

Gender Variation of Dactylographic Pattern in Hypertensive patients

MUDASER HUSSAIN ABBASI¹, ABDUL GHANI KORAI², YASER AMEER³, YASIR ALI BHATTI⁴, RANA MUHAMMAD AKHTAR KHAN⁵, HAROON HABIB⁶, SALAHUDDIN⁷, MUHAMMAD ZUBAIR KHAN⁸, HASAN JAVED⁹, ALI RAZA¹⁰

ABSTRACT

Aim: To determine the variation of fingerprinting 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 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 April, 2012 to June, 2012. A total of 113 diagnosed patients were selected from the OPD of Punjab Institute of Cardiology 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., sixty five 65% 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 was belonging to whorl pattern of finger prints followed by patients belonging to Loop pattern and the least pattern was composite.

Keywords: Hypertension, fingerprinting, court of law

INTRODUCTION

Essential hypertension (EH), defined as chronically elevated blood pressure (BP) occurring in the absence of other predisposing conditions, affects >25% of adults worldwide and is a significant risk factor for coronary heart disease, stroke, and renal disease¹. More than 30 genomewide linkage studies of EH and BP-related phenotypes have been published), by use of a variety of study designs and populations^{2,3}. Nevertheless, several genomic regions, such as 1q, 2p, 3p, 6q, 7q, 12q, 15q, 17q, 18q, and 19p, were validated by multiple studies and are likely to contain EH-susceptibility loci. These linkage regions, typical of complex traits, contain hundreds of genes³. It is difficult to decide which linkage regions warrant costly gene identification³. Genes play a major role in determination of BP and EH susceptibility, because the heritability of BP levels has been estimated to be 30%–35%⁴. 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 pressure⁵. Genetic predisposition is one of the known risk factors, and studies have been previously done to establish the relation between dermatoglyphic pattern and cardiovascular diseases⁶. 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 disorders⁷⁻¹⁰. These Epidermal ridges are formed between 11th and 24th week of gestation; after this period epidermal ridges do not change through out the life¹¹. 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 disturbances¹². Hence these epidermal ridges could be used to indicate gene or chromosomal abnormalities¹³. There are three basic patterns of finger prints Named Arch, Loop, and Whorl¹⁴. The arch type is divided to two subgroups: simple and tented and the loop type is divided to two subgroups: radial and ulnar¹⁵. The whorl type is divided to five subgroups as simple, central packed loop, twinned loop, lateral packed loop, and accidental¹⁵. The

^{1,2,3}Assistant Prof. Forensic Medicine & Toxicology, Central Park Medical College, Lahore,

^{4,6}Lecturer in Biochemistry, ⁵Prof. Community Medicine

⁷Lecturer in Forensic medicine & Toxicology, ^{8,9,10}Medical OfficerS in Anesthesia, Avicenna Hospital Lahore.

Correspondence to Dr. Mudaser Hussain Abbasi Email: drmudaserhussainabbasi@yahoo.com

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^{16,17,18}.

MATERIALS AND METHODS

Finger prints were collected from the patients after obtaining their informed consent in the month of April, 2012 to June, 2012. A total of 113 diagnosed patients were selected from the OPD of Punjab Institute of Cardiology 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 and Medical Superintendent of Punjab Institute of Cardiology. The study design was cross sectional study. Patients of either sex diagnosed as a case of Hypertension, 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 e.g., eczema, leprosy and chronic dermatitis, having scars, congenital or acquired anomalies due to trauma on fingers and not diagnosed case of Hypertension were excluded from the 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 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

Sex Variation among the pattern in Hypertension

| | Male | Female |
|-----------|------|--------|
| Arch | 0 | 0 |
| Loop | 24 | 8 |
| Whorl | 41 | 33 |
| Composite | 6 | 1 |
| Total | 71 | 42 |

Gender

| | Male | Female |
|--------------------|------|--------|
| Frequency | 71 | 42 |
| Percent | 62.8 | 37.2 |
| Valid percent | 62.8 | 37.2 |
| Cumulative percent | 62.8 | 100 |

Pattern

| | Loop | Whorl | Composite | Total |
|-------------|------|-------|-----------|-------|
| Frequency | 32 | 74 | 7 | 113 |
| Percent | 28.3 | 65.5 | 6.2 | 100.0 |
| Valid % | 28.3 | 65.5 | 6.2 | 100.0 |
| Cumulative% | 28.3 | 93.8 | 100.0 | |

Analysis in this study was descriptive .A total of one hundred & thirteen patients participated in this study which were all known case of Hypertensive disease. Out of these one hundred & Thirteen patients the majority of the patients were belonging to whorl pattern of finger prints i-e. Sixty five 65% where as the number of patients belonging to Loop pattern was twenty eight 28% and pattern of composite was six 6% only and no any patient of arch pattern was found. 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. Limitations of study was it was only limited to Punjab Institute of Cardiology OPD patients and Limited only to Hypertensive heart disease patients. The study was considered on small and selected area, if it will be conducted on Nation wide on larger scale findings might be different.

