Research Article

A Comparative study of quantitative dermatoglyphics in patients suffering from essential hypertension with normal individuals

Joshi Manoj B[1*], Chimurkar V K[2], Deshpande Jayashree[3]

[1]Assistant Professor, Department of Anatomy, B K L Walawalkar Rural Medical College and Hospital, Ratnagiri, Maharashtra, INDIA.
[2]Professor, Department of Anatomy, Jawaharlal Nehru Medical College, Sawangi, Wardha, Maharashtra, INDIA.
[3]Professor and HOD, Department of Anatomy, Fathima Institute of Medical Sciences, Ramarajupalli, Pulivendula Road, Kadapa, Andhra Pradesh, INDIA.
Email: drmbjoshi7@gmail.com

Abstract

Aims and Objective: To compare the Quantitative dermatoglyphics in patients suffering from essential hypertension with that of normal persons. **Introduction:** Dermatoglyphics is a branch of genetics dealing with the skin ridge system Through the years of research dermatoglyphics has immerged as a powerful tool in the diagnosis of psychological, medical and genetic condition. Diagnosis of Diabetes Mellitus Schizophernia, Hypertensionetc. Can now be aided by dermatoglyphicanalysis**.** This study is undertaken because the dermatoglyphics and essential hypertension both have Genetic basis. **Methodology:** The present study was carried out in 60 patients of essential hypertension and 60 normal individuals in Rajiv Gandhi Medical Sciences, Adilabad and normal individuals were obtained from UHTC area of RIMS, Adilabad. The study variables were analyzed using Chi-Square test and Relative Deviates for statistical significance. **Result:** In both the hands the *atd* angles were decreased in Hypertensive patients as compared controls which highly significant (In Right hand: R.D. = 9.65; $p < 0.001$ In Left hand: R.D. = 8.96; $p < 0.05$ Total: R D. = 9.305; $p < 0.05$.).It is also observed that there is significantly increased frequency of Thenar I_1 Pattern (Left hand χ^2=22.396,p< 0.00001; Right hand χ^2=10.389 P< 0.005) Thenar I_2 Pattern (Left hand χ^2=23.72, Right hand P<0.0005). χ^2=26.42,P<0.00001) Thenar I_3 Pattern (Left hand χ^2=27.21 P<0.00001Right hand χ^2=.28.31,P<0.0005). Thenar I_4 Pattern (Left hand χ^2 =28.1470.0005.Right hand χ^2=31.814,0.00001.). Hypothenar (Left hand χ^2 =17.642 P<0.0001 .Right hand χ^2 =21.946, P<0.0005). **Conclusion:** This study is has significantly proved that these quantitative parameters of Dermatoglyphics science i.e. decrease *in atd* angle, increased frequencies if Thenar I_1,I_2,I_3,I_4 Pattern and Hypothenar Pattern Can be utilized for screening of Person at risk and early detection of essential hypertension and further prevention of its complications.

Key word: Essential hypertension, Dermatoglyphics, *atd*-angle, Thenar Dermatoglyphics Pattern, Hypothenar Dermatoglyphics Pattern.

[*]**Address for Correspondence:**
Dr. Joshi Manoj B Assistant Professor, Department of Anatomy, B K L Walawalkar Rural Medical College and Hospital, Shreekshetra Dervan, Taluka Chiplun, Ratnagiri, Maharashtra 415606 INDIA.
Email: drmbjoshi7@gmail.com

Received Date: 10/07/2015 Revised Date: 22/08/2015 Accepted Date: 01/09/2015

Access this article online	
Quick Response Code:	Website: www.statperson.com
	DOI: 04 Sept 2015

INTRODUCTION

Essential hypertension is the category of hypertension that has no identifiable cause. It affects 90-95% of hypertensive patients. It is also associated with ageing and inherited genetic factors. Positive family history enhances the risk. Dermatoglyphics, the study of specific patterns of epidermal ridges in the palms and soles, is an unique and stable marker of identity, established in utero. Development of those ridges is regulated by genetic and environmental influences. As there is increased risk of hypertension in individuals with family history because of genetic factors, the study of co-relation between

How to site this article: Joshi Manoj B, Chimurkar V K, Deshpande Jayashree. A Comparative study of quantitative dermatoglyphics in patients suffering from essential hypertension with normal individuals. *International Journal of Recent Trends in Science and Technology* September 2015; 16(2): 303-306 http://www.statperson.com (accessed 06 September 2015).

dermatoglyphics and hypertension can help in early identification of people with the genetic predisposition to develop essential hypertension.[1] Diagnosis of Diabetes Mellitus[2] Schizophernia[3], Hypertension[4] etc. can now be aided by dermatoglyphicanalysis**.**Twin studies have shown that genetic factors play an important role in the pathogenesis of essential hypertension[5.] Dermatoglyphics helps in the early detection of cases of essential hypertension[6]. We have undertaken this study because It is well recognized that hypertension is now a major health problem in India[7,] the dermatoglyphics and essential hypertension both have Genetic etiology. Study of Dermatoglyphics is a non-invasive and cost effective method. Since other laboratory procedure for hereditary disease are expensive, Dermatoglyphics with other clinical signs can be used to define indications for other laboratory procedure.

