COMPARISON OF PALMAR ATD ANGLE AND A-B RIDGE COUNT IN NORMOTENSIVE AND HYPERTENSIVE PATIENTS

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Abstract

Introduction-Hypertension is a multifactorial disease that affects a large segment of the population. According to previous research we can diagnose various diseases earlier by the help of dermatoglyphic pattern. Dermatoglyphics is the analysis of palmar prints as a genetic marker that can be related to health & disease.

Aim & Objective:Analyze various palmar ridges in hypertensive patients in terms of its quantity & compare present data with previous (diseased) population data for probable outcome.

Method:The present study was conducted in the department of Anatomy, LNCTU, Bhopal. Subjects of the age group 30-55 years. The bilateral palm prints of 108 hypertensive patients & compare with 108 normotensive subjects. Palmar dermatoglyphic features derived from quantitative parameters (a-b ridge count and atd angle) were analyzed.Hand prints were taking with the help of duplicate ink on white paper.

Results: According to the data collected no. of cases& control were 216. I found that atd Angle of both the hands were higher in males as compare to females. A-b ridge count was more in case groups than in controls.

Conclusion: Dermatoglyphics studies may be used as an additional diagnostic tool for genetic disease in medicine. As the dermatoglyphics techniques are rapid and inexpensive, so it can be used as screening tool to identify the people who are at high risk of disease.

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Introduction-Dermatoglyphics (Derma = Skin + Glyphe = Carve) is the scientific study of fingerprint and palmar patterns which are imprints of epidermal ridges. It gives a unique identification to all individuals[1]. Dermatoglyphic features begin developing during early stages of fetal life and are fully formed by the end of the fourth month of intrauterine life, and very importantly, they do not change throughout postnatal life[2,3,4]. Dermatoglyphics is the term applied to the scientific study of fingerprint and palmar patterns along with their quantitative measures[5]. It is the scientific method of reading lines and ridges of finger, palm and sole. The term dermatoglyphics was first introduced in 1926 by Cummins and Mildo, though Bidlow was first to give descriptions of ridges in detail in 17th century[6]. Various dermatoglyphics studies of patients suffering from different congenital disorders and disease such as diabetes mellitus, leukemia, hypertension, bronchial asthma and various cancers etc. have been conducted, completed and contrasted, A significant link has been found between dermatoglyphics pattern and the disease. Therefore, dermatoglyphics analysis has been established as a useful diagnostic and research tool in medicine, providing important insights into the inheritance and embryologic development of many clinical disorders[7,8].

Aim & Objective:Analyze various palmar ridges in hypertensive patients in terms of its quantity & compare present data with previous (diseased) population data for probable outcome & to develop Dermatoglyphics as a tool for pre-identification of hypertension.

Material and Methods:

Method: The present study was conducted in the department of Anatomy, LN Medical College Bhopal Madhya Pradesh, India. Subjects of the age group 30-55 years. Cases for the study were clinically diagnosed patients of hypertension and controls were random healthy individuals. The ethical clearance was obtained from the institutional ethics committee prior to this study.The bilateral palm prints of 108 hypertensive patients & compare with 108 normotensive subjects. Palmar dermatoglyphic features derived from quantitative parameters (a-b ridge count and atd angle) were analyzed.

Quantitative Analysis

a-b ridge count: The a-b ridge count represents the number of ridges observed between the radial triradius and the triradius of the middle finger.

atd angle: The atd angle is the angle between two straight lines joining the radial and ulnar triradii to the hypothenartriradius.

Used Material: Black Duplicating Ink,Stamp Pad, white Paper,Magnifying hand Lens, Soap, Towel, Scale,Sphygmomanometer**,** Stethoscope.

