

## DERMATOGLYPHIC VARIATION, AS GENETIC MARKER ON PLANTAR SURFACE: POTENTIALITY FOR SPORTS MEN

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### ABSTRACT

Dermatoglyphic features of feet are compared between sports men and non-sports men with in the age group 16-23 years. Various morphometric and dermatoglyphic parameters were considered. The result analyzed, showed high variation and greater number of loops at distal thenar of the sports men than in non-sports men. This might be genetic marker for prognostication of potentiality in sports men.

**Keywords:** Dermatoglyphics, thenar, loop, sports, potentiality.

### INTRODUCTION

Talent of sports needs to be identified at very early age, so as to be exposed to specialized coaching from a young age (Singh and Kumar, 2013). Early prognostication of sports gifts of children is possible by using genetic markers. Genetic marking can be explained by the fact of gene which codes for certain feature and manifests as phenotype. With revealing of sign marker it is possible to judge not only about the presence but also about the absence of researched morphological feature or, movement abilities of a person.

Study of genetic marker started in 19<sup>th</sup> century by Sir Francis Galton and he was the first person to propose that there is a connection between human prints and genetics (Manoj, K. P, 2014).

Ridge pattern development takes place in mother's womb at 13<sup>th</sup> week of gestation and each person's ridge pattern varies both in palmar and plantar surface.

Finding on palmar dermatoglyphics of athletes and non-athletes showed significant difference in selected dermatoglyphic traits. (Sharma and Shukla's 1981)

Study on dermatoglyphic pattern in sports and non-sportsmen revealed the dominance of loop finger pattern and significantly greater inter tri radial distance on sportsmen (Verma and Amaresh 1986)

### OBJECTIVE

In the present study, an attempt was made to find the possible reason for jumping ability based on the plantar surface of basketball and volley ball players.

### MATERIALS AND METHODS

A survey was done to collect the foot prints of 35 sports men of age 16-23 years at Kanteerava stadium with the help of Youth Center Academy, Bengaluru. And a comparative study was done by taking 35 non-sports men with the same age group. The morphometric parameters include length of the foot, length of the curve and height of the curve. Later the foot print was taken by applying ink on the plantar surface to study the dermatoglyphic parameters, such as distance between distal and proximal thenar, length of the height of the arch and the pattern formed at distal thenar. These parameters were measured using measuring scale, in which the range of measurement in centimeter was taken on 'x axis' and frequency on 'y axis'. Finally the data was recorded and statistically analyzed.

### RESULT AND DISCUSSION

The morphometric analysis of foot of the sports men and non-sports men revealed that, the frequency of length of the foot ranging from 27-29 cms were more in sports men, where as in case of non-sports men the frequency with

length of 24-26cms are more, fig(1.1),(plate-1). Thus sports men on right foot and left foot showed S.D of 1.46 and 4.93 where as the S.D of non sports men showed 1.36 and 1.37 on right and left respectively, table(1).

From fig (1.2), (plate-2), length of the curve showed frequency in sports men ranging from 15-17cms which are more when compared to non-sports men with frequency of 14-16cms. The SD for the same showed 1.2 on right and 1.06 on left foot of the sports men where as the non sports men showed 3.34 and 3.40 on right and left foot respectively, table (1).

The height of the curve, showed frequency ranging from 15-17cms more in sports men, but in case of non-sports men the frequency was between 14-16cms, fig (1.3), (plate-3). Thus the sports men showed SD of 1.15 and 1.10 on right and left foot, similarly 0.63 and 0.55 value was observed in non sports men on right and left foot, table (1).

Thus by above analysis we can conclude that the morphometrical parameters such as length of the foot, length of the curve and height of the curve are comparatively more in case of sports men than in case of non- sports men.

Where as in case of dermatoglyphic analysis, the distance between the distal and proximal thenar of sports men showed frequency ranging from

14-16cms more than non-sports men with 10-15cms, fig (2.1), (plate-5).The SD for sports men on right and left foot showed 1.24 value and non sportsmen showed 1.66 and 1.88 on right and left foot respectively, table (1).