MATERIAL AND METHODS

The present study was carried out in 60 patients of essential hypertension and 60 normal individuals. The patients of essential hypertension were collected from Department of Medicine Rajiv Gandhi Medical Sciences, Adilabad attending the medicine OPD and patients admitted in the medicine ward. The prints of normal individuals were obtained from UHTC area of RIMS, Adilabad. A detail clinical history was recorded regarding the age, sex, duration of hypertension, drug history, complete general and systemic examination including pulse, blood pressure, Respiratory system, Cardiovascular system, Central nervous system and relevant investigations including blood sugar, blood urea, serum creatinine, serum cholesterol, urine sugar, urine albumin.

Inclusion criteria

The studied cases comprise of newly detected and old cases of essential hypertension reporting the medicine OPD and ward, RIMS, Adilabad.

Exclusion criteria

Patients with secondary hypertension were excluded, History of smoking, Diabetes Mellitus, Ischemic Heart Disease ,Serum cholesterol > 200 mg/dl ,Pregnancy, Fever.

Criteria for selection of controls

60 age and sex matched healthy, non-hypertensive individuals without any of the above mentioned exclusion criteria and with normal clinical examination were chosen as controls.

Data collection

Structured format for details of subjects,Dermatoglyphic prints of both hands of each subject

Method

Dermatoglyphic prints were obtained using ink method described by Cummins and Midlo (1961)[8] and modified Purvis Smith method was applied[9,10].

RESULT

Table 1: Showing mean value of 'atd' angle in right and left hand of patients and controls

Side of hand	'atd' angle (degrees)			
	Patients		Controls	
	Mean	SD	Mean	SD
Right	42	± 4.95	54	± 4.25
Left	41	± 4.98	43	± 4.25
Right + Left	41.5	± 2.91	43	± 2.34

(In Right hand: R.D. = 9.65; p < 0.0 In Left hand: R.D. = 8.96; p < 0.05 Total:RD. = 9.305; p < 0.05.)

Table 1. Shows The average measurement of atd angle in right hand of essential hypertension is 42^0 as compared to 54^0 of control group, this observed difference is statistically significant(R D. = 9.305; p < 0.05.). Left hand also shows decrease in atd angle in patients than controls which is also significant (R.D. = 8.96; p < 0.05). The mean value of atd angle shows statistically significant decrease in patients than controls(RD=9.305; p<0.05)

Table 2: Frequency of Thenar / I_1 area pattern in right and left hand of patients and controls

Side of hand	Patients	Controls	X^2	P - value	Inference
Right	37 (61.66%)	16 (26.66%)	22.396	0.00001	Significant
Left	43 (71.66%)	34 (56.66%)	10.389	0.0055	Significant

Table 2 shows frequency of thenar / I_1 pattern in both right and left hands. In right hand there is increased frequency of I_1 area pattern in patients i.e 37 (61.66%) as compared to controls i.e. 16 (26.66%) which is statistically significant (X^2=22.396,P< 0.00001 which is highly significant)

Similarly in left hand also there is increased frequency of thenar pattern is observed in patients i.e. 43 (71.66%) as compared to controls i.e. 34 (56.66%). which is statistically significant (X^2=10.389 P< 0.005,highly significant).

Table 3: Frequency of I_2 area pattern in right and left hand of patients and controls

Side of hand	Patients	Controls	X^2	P - value	Inference
Right	25 (41.66%)	09 (15.00%)	26.423	0.00001	Highly Significant
Left	24 (40.00%)	10 (16.66%)	23.721	0.0005	Highly Significant

The above table shows that there is increased frequency of I_2 area pattern in patients i.e. 25 (41.66%) as compared to controls i.e. 09 (15.00%) in right hand which is highly significant (X^2=26.42,P<0.00001).
Similarly there is increased frequency of I_2 area pattern in patients i.e. 24 (40.00%) as compared to controls i.e. 10 (16.66%) in left hand which is highly significant (X^2=23.72,P<0.0005).

Table 4: Frequency of I_3 area pattern in right and left hand of patients and controls

Side of hand	Patients	Controls	X^2	P - value	Inference
Right	30 (50.00%)	13 (21.66%)	28.312	0.0005	Highly Significant
Left	31 (51.66%)	14 (23.33%)	27.213	0.00001	Highly Significant

The above table shows that there is increased frequency of I_3 area pattern in patients i.e. 30 (50.00%) as compared to controls i.e. 13 (21.66%) in right hand which is highly significant (X^2=.28.31,P<0.0005)
Similarly there is increased frequency of I_3 area pattern in patients i.e. 31 (51.66%) as compared to controls i.e. 14 (23.33%) in left hand highly significant (X^2 =27.21 P<0.00001).

Table 5: Frequency of I_4 area pattern in right and left hand of patients and controls

Side of hand	Patients	Controls	X^2	P - value	Inference
Right	39 (65.00%)	15 (25.00%)	31.814	0.00001	Highly Significant
Left	35 (58.33%)	13 (21.66%)	28.147	0.00055	Highly Significant

The above table shows that there is increased frequency of I_4 area pattern in patients i.e. 39 (65.00%) as compared to controls i.e. 15 (25.00%) in right hand ,which is Highly Significant.