DISCUSSION

Dermatoglyphic is a scientific method for anthropological, medico legal and genetic studies¹⁹ 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 identification¹⁹. A number of studies have indicated dermatoglyphic correlation in a large number of genetic disorders, which include diabetes mellitus²⁰, Schizophrenia²¹, Congenital heart disease²² and down syndrome²³. In our study we found Out of these one hundred & thirteen patients the majority of the patients were belonging to whorl pattern of finger prints i-e. Sixty five 65% where as the number of patients belonging to Loop pattern was twenty eight 28% and pattern of composite was six 6% only and no any patient of 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. Similar studies should be conducted on a larger sample at the National level so as to increase the accuracy of prediction²⁴. A study on coronary heart disease supports the same results²⁵. An other 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 same²⁶. 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 India²⁷. Finger print patterns are related to genetic predisposition to various disorders²⁵.

CONCLUSION

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

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.

REFERENCES

1. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J (2005) Global burden of hypertension: analysis of worldwide data. *Lancet* 365:217–223.]
2. Garcia EA, Newhouse S, Caulfield MJ, Munroe PB (2003) Genes and hypertension. *Curr Pharm Des* 9:1679–1689. [PubMed]10.2174/1381612033454513
3. Samani NJ (2003) Genome scans for hypertension and blood pressure regulation. *Am J Hypertens* 16:167–171.10.1016/S0895-7061(02)03244-2
4. Ward R (1980) Familial aggregation and genetic epidemiology of blood pressure. In: Laragh JH, Brenner BM, eds. *Hypertension: pathophysiology, diagnosis and management*. Raven Press, New York, pp 81–89.
5. Neal Uren and Dan Rutherford, 2004. High blood pressure, <http://metdoctor.com>.
6. 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.*
7. Shamsoddini S, Masomi M, Nagad-Hossini M. Relation between the lines on the fingers of hand and the incidence of disease in human. *Scientific*
8. *Journal of Kerman Medical Science University* 1997; 4(3): 136-142.
9. Simsek S, Taskiran H, Karakaya N et al. Dermatoglyphic analysis in children with CP. *Neurobiology-BP*. 1998; 6(3): 373-380.
10. Varma SL, Chary TV, Singh S, Ashorom Z. Dermatoglyphic patterns in schizophrenic patients. *Acta Psychiatr-second* 1995; 91(3): 213-215.
11. Drongowki RA, Coran AQ. Dermatoglyphic patterns in children with chronic constipation. *Dig Dis Sci* 1995; 40(7): 142.
12. Babler W. Embryonic development of epidermal ridges and their configurations. In: Platoc, Garruto RM, Schaumann BA, editors 1991; *Dermaoglyphics: Science in Transition Birth defects. Original article series; Vol 27.Wiley-liss,New York,pp.95-112.*
13. Van O el CJ,Baare WF,HUishoff 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
14. 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: 153-158.
15. United states Department of Justice FBI (US). *The scene of finger prints, Classiifcation and uses.*Us Government Printing Office;1984.
16. Jalali, E. and K.W. Hajian-Tilaki, 2002. Dermatoglyphic patterns in patients with myocardial infarction. *Acta Medical Irenics*, 40(3): 187-191.
17. Schauman B, Alter M, editors, *Dermatoglyphics in medical disorder*, Springer Verbiage. New York: Heidel berg, Berlin ;1976.
18. Martin NG, Eaves U, Loesch DZ.A genetical analysis of co variation between finger ridge count. *Am Hum Biol* 1982;9:539-52.
19. Bank Sd, Pa DIP, Mukerjee DP. Finger Dermatoglyphic variations in Rengma Nagas of Nagaland India.*Coll.Antropol*2009;33:31-5
20. QudsiaHassan,Ghulam MustafaYousufani,MuhammadIshaq,Mudaser Hussain Abbasi,Compartaive study of Dermatoglyphic among the students of Ziauddin University.*Med.Forum*, Vol.22,No.12.December ,2011.
21. 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.
22. Jim Van-Os J,woodruff PW, Fananas L,Ahmad F,Shuriquie N, Howard R,Murrar RM(2000).Association between cerebral structural abnormalities and dermatoglyphic ridge count in schizophrenia.*Compr.Psychiatry*.41(5):380-4
23. David, J.J., 1981. Dermatoglyphics in Congenital heart diseases. *Journal of medical Genetics.*, 18: 344-349.
24. Borroffice, R.A., 1978. Down's Syndrome in Nigeria: Dermatoglyphic Analysis of 50 cases: *NigeriaMedical Journal*, 8: 571-576.
25. 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.*
26. 25.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.*
27. Rashad MN.Dermatoglyphic trait in patients Cardio vascular disorders.*Am J PhysAnthropol*.1975; 42(2):281-283.
28. 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.