The length of the peak of the arch showed frequency ranging from 5-7cms are more in sports men but is case of non-sports men it is 4-6cms, fig (2.2), (plate-6). The SD for sports men on right and left foot showed 0.99 value and non sportsmen showed 0.89 and 0.87 on right and left foot respectively, table (1).

The above dermatoglyphic parameters such as distance between distal and proximal thenar and the length of the peak of the arch showed that the dematoglyphic measurements of sports men were comparatively more than in non-sports men.

Not only that, it was observed that the frequency of number of loop patterns, (plate-4), in distal thenar region of sports men foot were more compared to that of non-sports men.

These result are found to coincide with the report of Verma and Amaresh(1986), in which the loop pattern is considerably high in sports men when compared to that of normal men. Thus dermatoglyphic factors may be one of the reasons responsible for the jumping ability of sports men.

**Table 1: Dermatoglyphic analysis showing SD and SE for sports men and non-sports men**

Parameters	Sports men				Non- sports men			
	Standard deviation (SD)		Standard error (SE)		Standard deviation (SD)		Standard error(SE)	
	Right foot	Left foot	Right foot	Left foot	Right foot	Left foot	Right foot	Left foot
Length of the foot	1.46	4.93	0.24	0.83	1.36	1.37	0.23	0.23
Length of the curve	1.2	1.06	0.20	0.18	3.34	3.40	0.56	0.57
Height of the curve	1.15	1.10	0.19	0.18	0.63	0.55	0.10	0.09
Distance between distal and proximal thenar	1.24	1.24	0.20	0.20	1.66	1.88	0.28	0.31
Length of the peak of the arch	0.99	0.99	0.16	0.16	0.89	0.87	0.15	0.14

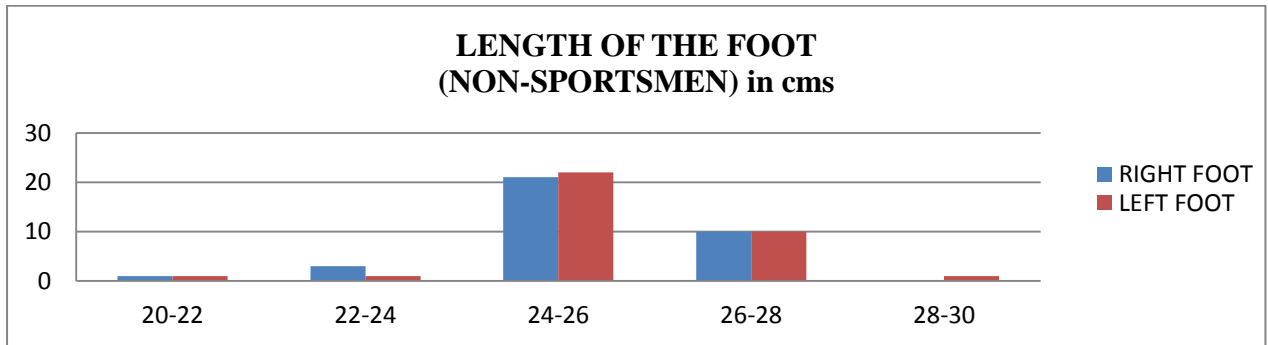
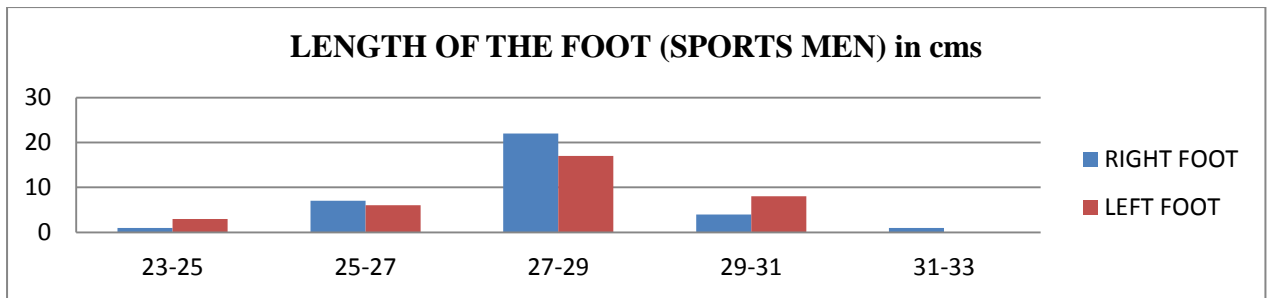