Procedure-Dermatoglyphics prints were taken by the 'Ink Method' described by Cummins and Mildo (1961)[5]. Patients were informed about the procedure in detail and written informed consent was taken from the patients. Subjects were asked to wash their hands with soap water and dried with a soft cotton cloth, so as to remove any oil or dirt. Distal phalanges were inked over the stamp pad by firm pressure starting from thumb. Prints were taken on the white paper by rolling method. The thumb was placed with ulnar edge downward and rolled toward the body and other digits were placed with radial edge downward and rolled away from the body. Each
sheet was labeled with serial numbers for digits: I - thumb, II - index, III - middle, IV- ring, V-little finger. The printed sheets were coded with name, age, sex and for case group (hypertensive patients) and control group. The prints were analysis with the help of magnifying hand lens.

Exclusion Criteria:

- Individuals suffering from any skin disease like eczema, leprosy etc were excluded.
- Subjects with congenital malformation of hand,deformed finger and palm, infection and injury, scars of burns of fingers and palms, hand anomalies, inflammation, trauma, were excluded from the study.

OBSERVATION &RESULTS:

According to the data collected total no. of cases & control were 216. I found that ATD Angle were higher in cases group as compare to controls. In both cases& controls ATD angle were higher in left hand of females as compare to the left hand of males. The frequency of A-b ridge count were more in controls than cases, but in the hypertensive cases a-b ridge count were higher in left hand of female as compare to males left hand.

	Case Group (108)		**Control Group (108)**	
Parameters	Right Hand	Left Hand	Right Hand	Left Hand

ATD angle	37.1±1.5	36.7±1.6	36.5±1.3	35.8±1.9
A-B Ridge Count	17±1.1	16.8±1.3	20.6±1.1	19.9±1.1

