

## Dermatoglyphics Pattern in Hypertensive Patients

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### ABSTRACT

**Objective:** To determine the variation of Dermatoglyphics pattern in Hypertensive patients and to support the evidence of court of law regarding identification of persons.

**Study design:** Observational Descriptive study

**Place and duration of study:** Study was conducted at Avicenna Medical College, Lahore and data were collected from the Punjab Institute of Cardiology, Lahore from April 2012 to June 2012

**Materials and methods:** Finger prints were collected from the subjects after obtaining their informed consent from month of April 2012 to June 2012. A total of 100 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, Sex, and Blood groups recorded on the Proforma. Ethical clearance and permission was obtained from the institutional Ethical Committee of Avicenna Medical College, Lahore and Medical Superintendent of Punjab Institute of Cardiology.

**Results:** The majority of the patients were belonging to whorl pattern of finger prints i.e., Sixty seven (67%) where as the number of patients belonging to loop pattern was twenty eight (28%) and pattern of composite was five (5%) only and no any patient of 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 were belonging to whorl pattern of finger prints followed by patients belonging to Loop pattern and the least pattern was composite.

**Key words:** Hypertension, dermatoglyphics,

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### INTRODUCTION

The analysis of the shape of lines on the fingers of hand and foot is called dermatoglyphic. The type of fingerprint is unique and based on the genetical characteristics of each individual. 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>1,2,3,4</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<sup>5</sup>. Essential hypertension is a condition with genetic influence. It is defined as sustained high blood pressure not attributable to a single cause but reflecting the interaction of -multiple genetic and environmental influences, such that siblings of hypertensive parent or parents stand a higher chance of developing hypertension in later life. Blood pressure depends on a combination of two factors:

(a) how forcefully the heart pumps blood around the body (b) how narrowed or relaxed the arteries are. Hypertension occurs when blood is forced through the arteries at increased pressure<sup>6</sup>. Dermatoglyphics had proved to be a very important tool used for the identification of most gene-linked abnormalities or diseases. A number of studies have shown dermatoglyphic correlation with a large number of genetic disorders<sup>7;8;9;10;11;12;13;14</sup>. The variables implicated include digital patterns, ATD angle, DAT angle, digital ridge, A-B palmar ridge counts, palmar crease pattern<sup>12;14</sup>. Since essential hypertension is one of the most common disease in the world affecting an estimated 20 percent of adult population and it is associated with high risk of morbidity and mortality. It is therefore important to develop methods for early diagnosis of individuals who are at risk. The use of dermatoglyphics as presented in this work is a unique approach for early identification of such individuals, since dermatoglyphic patterns are established in utero<sup>15</sup>. In study they examined how finger and palm prints are related to fetal growth and adult blood pressure (primary hypertension) living in Lancashire. They found that individuals who were thin at birth had more whorl patterns on their fingers. People who were short at birth in relation to their head circumference had longer hands and a

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narrower palmer angle<sup>16</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 through out the life<sup>17</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>18</sup> hence these epidermal ridges could be used to indicate gene or chromosomal abnormalities<sup>19</sup>. There are three basic patterns of finger prints Named Arch, Loop, and Whorl<sup>20</sup>. The arch type is divided to two subgroups: simple and tented and the loop type is divided into two subgroups: radial and ulnar<sup>14</sup>. The whorl type is divided to five subgroups as simple, central packed loop, twinned loop, lateral packed loop, and accidental<sup>14</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>21,22,23</sup>.

**MATERIALS AND METHODS**

Finger prints were collected from the patients after obtaining their informed consent from month of April, 2012 to 15 June, 2012. A total of 100 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 plain white paper with stamp pad by plain and rolled method and each finger print was assigned by their Name, Age, Sex, and Blood groups recorded on the Proforma. Ethical clearance and permission was obtained from the institutional Ethical Committee of Avicenna Medical College, Lahore and Medical Superintendent of Punjab Institute of Cardiology. The study design was Observational descriptive study.

**Inclusion criteria:**

1. Patients of either sex diagnosed as a case of Hypertension, Lahore.
2. Subjects belonging to any ABO blood group
3. Subjects belonging to and any ridge pattern of finger prints

**Exclusion Criteria**

1. Patients suffering from any chronic skin disease e.g. eczema, leprosy and chronic dermatitis.
2. Patients having scars, congenital or acquired anomalies due to trauma on fingers
3. Patient not diagnosed as case of Hypertension.