Fig. 1.1:

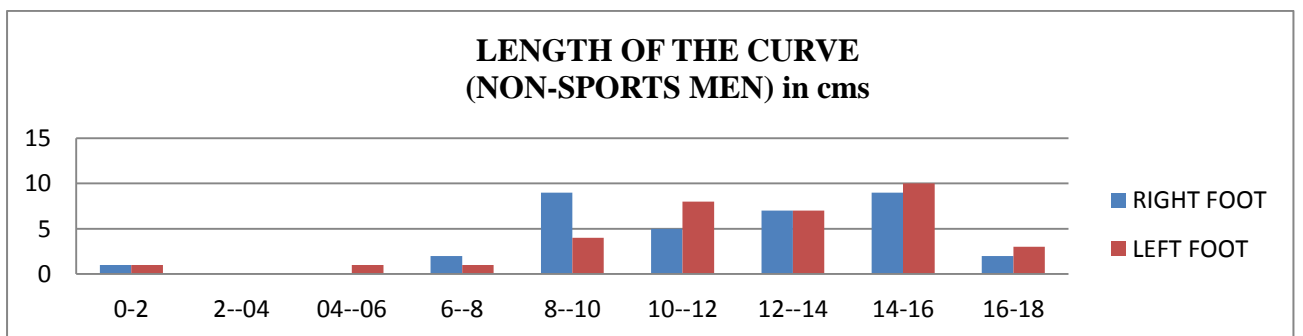
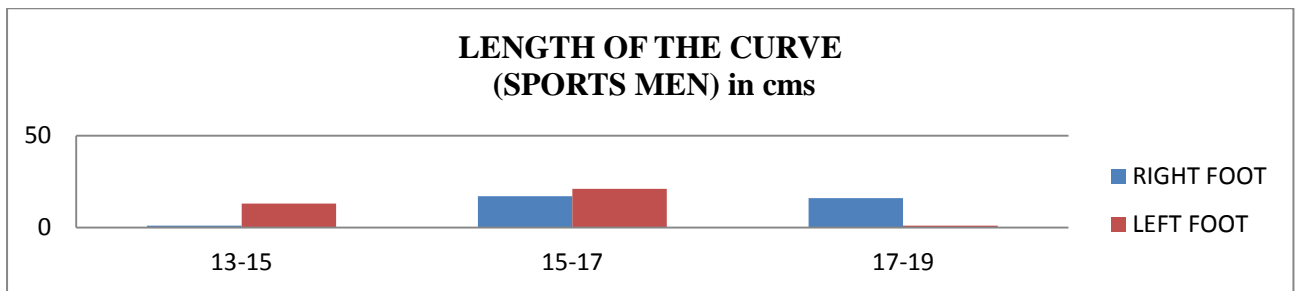


Fig. 1.2:

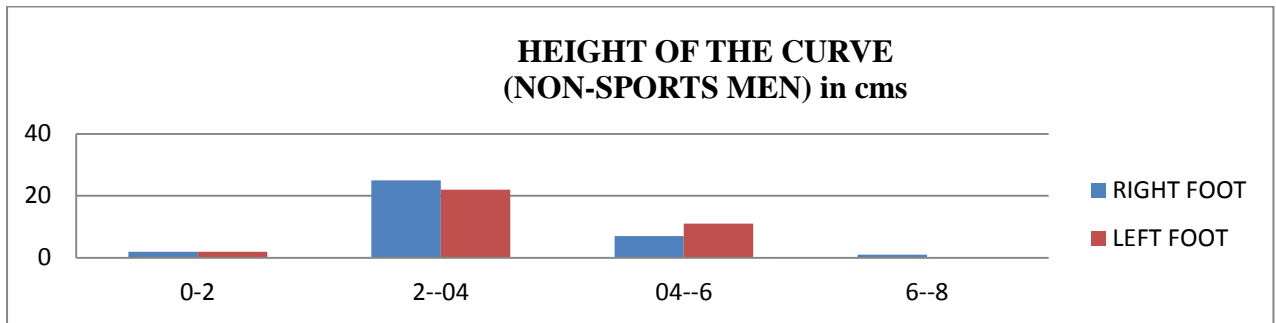
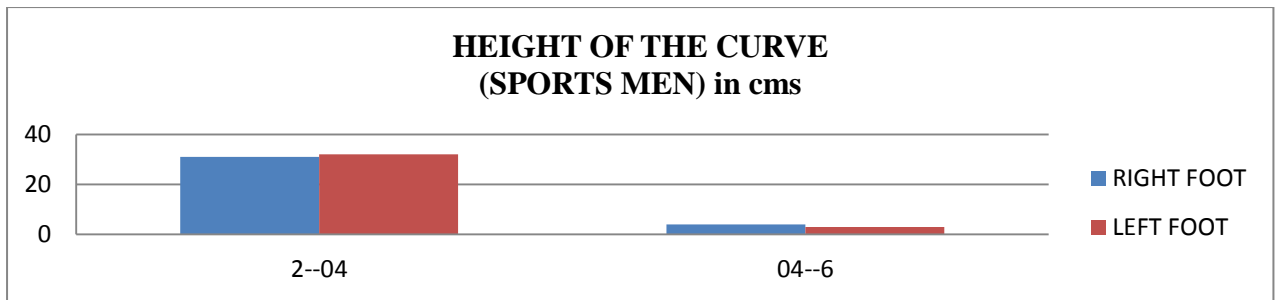


Fig. 1.3:

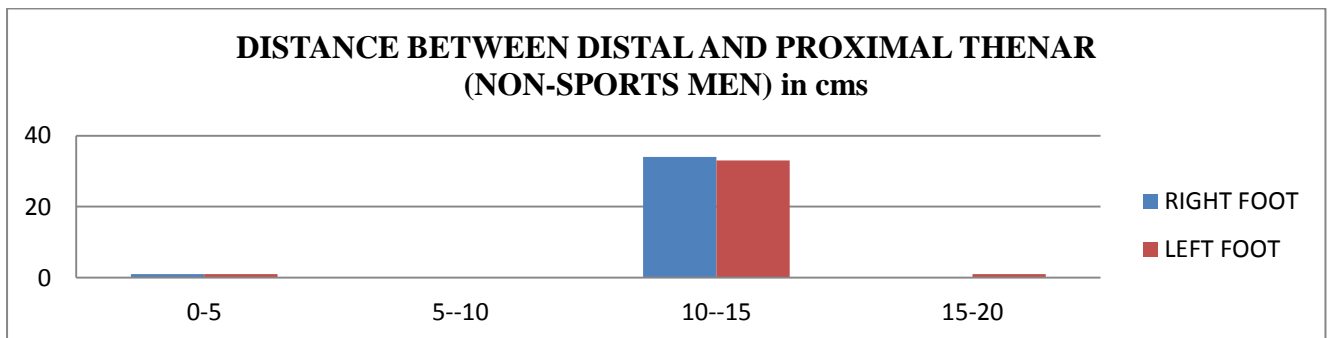
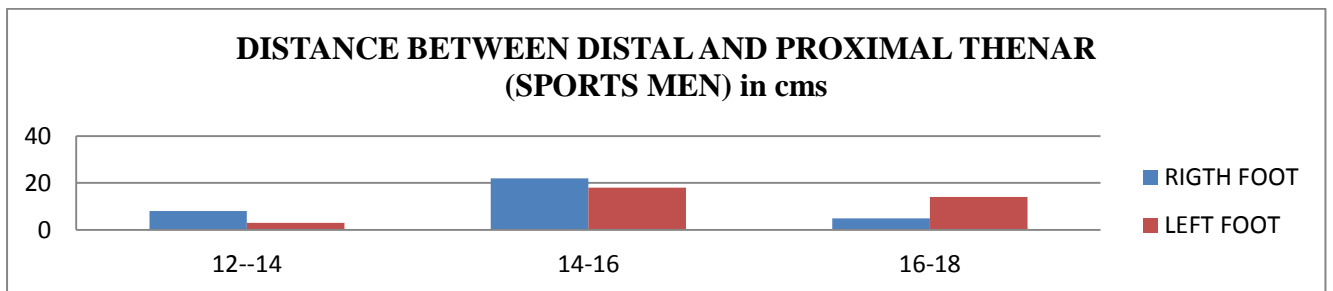


