

## Different Strikers Positions in Somatotype of Soccer Players

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### ABSTRACT

Football is ubiquitous across the globe and has been part of Olympic competition since 1900. In a team sport such as soccer, the requirement for frequent changes in movement, speed, direction, and technical tasks features an activity profile that is intermittent in nature. The study aimed to assess the **SOMATOTYPE OF SOCCER PLAYERS ACCORDING TO THEIR DIFFERENT ATTACKING POSITIONS**. For this purpose total 50 male Striker footballers from Punjab state was selected as a subject. The age of the subjects selected for the study have been between 18 to 26 years. Each individual was somatotyped with the help of the Heath-Carter anthropometric somatotype method (Carter and Heath, 1990). The individual component ratings were computed using the equations and the X and Y coordinates for each subject were calculated using the formulae given by Carter et al. (1983). The observations revealed that the somatochart, for the age groups 18, 20, 21, 22, and 26 years, the somatoplots lie in the mesomorphic ectomorph sector. Whereas for the rest of the age groups i.e. 19, 23, 24, and 25 years, the somatotypes that can be observed are located in the balanced ectomorph region of the somtoplots.

**KEYWORDS:** Somatotype, Endomorph, Mesomorph, Ectomorph

### INTRODUCTION

Football is ubiquitous across the globe and has been part of Olympic competition since 1900. It is played in practically every nation at varying levels of competence for fun, as a career, a means of keeping fit or simply a recreational pursuit (Reilly, 1996). In a team sport such as soccer, the requirement for frequent changes in movement, speed, direction, and technical tasks features an activity profile that is intermittent in nature (Stolen et al 2005). It is well known that understanding the specific requirements of elite-level soccer playing can provide insightful information regarding what is truly needed for competitive success in that sport. Particularly, anthropometric measures of body composition, and both physiological and physical capabilities, including cardio respiratory endurance, muscular strength, muscular endurance, and flexibility, are generally assessed through testing of the soccer players (Stolen et al. 2005; Canhadas et al 2010). These measures can complement each other, and their combination may provide soccer coaches, strength and conditioning coaches, and athletic trainers with better knowledge of those characteristics required for successful participation at the elite level. Specific anthropometric and physiological characteristics of the players may be important in both the talent identification and development processes (Reilly et al 2000). Previous studies on soccer players have disclosed significant differences in anthropometric and fitness measures between playing levels (Gissis et al. 2006; Rebelo et al 2013; Vaeyens 2006).

For instance, knowing the anthropometric and physical attributes of soccer players relative to competitive level, playing position and age group would be beneficial for the stakeholders.

Somatotyping, a technique of classifying human physique, has been first introduced and developed by Sheldon and his associates during the thirties. In the words of Prof. D. F. Roberts of Newcastle upon Tyne, "The combination of names, Health-Carter is justifiably as well known to those working on physique as is that of Hardy-Weinberg to those in population genetics." Sheldon et al. (1940, 1954) gave the first workable method to quantify human physique on the basis of its continuous distribution in the human race. It was designated as somatotype. It emphasizes the immutability of somatotypes under mild to moderate environmental and nutritional insults or with age.

The earliest attempt at classification of human physique with the help of body measurements was done by an Italian physician Viola during the early part of the twentieth century. In 1940, William H. Sheldon, S.S. Stevens and W.B. Tucker appreciated that the human physique is a continuously distributed characteristic. They successfully devised a method to analyze and quantify human body from called somatotyping. According to Sheldon, somatotype shows the variations in human morphology which is represented on a continual of variation, and it may be considered as a step towards human taxonomy. Sheldon recognized three basic components of physique, viz., endomorphy, mesomorphy, ectomorphy. Each individual has varying degrees of development of these three components. After Sheldon's method of somatotyping, there have been many attempts to make it simpler, easily executable and more objective. Later on, Heath and Carter in 1967 gave their own modified method of somatotyping. This method, however, differs from that of Sheldon's in the sense that it evaluates the body form or physique at the given time compared to the unchanging somatotype of Sheldon.