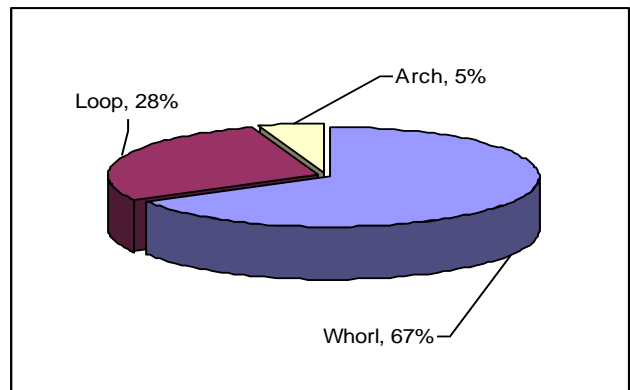
A proforma was designed in which data including name, age, and ABO blood groups were entered. Impression of all fingers and thumbs of both hands were taken. The impressions were taken by simple plain and rolled method. Screening of finger prints were done by using magnifying lens and scanner. Based on this data, the case had been diagnosed by direct supervision of a cardiologist. The dermatoglyphic pattern in patients with hypertension is an interesting matter and little information is available about this relationship. The objective of this study is to investigate the relation between the dermatoglyphic 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 Hypertensive disease. Out of these one hundred patients the majority of the patients were belonging to whorl pattern of finger prints i.e., sixty seven (67%) where as the number of patients belonging to Loop pattern was twenty eight (28%) and pattern of composite was five (5%) only and no any patient of arch pattern was found.

Pattern of finger print	=n	%age
Arch	-	-
Loop	28	28
Whorl	67	67
Composite	05	5

Pattern variations in hypertensive patients



## DISCUSSION

Dermatoglyphic is a scientific method for anthropological, medico legal and genetic studies<sup>24</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>24</sup>. A number of studies have indicated dermatoglyphic correlation in a large number of genetic disorders, which include diabetes mellitus<sup>7</sup>, Schizophrenia<sup>25</sup>, Congenital heart disease<sup>10</sup>, down syndrome<sup>12</sup> and hypertension<sup>30</sup>. In our study we found Out of these one hundred patients the majority of the patients were belonging to whorl pattern of finger prints i.e., sixty seven 67% where as the number of patients belonging to Loop pattern was twenty eight 28% and pattern of composite was five 5% only and no any patient of arch pattern was found. The reason for such type of result might be due to Limitations of study which was only limited to Punjab Institute of Cardiology OPD patients and Limited only to Hypertensive heart disease patients. The study was conducted on small and selected area, if it will be conducted on Nation wide, elaborative that will be more beneficial and more accurate on larger scale findings which might be different and elaborative. Sampling fluctuation, or the sample size inadequate, sampling error or these two variables being independent, not affect each other. <sup>26</sup>. A study on coronary heart disease supports the same results<sup>27</sup>. An other study on Japanese subjects, showed that individuals which showed significantly higher frequency of true whorls and correspondingly lower frequency of Ulnar Loop than the control may be supported by the same<sup>28</sup>. Where as another study done in Karachi, whorl pattern is predominant 48% followed by Loops 42.5% and than Arches 4.8% which is similar to the study done in India<sup>29</sup>. An other study of Hypertension on river indigenes patients of Nigerian peoples showed the same results.<sup>30</sup> Finger print patterns are related to genetic predisposition to various disorders<sup>27</sup>.

## CONCLUSION

The findings of the study can be concluded as follows:

1. 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.

2. Each fingerprint is unique hence it can be very effectively used as an evidence for identification in the court of law.

**Recommendations**<sup>26</sup>: Similar studies should be conducted on a larger sample at a National level so as to increase the accuracy of prediction.

1. There is a need to evaluate the finger printing in genetical diseases along with familial diseases
2. There is a need to establish Finger printing bank for research purpose.
3. There should be finger printing pooling in bank of patients especially in genetical and familial disorders.
4. There is need to develop a detailed and vast study to explore the association of finger print pattern with Hypertensive patients. This study offered sensible weighting on distribution of finger print pattern among the hypertensive patients.

## REFERENCES

1. Shamsoddini S, Masomi M, Nagad-Hossini M. Relation between the lines on the fingers of hand and the incidence of disease in human. *Scientific Journal of Kerman Medical Science University* 1997; 4(3): 136-142.
2. Simsek S, Taskiran H, Karakaya N et al. Dermatoglyphic analysis in children with CP. *Neurobiology-BP*. 1998; 6(3): 373-380.
3. Varma SL, Chary TV, Singh S, Ashorom Z. Dermatoglyphic patterns in schizophrenic patients. *Acta Psychiatr-second* 1995; 91(3): 213-215.
4. Drongowki RA, Coran AQ. Dermatoglyphic patterns in children with chronic constipation. *Dig Dis Sci* 1995; 40(7): 142.
5. Robert R, Doing M. Pathophysiology: Recognition and treatment of acute MI in: schlond RC and wagene Alexander R(Eds). *Hurst's the Heart* 8th ed 1994; pp: 1107-1108.
6. Neal Uren and Dan Rutherford, 2004. High blood pressure, <http://metdoctor.com>.
7. Shield, J.P., E.J.H. Wadsworth, J.D. Baum, 1995. Dermatoglyphics Fetal Growth and Diabetes in children. *Archives of Diseases in Childhood*, 72: 159-160.
8. Oladipo, G.S. and B.M. Ogunnowo, 2004. Dermatoglyphic patterns in Diabetes Mellitus in South Eastern Nigeria Population. *African Journal of Applied Zoology and Environmental Biology*, 6: 6-8.
9. Oladipo, G.S., I.U. Gwunireama and J. Ichebo, 2005. Dermatoglyphic Pattern of Schizophrenics in South Nigeria Population. *J. Biomed Africa*, 8(2): 27-31.
10. David, J.J., 1981. Dermatoglyphics in Congenital heart diseases. *Journal of medical Genetics*, 18: 344-349.
11. Oladipo, G.S. and E.B. Akanigha, 2005. Dermatoglyphic Patterns in Androgenic Alopecia in a South Eastern Nigeria Population. *Journal of experimental and clinical Anatomy*, 4(2): 44-47.

