, Schizophrenia<sup>23</sup>, Congenital heart disease<sup>24</sup>, and down syndrome<sup>25</sup>. Coronary artery disease is the most important cause of mortality and morbidity in the world<sup>16</sup>. In our study we found Out of the one hundred and forty patients , in males the most common pattern the patients were belonging to whorl pattern of finger prints i-e. 53, 37.9% where as the number of patients belonging to Loop pattern was 38, 27%.. The third common pattern was composite 7,5%, and very least pattern was arch only 01,1%. In females most common pattern was Whorl 38,27% and the second most common pattern was Loop 8, 5.7% and third pattern was composite only 1,and no any arch pattern was

found . 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 , further limitations of study was it was only limited to Punjab Institute of Cardiology OPD patients and Limited only to ischemic Heart disease patients. The study was considered on small and selected area, if it will be conducted on Nationwide on larger scale findings might be different Similar studies should be conducted on a larger sample at the National level so as to increase the accuracy of prediction<sup>26</sup>. A study by Rashad M.N on Japanese subjects, showed individuals with which shows significantly higher frequency of true whorls and correspondingly lower frequency of Ulnar Loop than the control may be supported the same<sup>27</sup>. Whereas another study done in Karachi, whorl pattern is predominant 48% followed by Loops 42.5% and then Arches 4.8% which is similar to the study done in India<sup>26</sup>. Finger print patterns are related to genetic predisposition to various disorders<sup>26</sup>.

## CONCLUSION

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

## Recommendations:

Similar studies should be conducted on a larger sample at a National level so as to increase the accuracy of prediction. There is a need to evaluate the finger printing in genetical diseases along with familial diseases. There is a need to utilize NADRA fingerprinting data bank for research purpose. There should be finger printing data bank of patients especially in genetical and familial disorders in hospitals for research purpose.

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