



## RESEARCH ARTICLE

### ANALYSIS OF DERMATOGLYPHIC 'atd' AMONG VARSITY RUNNERS

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#### ABSTRACT

The Dermatoglyphic features may be used as a suggestive diagnostic tool to the persons who are at risk of some ailments and to check the performance. The “atd” angle is the most widely used method in Dermatoglyphics. The present study aims to examine the dermatoglyphic ‘atd’ angle among different pace runners of all India varsity track runners. The study was confined on 88 athletes, who are participated in the 75th All India Inter University Athletic Championship held at Rajiv Gandhi University of Health Sciences, Bangalore, Karnataka during 16 to 20 January 2015. The subjects who are qualified for finals in the events of sprint n=40 (100m, 200m, 400m, 110m Hurdles, 400m Hurdles), Middle Distance n=16 (800m, 1500m) and long distance n=32 (3000m, 5000m, 10000m, 20km walk) athletes were selected and grouped accordingly. The age of the subjects ranged from 18 to 28 years. The ‘atd’ angle (in degrees) was selected as dependent variable and measured by using Cummins ink method. The collected data was analyzed statistically by using analysis of variance (ANOVA) to find out the significance among groups. Further, the Scheffe’s post hoc test was applied to know the paired mean difference if any between groups. The independent ‘t’ test was employed to find out the difference between right hand and left hand ‘atd’ angle of total population. The level of confidence was fixed at 0.05. The present investigation revived that there was no significant difference between the right hand and left hand ‘atd’ angle among different pace runners.

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## INTRODUCTION

Dermatoglyphics is a science about peculiarities of dermal ridges constructions on human and primate fingers and hands as well as on feet and toes. As today there is the competition in all the sport activities, athletic game is no more different having tremendous competition among its players. The identification of talent for the future elite sports men in early childhood or at the early adolescence have become the prime need and also for taking inter and intra completion of the game in mind. Some of the traditional and World famous events such as Olympics, world championships, Common Wealth games, Inter-continental events, Asian games, etc., prompts us to analyse various aspects of the athletes especially their genetic and anthropological characteristics (Gahlot, 2013). Dermatoglyphical studies in the fields of genetics, medicines and criminology are very common but the use of these areas in identifying sports talent is gaining attentions throughout the World.

Scientists have incorporated dermatoglyphics, genetics, neural science and embryology with the theory of multiple intelligences (Gardner, 1993). So sprinters, long-distance runners, jumpers, throwers, footballers, forwards, halfbacks, fullbacks and boat racing sportsmen of different types have differential distinctions in dermal ridges. General characteristics of a person in relation to certain qualities are reflected in dermatological pattern (Manoj, 2014). The sporting arena has become so much competitive, that the talents in different games and sports need to be identified at a very early age, so as to give them much specialised coaching from the much younger age (Singh & Kumar, 2013). The Dermatoglyphic features may be used as a suggestive diagnostic tool to make a provisional diagnosis to identify the persons who are at risk of some ailments and to check the performance among athletes of different sports activities. But it requires more extensive studies in a large number of patients as well as athletes (Sharma and Sharma, 2012). Besides that the patterns of dermatoglyphics among athletes of different sports activities may help in finding specific variations among different sports groups and so the study of dermatoglyphics may help to prepare a criterion for talent selection (Lahiri *et al.*, 2013). The “atd” angle is the most widely used method in

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Dermatoglyphics. The axial tri-radius is present in the proximal part of the palm in alignment to the fourth meta-carpel bone. The 'atd' angle is formed by the lines drawn from the digital tri-radius 'a' to the axial tri-radius 't' and from this tri-radius to the digital tri-radius 'd'. The 'atd' angle is a Dermatoglyphic trait formed by drawing lines between the tri-radial below the first and last digits and the most proximal tri-radius on the hyposthenia region of palm. The analysis of the reliability of the 'atd' angle in dermatoglyphics by Brunson (2006), suggests that the 'atd' angles can be measured reliably by different readers. Perhaps the most widely used method is based on the 'atd' angle. Hence, the present study will compare the 'atd' angle of all India varsity runner players and their achievements.

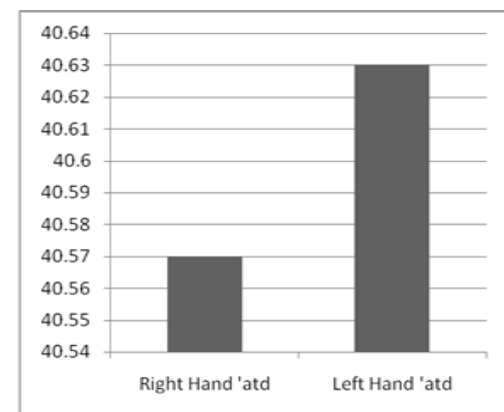
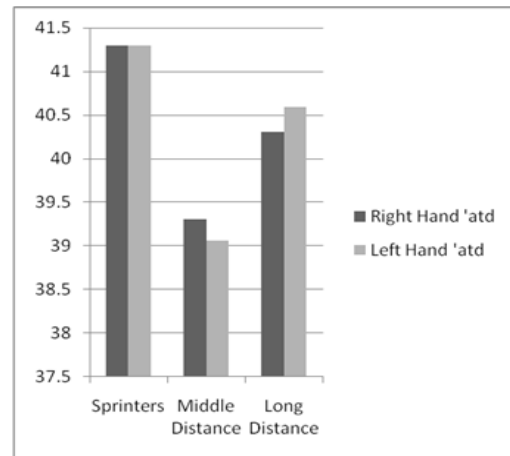
## MATERIALS AND METHODS

