



STUDY OF 'atd' ANGLE IN ISCHEMIC HEART DISEASE PATIENTS

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ABSTRACT **Background:** Ischemic heart disease is the most important cause of mortality and morbidity in the world. Dermatoglyphics is the scientific study of skin creases and lines and has formed an important part of surface anatomy. The development of dermatoglyphics occurs at much earlier embryonic stage at which most of the organs and systems develop including the cardiovascular system. Hence in this study we evaluated the dermatoglyphics in patients of ischemic heart disease as compared to normal counterparts.

Materials and Methods: Study was carried out in Department of Anatomy, Kakatiya Medical College, Warangal during January 2018 to June 2019. Finger prints and palm prints of 100 diagnosed cases of Ischemic heart disease (50 males and 50 females) and 100 control group (50 Males and 50 Females) were obtained. Standard ink method was used for data collection of both the hands. Written consent of the patients was obtained.

Results: Significant increase in the mean value of 'atd' angle in both sexes in Ischemic heart disease patients was observed as compared to controls.

Conclusion: From the present study, it appears that there exists a specific relation in the 'atd' angle and Ischemic heart disease patients, as compared to normal subjects.

KEYWORDS : Dermatoglyphics, Ischemic heart disease, Control group, 'atd' angle.

INTRODUCTION

Dermatoglyphics is the scientific study of epidermal ridges and their configurations on the palmar region of the hand and fingers and plantar region of the foot and toes. The term **Dermatoglyphics** was coined by **Cummins and Midlo** in 1926 and was derived from Greek words 'Derma' means skin and 'Glyphics' means carvings²

The ridge pattern depends upon the cornified layer of epidermis and dermal papillae. The typical patterns of epidermal ridges are determined in the fetal life. The ridges are differentiated in their definitive forms during third and fourth month of fetal life and once formed remain permanent and never change throughout the life except in the dimension in proportion to the growth of an individual. The original ridge characteristics are not disturbed unless the skin is damaged to a depth of about-one millimeter.³

Development of dermatoglyphic pattern is under genetic control. This is evident from the clear resemblance of Dermatoglyphics among related persons.⁴ There are many diseases known to be caused by abnormal genes. Whenever there is any abnormality in the genetic pattern it is reflected in their dermatoglyphic pattern.⁵

Dermatoglyphics as a diagnostic aid is now well established in a number of diseases. These diseases have strong hereditary basis. Dermatoglyphics offer at least two major advantages as an aid to the diagnosis of medical disorders:

1. The epidermal ridge patterns on palms and soles are fully developed after birth and there after remain unchanged for life.
2. Scanning of ridge patterns or recording their permanent impressions can be accomplished rapidly, inexpensively and without any trauma to the patients.
3. Finally, the relevance of dermatoglyphics is not to diagnose, but of prevention, by predicting a disease, not for defining an existing disease, but to the identification of people with the genetic predisposition to develop certain diseases.⁴

Ischemic Heart Disease (IHD) is the most common, serious, chronic, life-threatening illness in the developed world. A substantial increase in Ischemic Heart Disease is projected worldwide, and Ischemic Heart Disease is likely to become the most common cause of death worldwide. More than half of these deaths occur before the attacked individuals reach the hospital.⁶ IHD is one of the most common diagnosis in hospitalized patients in India.

The diagnosis of IHD is often difficult due to scarcity of physical signs,

especially in rural areas of developing countries like India where diagnostic facilities are lacking.⁷ The study of dermatoglyphics may be helpful in the preventive aspect of the disease. Various studies were conducted at different parts of India and elsewhere to find the pattern of dermatoglyphics in IHD patients so that a warning can be given to those people of vulnerable group. But this kind of study is not done in Telangana.

Dermatoglyphics in Myocardial infraction was studied in Bangladesh in 2011. Dermatoglyphics in Coronary heart diseases was studied in Maharashtra in 2010. Taking these facts into consideration the present study aims to determine various dermatoglyphic features among IHD and compared them with controls. By this we can establish the importance of dermatoglyphics as a useful investigatory screening procedure among IHD as this type of study has not been conducted in this part of Warangal. Further the patient population we deal with in the Mahatma Gandhi Memorial Hospital, Warangal is largely rural, because of this, such study would be particularly useful.