Table:-1 Mean & SD of Case & Control

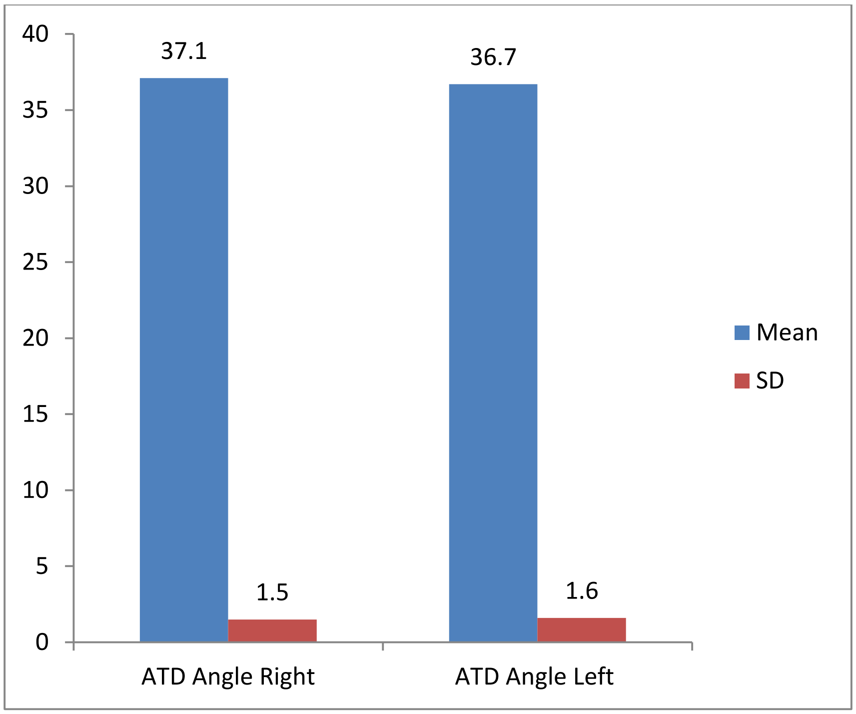

Fig.1 ATD Angle of 108 Cases in Right & Left Hand

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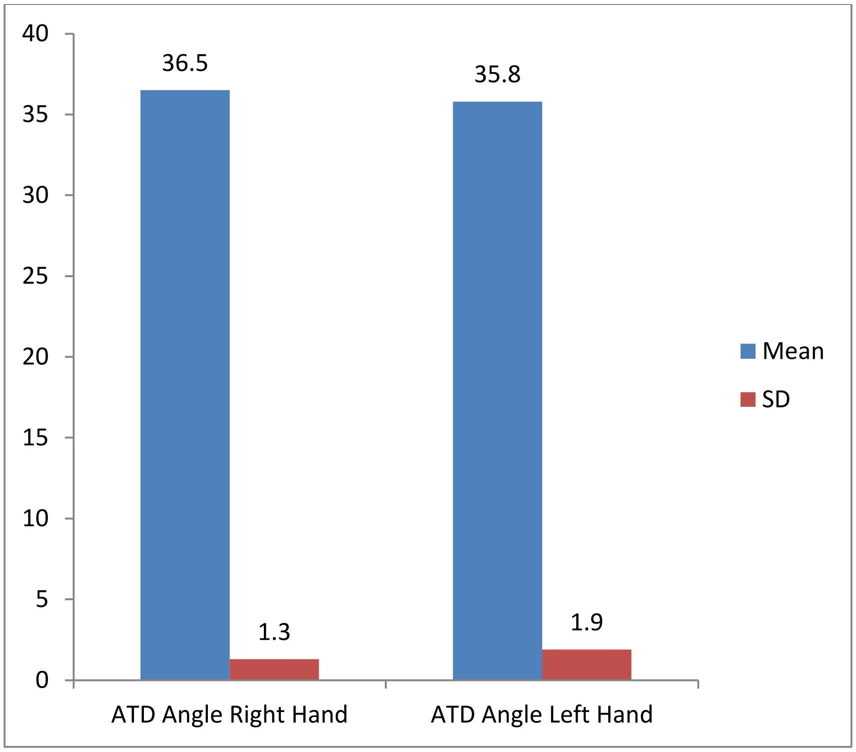