The study was confined on 88 athletes, who are participated in the 75<sup>th</sup> All India Inter University Athletic Championship held at Rajiv Gandhi University of Health Sciences, Bangalore, Karnataka during 16 to 20 January 2015. The subjects who are qualified for finals in the events of sprint (100m, 200m, 400m, 110m Hurdles, 400m Hurdles), middle distance (800m, 1500m) and long distance (3000m, 5000m, 10000m, 20km walk) were selected for this study. The age of the subjects ranged from 18 to 28 years. According to their category, the subjects are classified into three groups such as group-I sprinters n=40, group-II middle distance runners n=16 and group-III long distance runners n=32. The 'atd' angle (in degrees) was selected as dependent variable and measured by using Cummins ink method. The 'atd' angle is formed by drawing lines between the tri-radial below the first and last digits and the most proximal tri-radius on the hyposthenia region of palm. The collected data was analyzed statistically by using analysis of variance (ANOVA) to find out the significance among groups. Further, the Scheffe's post hoc test was applied to know the paired mean difference between groups if they obtained 'f' value found significant. The independent 't' test was employed to find out the difference between right hand and left hand 'atd' angle of total population. The level of confidence was fixed at 0.05.

## RESULTS

The Table-1 shows the present observation that there was no significant difference among different pace runners such as sprinters, middle distance runners and long distance runners on right hand and left hand 'atd' angle.

Further, the independent 't' test applied to find the significance between right hand and left hand 'atd' among the runners and presented in Table II. The Table -II shows that there was no significant difference on 'atd' angle between right hand and left hand respectively.



## DISCUSSION

The result of present study shown that there was no significant difference among sprinters, middle distance runners and long distance runners on dermatoglyphics 'atd' angle and also there was no significance between right hand and left hand 'atd'. The results of the present study may have relationship with various researchers in the different disciplines and are presented in explored and interactive manner. The 'atd' angle once formed remains unchanged throughout the life which is decided genetically and determined in foetal life (Sadler, 2006; Moore, 2004).

**Table I. Anova of right and left 'atd' angle among different pace runners**

Test		Sprinters	Middle	Long	SOV	SS	Df	Ms	F
Right Hand	Mean	41.30	39.31	40.31	B	48.731	2	24.365	1.745
	SD	4.60	3.17	2.59	W	1186.712	85	13.961	
Left Hand	Mean	41.30	39.06	40.59	B	57.307	2	28.654	1.978
	SD	4.25	3.67	3.22	W	1231.056	85	14.483	

\*Significant at 0.05 levels, table value for df 2 is 3.06.

**Table II. Dependent 'T' test between right hand and left hand 'ATD' angle**

Hand	Total Strength (N)	Mean	S.D	df	't' Value
Right Hand	88	40.57	3.76	174	0.099
Left Hand		40.63	3.84		

This proves that the 'atd' angle is formed and established in foetal period and never changes in life. In our study shows that the middle distance runners have better 'atd' angle compare with sprinters as well as long distance runners. The findings of the present study which are related with previous research were discussed on following. The 'atd' angle less than 35 degree shows excellent in sports activity and the 'atd' angle shows smart up to 40 degree and normal range from 41 to 45 degrees. Those who have greater than 50 degrees are mentally retarded (Empower Mind, 2012). The present result also related and compared to earlier research by other authors, which reported that normal angle 'atd' range was 30° to 65° (Vashist *et al.*, 2009). The present investigation has clearly revealed that there similar 'atd' angles in dermatoglyphic patterns between right and left hands of all India varsity runner players.

### Conclusion

The present study concluded that the middle distance runners have better 'atd' angle when compare with sprinters and long distance runners. The long distance runners have better 'atd' angle as compared sprinters. The 'atd' angle shows similar between right and left hand irrespectively of different pace runners. Hence, the selections of runners based on 'atd' between 35<sup>0</sup> to 45<sup>0</sup> will be suitable for track events.

### Implication

As the norms of 'atd' angle on selection of athletes to sports participation, the track runners have better ability to prove the performance intensity in the competition. The lesser 'atd' degree will have more aerobic capacity than higher angle. Therefore, in future the coaches and sports trainers have to select the players based on the dermatoglyphic tri-radial norms for sports selection. Whereas there may be the training impact and other influences on high achievers to obtain the goal. The further researchers on the clusters of studies on 'atd' angle will make more clarity.

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