MATERIALS AND METHODS

The material for the study consisted of finger and palm prints of patients selected from in patient & out patient departments of Cardiology from Mahatma Gandhi Memorial Hospital, Warangal.

Consent from both cases and controls was taken before taking the finger prints.

Sampling size:

1. 100 patients with IHD are taken as cases (50 males and 50 females). Cases are diagnosed as having Ischemic heart disease by the opinion of Cardiologist.
2. Controls are 100 normal individuals (50 males and 50 females).

EXCLUSION CRITERIA:

Those with diabetes, hypertension, cardiac disease are excluded in control group.

The materials used to take the dermatoglyphic patterns of the palms were: Porcelain tile, "Camlin" duplicating ink, a rubber roller, white executive bond paper of 15cms x 20cms, sponge of 30cms x 20cms, spirit, soap, towel, water, cotton and magnifying lens.

METHOD:

For collection of the data, standard ink method was used.³ Patients and controls were made to wash both the hands, with soap and water and

dried by towel. A small amount of camlin's duplicating ink was spread over the porcelain tile by means of rubber roller to obtain a thin uniform film of ink on the tile.

Prints of the finger tips: The distal phalanges of person's right hand were inked over the tile by a firm pressure starting from the thumb. Executive bond paper kept over the wooden pad was used for recording the finger print patterns. Rolled finger prints were obtained from thumb to little finger. The prints were numbered as Digit number I, II, III, IV and V from thumb to the little finger. The same procedure was done for recording the finger prints of the left hand.

Prints of the palms: The palm of the person's right hand was inked over the tile by applying firm pressure over the dorsum of hand and if, necessary it is again inked with the help of rubber roller. An executive bond paper of size 15 x 20 cm was kept on the wooden pad and the right hand of the person was pressed firmly on the paper using even pressure on the dorsum of the hand and a palm print was obtained. The above procedure was repeated to print left Palm. Prints were examined by using magnifying lens and details were noted.

Axial triradii: Triradius is the point of confluence of ridges. Triradii close to palmar axis found in the proximal region of palm, near the wrist crease are termed as Axial triradius (t). t'- triradius situated near the center of palm. t'- intermediate triradius situated between t" and t. There are four digital triradii at the base of each finger from index finger to little finger (a, b, c, and, d). The Axial triradius "t" is between the thenar and hypothenar area in line of fourth metacarpal. 'atd' Angle: is constructed by joining the three triradius-a, t, and d. the atd angle is decided genetically and determined in fetal life itself (Sadler 2006).⁸ When more than one axial triradii are present the most distal one is used for measurement of 'atd' angle (Fig. 1).

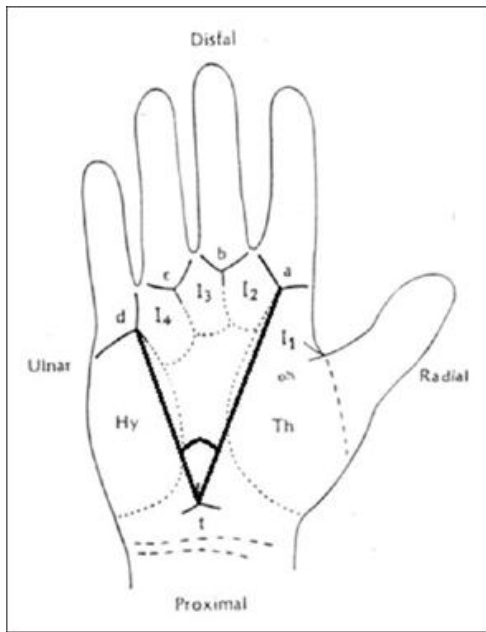


Figure 1: Showing Palmar Pattern Configuration and Palmar Areas with Palmar Triradii

OBSERVATION:

In the present study all the data obtained from both Ischemic heart disease group and controls were analyzed quantitatively using student's t-test to determine any significant difference in 'atd' angle.