Fig. 2.1:

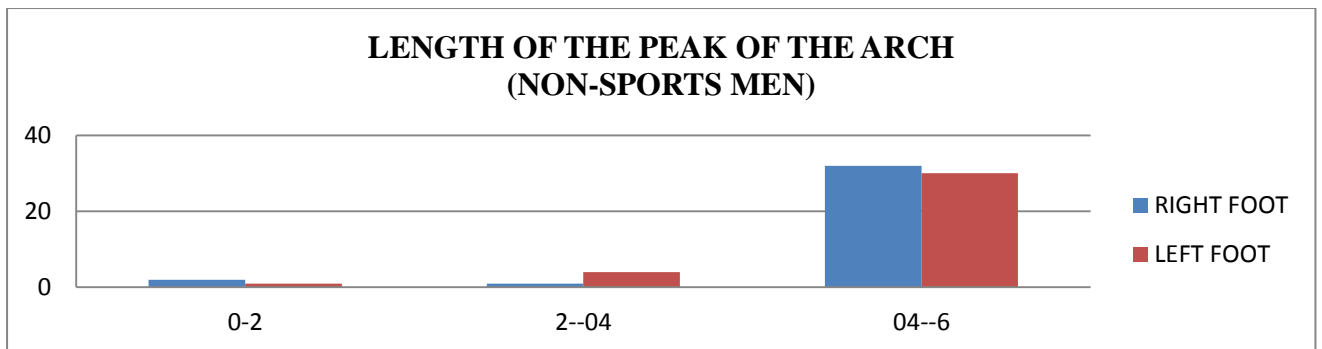
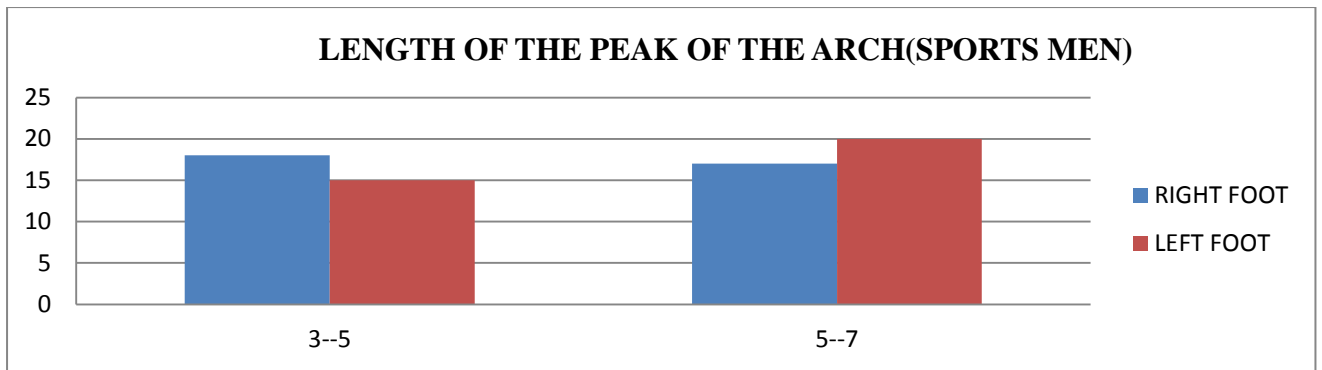