12. Borroface, R.A., 1978. Down's Syndrome in Nigeria: Dermatoglyphic Analysis of 50 cases: Nigeria Medical Journal, 8: 571-576.
13. Oladipo, G.S. Olotu Joy, H.B. Fawehinmi, P.O. Okoh and A.D. Iboroma, 2007. Dermatoglyphic patterns in Idiopathic (primary) dilated cardiomyopathy, in south southern Nigeria. Scientific research and essay, 2 (10):416-420.
14. Jalali, E. and K.W. Hajian-Tilaki, 2002. Dermatoglyphic patterns in patients with myocardial infarction. *Acta Medical Iranica*, 40(3): 187-191.
15. Schaumann, B. and M. Alter, 1983. Dermatoglyphics in Medical disorder oxford monograph on medical Genetics. Hartnoll print, Bodmin, Cornwall, UK pp: 146-172.
16. Godfrey, K.M., O.J. Barker, Peace J., Cloke and C. Osmond, 1993. Relation of fingerprints and shape of Palm to fetal blood pressure, *BMJ.*, 14:307(6901):405-409.
17. Babler W. Embryonic development of epidermal ridges and their configurations In: Platocc, Garruto RM, Schaumann BA, editors 1991; *Dermaoglyphics: Science in Transition Birth defects*. Original article series; Vol 27. Wiley-liss, New York, pp.95-112.
18. Van O el CJ, Baare WF, HUlshoff POT HE, Haag J, Balazs J, Dingemans A et al. Differentiating between low and high susceptibility to Schizophrenic in twins: the significance of dermatoglyphic indices in relation to other determinants of brain development. *Schizophr Res* 2001;52:181-93
19. Ravinda, R., I.M. Thomas, 1995. Finger ridge count and finger print pattern in maturity onset of diabetes mellitus. *Indian Journal of Medical Science*, 49: 153.
20. United states Department of Justice FBI (US). The scene of finger prints, Classification and uses. Us Government Printing Office; 1984.
21. Schauman B, Alter M, editors, *Dermatoglyphics in medical disorder*, Springer Verbiage. New York: Heidelberg, Berlin ; 1976.
22. Martin NG, Eaves U, Loesch DZ. A genetical analysis of co variation between finger ridge count. *Am Hum Biol* 1982;9:539-52.
23. Bank Sd, Pa DIP, Mukerjee DP. Finger Dermatoglyphic variations in Rengma Nagas of Nagaland India. *Coll. Antropol* 2009;33:31-5
24. Qudsia Hassan, Ghulam Mustafa Yousufani, Muhammad Ishaq, Mudaser Hussain Abbasi, Comparative study of Dermatoglyphic among the students of Ziauddin University. *Med. Forum*, Vol.22, No.12. December, 2011.
25. Jim Van-Os J, woodruff PW, Fananas L, Ahmad F, Shurique N, Howard R, Murrar RM (2000). Association between cerebral structural abnormalities and dermatoglyphic ridge count in schizophrenia. *Compr. Psychiatry*. 41(5):380-4
26. Mudaser Hussain Abbasi, M. Amin Mengal, Rana M. Akhtar Khan et al. Comparative study of dactylography among the students of Avicenna Medical College Lahore. *PJMHS* Vol.6 No.2 Apr-Jun 2012 362-365.
27. M. Amin Mengal Mudaser Hussain Abbasi, Rana M. Akhtar Khan et al. Dermatoglyphics pattern in patients with Coronary Heart disease, Lahore. *PJMHS* Vol No. July-Sept 2012.
28. Rashad MN. Dermatoglyphic trait in patients Cardiovascular disorders. *Am J Phys Anthropol*. 1975; 42(2):281-283.
29. Rastogi P, Pillai KR, A study of finger prints in relation to gender and blood group. *J Indian Acad Forensic Medi* 2010;32:11-13.
30. Oladipo, G.S (PhD); Osogba, I.G (BSc); Bobmanuel, I (BSc); Ugboma, H.A.A (Fics); Sapiro, M.K (fwacs), Ekeke, O.N (fwacs) et al "Palmar Dermatoglyphics in Essential Hypertension Amongst Rivers Indigenes" *Australian Journal of Basic and Applied Sciences*, 4(12): 6300-6305, 2010, ISSN 1991-8178.