Similarly there is increased frequency of I_4 area pattern in patients i.e. 35 (58.33%) as compared to controls i.e. 13 (21.66%) in left hand which is Highly Significant.

Table 6: Frequency of hypothenar area pattern in right and left hand of patients and controls

Side of hand	Patients	Controls	X^2	P - value	Inference
Right	27 (45.00%)	10 (16.66%)	21.946	0.00053	Significant
Left	31 (51.66%)	16 (26.66%)	17.642	0.0001	Significant

Table 6: shows that there is increased frequency of hypothenar area pattern in patients i.e. 27 (45.00%) as compared to controls i.e. 10 (16.66%) in right hand which is Highly Significant.

Similarly there is increased frequency of hypothenar area pattern in patients i.e. 31 (51.66%) as compared to controls i.e. 16 (26.66%) in left hand which is Highly Significant.

DISCUSSION

The atd angle is formed by a line drawn from triradius "a" to tiradius "t" with a line from triradius "t" to triradius "d". When more than one triradius arc present, the most distal point is used to measure the atd angle.atd angle shows statistical significance in right, left and both (right and left hand) in present study i.e.atd angle decreases in essential hypertension patients as compared to controls this could be beacause of shift of axial triradius. Pursnani ML, Elhence GP, Tibrewala L (1989)[11] in their study observed that atd angle in right and left hand shows significant decrease when compared with normal. Present study co-relates with their observation Jain PK *et al* (1984)[12]. Reported decreased *'atd'* angle in hypertensive cases in both sexes as compared to controls10. Kulkarni DU (2005)[13] revealed the same result in their study.

Thenar/I_1 area: In hypertensive patients the pattern frequency is increased significantly in both right and left hands, more so in left hand. The pattern resembles arch opening towards radial side.

I_2 area: The pattern frequency is found to be significantly increased in right and left hands of hypertensive patients as compared to controls.

I_3 area: The area pattern frequency in both the hands of hypertensive patients is significantly increased as compared to controls.

I_4 area: In both the hands area pattern frequency in hypertensive patients is significantly increased as compared to controls.

Hypothenararea: The area pattern frequency is significantly increased in both the hands of hypertensive patients as compared to controls.

CONCLUSION

This study is has significantly proved that these quantitative parameters of Dermatoglyphics science i.e. decrease *in atd* angle, increased frequencies if Thenar I_1,I_2,I_3,I_4 Pattern and Hypothenar Pattern Can be utilized for screening of Person at risk and early detection of essential hypertension and further prevention of its complications.

REFERENCES

1. Deepa.G., Khan A.A., Study of Palmar Dermatoglyphics in Essential Hypertension among people living in catchment area of NMCH, Raichur.2009. www.rguhs.ac.in/cdc/onlinecdc/uploads/01_M031_10410.doc cited on 12-05-13

2. Chowdhary ES. Busar RP. Dermatoglyphics study of Juvenile diabetes mellitus. Journal of Anatomical society of India April .1982; 31 (1), Abstract No- 43.
3. Shield J P H, Wadsworth E J K, Hobbs K, Baum JD. Dermatoglyphics, Fetal growth and insulin dependant diabetes in children under 5 years. Archives of diseases in childhood. 1995; 72 (2), 159-160.
4. Kulkarni D U , Herekar N G .Dermatoglyphics in essential hypertension in western Maharashtra population. Journal of anatomical society of India 2004-05; 54(2):1.
5. Chobanian VA, Bakris GL, Black HR,Cushman WC, Green LA, Izzo JL Hypertension. American Heart Associatio 2003; 42; 1206.
6. Godfrey KM, Barker DJP, Peace J, Cloke J, Osmond C. Relation of fingerprints and shape of the palm to fetal growth and adult blood pressure. British Medical Journal 1993; 307: 405-09.
7. Park K. Park's Textbook of Preventive and Social Medicine. 18th Ed. Banarsidas Bhanot; 2005; 295.
8. Cummins H, Midlo C. Finger Prints Palm and Sloe – An Introduction to Dermatoglyphics.New York, NY – Dover 1961: 22.
9. Schaumann B, Alter M. Dermatoglyphics in medical disorders. New York: Springer Verlag; 1976.p.1-129.
10. William JB. Embryonic development of epidermal ridges and their Configurations-Birth defects: Original Article Series 1991; 27:95-112.
11. Pursnani ML, Elhence GP, Tibrewala L (1989): Dermatoglyphics in essential hypertension, Indian Heart Journal, Mar-Apr; 41 (2): 1 1 9-22.
12. Jain PK, Sharma BK, Mathur BD. Dermatoglyphics in essential hypertension. Journal of Association of Physicians India 1984; 32(4):335-337.
13. Kulkarni DU, Herekar NG. Dermatoglyphics in Essential hypertension in Western Maharashtra Population. Journal of the Anatomical society of India 2005–06; 54(2):1.

Source of Support: None Declared
Conflict of Interest: None Declared