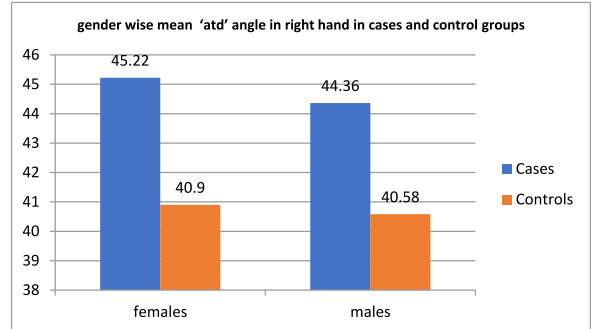
In the present study, the mean value of atd angle was more in cases in both right and left hands and in both females and males when compared to controls.

The difference in 'atd' angle between female IHD cases and controls in right hand showed statistical significance (p value 0.0041) and that of left hand showed statistical significance (p value 0.0077).

The difference in 'atd' angle between male IHD cases and controls in right hand showed statistical significance (p value 0.0122) and that of left hand showed statistical significance (p value 0.0090).

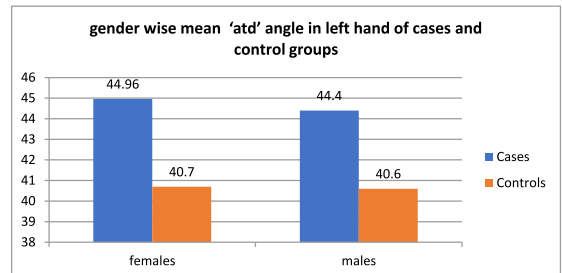
Mean 'atd' angle in IHD & control groups of Right hand of both sexes

Sex	Group	Number	Mean	SD	P value
Female	Cases	50	45.22	8.64	0.0041
	Controls	50	40.9	5.75	
Male	Cases	50	44.36	8.94	0.0122
	Controls	50	40.58	5.45	



Mean 'atd' angle in IHD & control groups of Left hand of both sexes

Sex	Group	Number	Mean	SD	P value
Female	Cases	50	44.96	9.31	0.0077
	Controls	50	40.7	6.00	
Male	Cases	50	44.4	8.17	0.0090
	Controls	50	40.6	5.92	



DISCUSSION

Dermatoglyphics as a diagnostic tool is now well established in number of diseases which have strong hereditary basis. Ischemic heart disease being the hereditary background, certain dermatoglyphic variation is to be expected in it. The observed values in the current study were first subjected to the test of statistical significance and the findings were then compared with the available literature of previous workers. In the present study, the mean value of 'atd' angle in ischemic heart disease group is increased in both right and left hands as compared to the controls. There is also increase in the mean value of 'atd' angle in both sexes with significant increase in ischemic heart disease group. These findings were found to be similar with following workers.

Hemalatha Dhanraj et al⁹ observed that the mean value of 'atd' angle is increased in cases in both left and right hands and in both males and females when compared to controls and the mean value of atd angle in all groups of CAD is increased in both right and left hand as compared to the controls with significant increase in Double vessel disease (P<0.05) and Triple vessel disease (P<0.05) in both hands. There is increase in the mean value of atd angle in both sexes and in both hands with significant increase in CAD males (P<0.001) and CAD (M+F) (P<0.001).

Rathva Ashish et al¹⁰ found there is increase in the mean value of 'atd' angle in both sexes and in both hands with significant increase in CAD males (P<0.01) and (M+F) (P<0.01).

CONCLUSION

The knowledge of dermatoglyphic pattern in patients with Ischemic heart disease is an interesting matter and little information is available about this relation. From the present study it is concluded that there is significant variation in 'atd' angle in ischemic heart disease patients when compared to controls. The diagnosis of ischemic heart disease is often difficult due to scarcity of physical signs, especially in rural areas of developing countries where diagnostic facilities are lacking. Presence of above dermatoglyphic features will help us to predict that

these individuals may be susceptible for ischemic heart disease.

List of abbreviations used:

M: Male

F: Female

IHD: Ischemic heart disease

CAD: Coronary artery disease

SD: Standard Deviation

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