Fig. 2.2:



Plate-1 (Length of the foot)



Plate-2 (Length of the curve)



Plate-3 (Height of the curve)



Plate-4 (loop pattern)

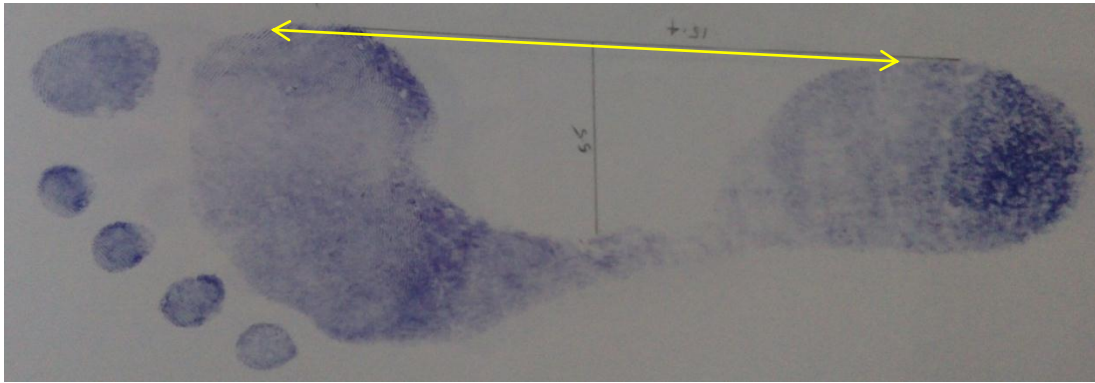


Plate-5 (Distance between distal and proximal thenar)

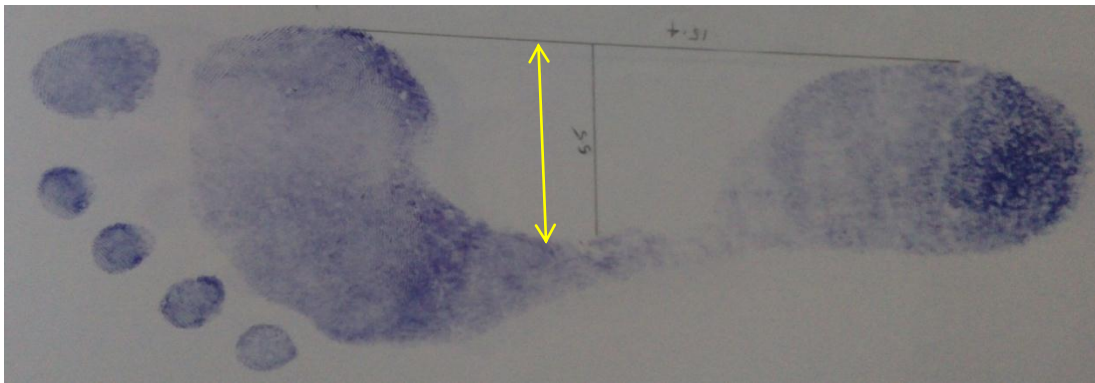


Plate-6 (Length of the peak of the arch)

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