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RESEARCH ARTICLE

STUDY OF FINGERPRINT PATTERN IN KASHMIRI POPULATION

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Abstract

Background: Dactylography/Dactyloscopy/Dermatoglyphics is the study of fingerprints as a method of identification. Fingerprint is an easily available, accurate and authentic method of identification. Importance of fingerprints is of immense use in forensic, and criminal application. Nowadays the subject is also developing importance in various other fields as well. A

Aim: To identify the fingerprint pattern and its relation with gender in Kashmiri population.

Material and Method: A cross-sectional study was done in the government chest disease hospital. The subjects were the staff of the department belonging to various regions and districts of Kashmir. The subjects were asked to press their fingers on the stamp pad and then transferred to the paper.

Result: Loops were the most common pattern found followed by whorls and arches. Loops were found in 53.8%, whorls in 39.5% and arches in 6.7%. In gender-wise distribution a higher percentage of loops was found in females and whorls in males.

Conclusion: In the current research work different types of fingerprint patterns were found. Fingerprint is an easily available and effective method of identification of a person. This study will prove helpful to experts in solving criminal cases, identifying missing persons or in case of a disaster.

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Introduction:-

A finger print is an impression by the ball of the fingers. Dactylography (finger print system) is based on the principle that the skin of the balls of the fingers and the thumb is covered with characteristic ridges and grooves. The pattern of these ridges and grooves helps in the identification of an individual as this pattern is specific to every individual. The use of finger print system has been of great significance in forensic and criminal identification. Dactylography/Dactyloscopy/dermatoglyphics is the study of finger prints as a method of identification (1). The word Dactylography is derived from two Greek words, daktylos meaning finger and graphein meaning to write (2).

The fingerprint patterns are formed during gestation and are present at birth both on dermis and epidermis (3). The finger prints and palmer prints are developed during 10th week of intrauterine life and are fully developed at around 24 weeks of gestation (4).

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Today the uses of dermatoglyphics are expanded and it is being used in personal identification, anthropology, genetics, and research purpose and as an important tool in the diagnosis of various diseases. Harold Cummins first coined the term Dermatoglyphics in 1926 and explained the existence of characteristic dermatoglyphic features associated with Down's syndrome (5).

Finger prints are easy to access, remain same throughout the entire lifetime of an individual and remain unaltered except due to the destruction of the true skin. No two finger prints are alike not even in the identical twins. The finger print patterns are classified on the basis of arrangement of ridges into four main types viz loops, whorls, arches and composite or compound. The loop pattern is the most common pattern.

Aim of the study:-

To study/identify the fingerprint pattern and its relation with gender in Kashmiri population.

Material And Methods:-

A cross sectional study was done in the government chest disease hospital Srinagar. The subjects were the staff of the department. They belonged to various districts and regions of Kashmir valley. Informed written consent was taken from all the subjects participating in the research work. The subjects belonged to different age groups ranging from 25 to 50 years of age. The subjects with scars, injury or any other skeletal deformity were excluded from the study. The procedure was explained to every subject. They were asked to wash their hands with soap and water and then dry them up with the help of a disposable tissue. The participants were then asked to press the finger tips over the ink pad to spread the ink evenly. The thumb is rolled towards the body and the other fingers are rolled away from the body. A rolled impression is taken by rolling inked finger from side to side. This is the thumb in and the finger out method. The finger prints of all the ten digits of both the hands were taken in the same way. Caution was taken in order to avoid the smudging of finger prints. Name, age and sex of every subject was taken and a serial number was assigned to them. The finger prints were examined with the help of a magnifying lens. The different patterns were recorded as loop, whorls, arches and composite based on the pattern of ridges. The frequency of each finger print pattern was tabulated and its percentage was calculated.

Results:-

A total of 100 subjects were included in the study. The subjects belonged to various districts of Kashmir. In the study 50 subjects were males and 50 subjects were females. Finger print pattern was studied in all the ten digits of both of both the hands accounting to a total of 1000(100x10).The fingerprint pattern encountered in this study were loops, arches and whorls. Loops were the most common pattern found in 538 (53.8%) of specimens followed by whorls in 395 (39.5%) and arches in 67 (6.7%).

Table 1:-

Table 1:- shows the combined finger print pattern in males and females.

S.no	Finger print pattern	Number (percentage)
1	Loops	538 (53.8)
2	Whorls	395(39.5)
3	Arches	67(6.7)
4	Total	1000 (100)

Table 2:- shows the finger print pattern in males and in females and their percentage.

S.no	Type	Males (%)	Females (%)
1	Loops	190(38)	348(69.6)
2	Whorls	272(54.4)	123(24.6)
3	Arches	38(7.6)	29(5.8)
4	Total	500(100)	500(100)

In this study whorls was the most common fingerprint pattern found in 54.4% and in females loops was found in highest number of 69.6%.

Discussion:-

Finger print system as a method of identification has gained enormous surge in the recent years due to security reasons and biometry purpose because of its authenticity. Apart from that by studying the finger prints we can relate, evaluate and obtain a prior knowledge about the association between various patterns and clinical conditions associated with them. It helps in the prevention at an early stage. Moreover finger prints are considered to be a legitimate proof in the court of law worldwide.

Depending upon the information available from various types of finger prints it can be used to process its identity with gender, age and ethnicity. We conducted this study to study the finger print patterns in north Indian population.(kashmir division/kashmiri population).The finger print patterns found in our study were loops, arches and whorls. We did not find any composite pattern in our study. Composite consists of two or more patterns combined together. The most common pattern found in our study was loops and the least was arches. In gender wise distribution we found the loop pattern was also more common in females and whorls was the common pattern found in case of males. The distribution of loops, whorls, arches and composite is approximately 65%, 25%, 7% and 2-3% respectively (6).

In our study loops were present in 53.8% followed by whorls in 39.5% and arches found in 6.7%.Composite pattern was not found in our study. In a study conducted by Rajiv Ranjan Sinha(7) loops were found in 57%,whorls in 30.2%,composite was found in 6.7% followed by arches being the least common found in 5.8%.Another study conducted by Karki RK,Singh PK(8) found loops in 62.10%,whorls in 29.55% and arches in 8.35%.Gangadhar MR,Rajashekara Reddy.K(9) in his study reported the loop pattern in 57.11%,whorls in 27.89% arches in 15% of the general .All these finding are comparable with our study.

Considering the sexual difference in finger prints our study shows higher percentage of loops in females and of whorls in males and it is comparable with a study done by Karki RK,Singh PK(8) which shows loops are more frequent among females and whorls among males.It differs from a study done by Nithin V(10) reporting the most frequent pattern as loops in the total population as well as in gender wise distribution.Thus there is an association between the distribution of fingerprint pattern and gender and prediction of gender can be made possible based on the fingerprint patterns(11)

Conclusion:-

In the current research work different types of fingerprint patterns were found. Fingerprint is an easily available and effective method of identification of a person. This study will prove helpful to experts in solving criminal cases, identifying missing persons or in case of a disaster.

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