Fig.2 ATD Angle of 108 Control in Right & Left Hand

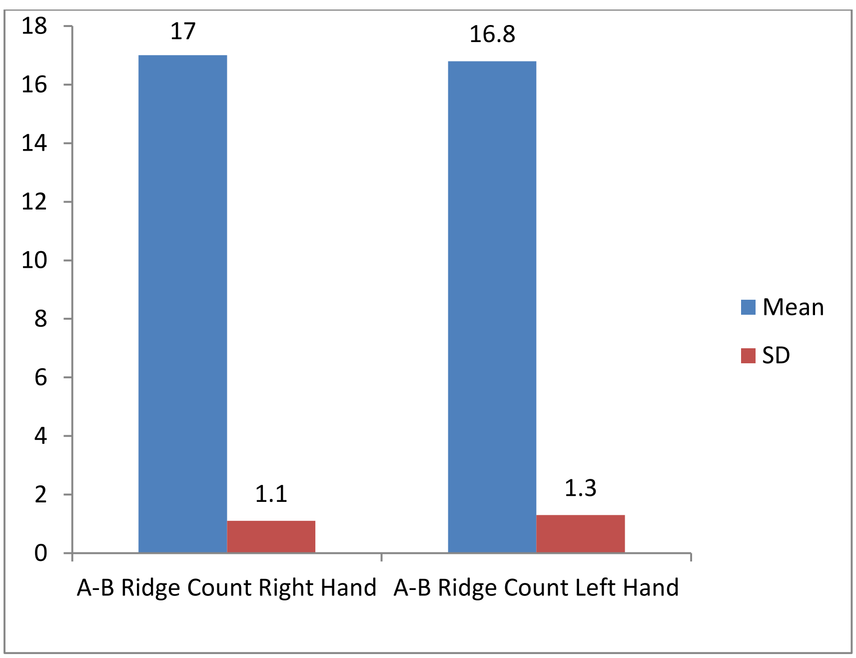

Fig.3 A-B Ridge CountCase (108)Right & Left Hand

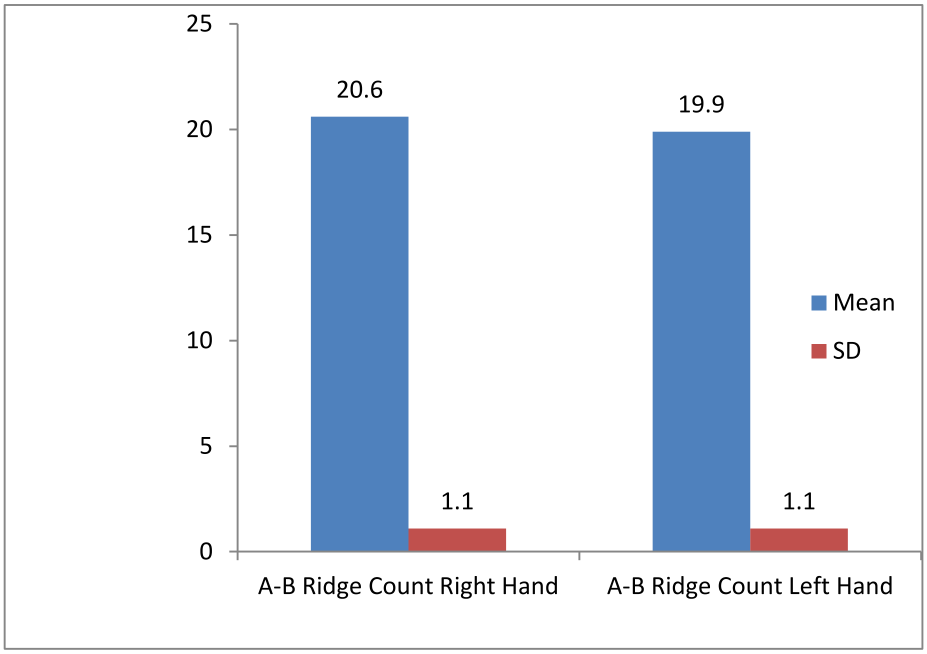

Fig.4 A-B Ridge CountControl (108)Right & Left Hand

DISCUSSION-High blood pressure is the common name for the medical condition known as hypertension. Hypertension "the silent killer of mankind" is a public health problem. If untreated, it produces a lot of complications like heart disease, kidney disease etc.

Study by	type	Cases(Hypertension)	Control	Dermatoglyphic findings
Deepa G et al.(2013)[9]	Case-control study	100 (male 50 & female 50)	100 (male 50 & female 50)	In hypertensives decreased a-b ridge count for both males & females.
Oladipo et al. (2010)[10]	Case-control study	50 (male 26 & female 24)	50 (male 26 & female 24)	In hypertensives showed higher atd angle in both sexes.
Palyzova et al. (1991)[11]	Case-control study	172 (Male 116 & female 56)	240 (male 130 & female 110)	In hypertensive patients: significantly high atd angle in both sexes& lower a-b ridge count observed in right hand of females.
Lahiri et al. (2013)[12]	Case-control study	131	145	In hypertensives showed higher atd angle in both sexes.
Tafazoli et al. (2013)[13]	Case-control study	40	20	In hypertensives, larger atd angle and

				significantly larger in left hand of females.
Reed T et al. (1995)[14]	Case-control study	308 males	316 males	In hypertensives lower palmar a-b ridge count.
Present study (2023)	Case-control study	108 (male 54 & female 54)	108 (male 54 & female 54)	In hypertensives significantly higher atd angle in both sexes & lower frequency of a-b ridge count in males & females. In females higher a-b ridge count in left hand.

Table:-2 Comparison with Previous Studies

CONCLUSION: Dermatoglyphics studies may be used as an additional diagnostic tool for genetic disease in medicine. As the dermatoglyphics techniques are rapid and inexpensive, so it can be used as screening tool to identify the people who are at high risk of disease and allows to adopt more preventive measures for future generation.

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