Gontarev, et. al. (2016) analyzed measurements of 486 young soccer players who play in teams of the First national league, with an average age  $15.8 \pm 1.4$ . The obtained results can serve as normative anthropometric indicators for regular sports medical examinations of young players in our country, or can be used as a template for comparison of the anthropometric and somatotype information of young players at a similar level of different countries. (Sukanta Saha et. al. 2014). Study was to describe the morphological, somatotype, and body composition characteristics of Indian university level football players based upon their field position. They found that University level Indian footballers were average in height, weight, and muscle mass. Malousaris, GG., et. al. (2008) Researcher evaluates the study "Somatotype, size and body composition of competitive female volleyball players." Significant differences were found among athletes of different playing positions which are interpreted by their varying roles and physical demands during a volleyball game.

## **MATERIAL AND METHODS**

Aim of the present study is to assess the **SOMATOTYPE OF SOCCER PLAYERS**

**ACCORDING TO THEIR PLAYING POSITIONS.** For the purpose of the study, total number of 50 male footballers of Punjab state was selected as a subject. The age of the subjects selected for the study have been between 18 to 26 years. The data was obtained from various college students.

### VARIABLE AND CRITERION MEASURE

Somatotyping: Each individual was somatotyped with the help of the Heath-Carter anthropometric somatotype method (Carter and Heath, 1990). The individual component ratings were computed using the equations and the X and Y coordinates for each subject were calculated using the formulae given by Carter et al. (1983).

### STATISTICAL CONSIDERATION

SPSS was utilized for interpretation of the data. The results were analyzed statistically by applying 't' test.

### RESULTS

Different types of descriptive statistic such as mean and standard deviation was computed to describe each variable statistically. The level of significance was set at .05. Its results have been depicted in the following tables.

**TABLE –1**  
**Mean and SD forendomorphy ranges of strikers football player of Punjab state of age group ranging 18 to 26 years**

AGE GROUP	N	MEAN	S.D	RANGE	
				MAX	MIN
18	5	1.95	0.44	2.42	1.25
19	4	2.08	0.64	2.68	1.33
20	4	1.98	0.22	2.10	1.64
21	8	1.70	0.68	2.61	0.77
22	8	1.70	0.62	2.96	1.21
23	5	2.00	0.37	2.50	1.65
24	6	1.67	0.56	2.25	0.88
25	5	1.43	0.60	2.26	0.84
26	5	1.52	0.51	2.25	1.02

The table below showcases a range varying between a minimum value of 0.77 at 21 years to a maximum of 2.96 at 22 years of age. Besides, from the table it is also evident that the minimum mean value (1.43) of endomorphic component was found at 25 years and the maximum mean value (2.08) was seen at 19 years. For strikers, the mean value shows an initial increase and then a fluctuating increasing and decreasing pattern. Maximum increase in endomorphy can be seen between 22 to 23 years. The standard deviation values vary from a minimum value of 0.22 at 20 years to maximum 0.68 at 21 years.

**Table-2**

**Mean and SD for mesomorphy ranges of strikers football player of Punjab state of age group ranging 18 to 26 years**

AGE GROUP	N	MEAN	S.D	RANGE	
				MAX	MIN
18	5	2.62	0.31	3.02	2.22
19	4	1.55	0.70	2.46	0.81
20	4	2.34	0.87	3.49	1.40
21	8	1.87	0.80	3.47	0.72
22	8	2.05	0.99	2.97	0.25
23	5	1.96	1.34	4.09	0.71
24	6	1.48	1.06	2.40	-0.40
25	5	1.24	0.69	2.10	0.43
26	5	2.10	0.97	2.90	0.46

From the table, it is quite clear that the minimum mesomorphic component value (-0.40) was observed at 24 years and the maximum mesomorphic component (4.09) was recorded at 23 years. As far as the mean value is concerned, minimum mean value (1.24) was observed at 25 years and maximum value (2.62) was seen at 18 year. In case of strikers, the mean value shows an alternating increasing decreasing pattern with minor fluctuations. Maximum increase in the mean value of 0.86 mesomorphic units was recorded between 25 to 26 years. The standard deviation value ranges from a maximum of 1.34 at 23 years to a minimum of 0.31 at 18 years.

**Table – 3**

**Mean and SD forectomorphy ranges of strikers football player of Punjab state of age group ranging 18 to 26 years**

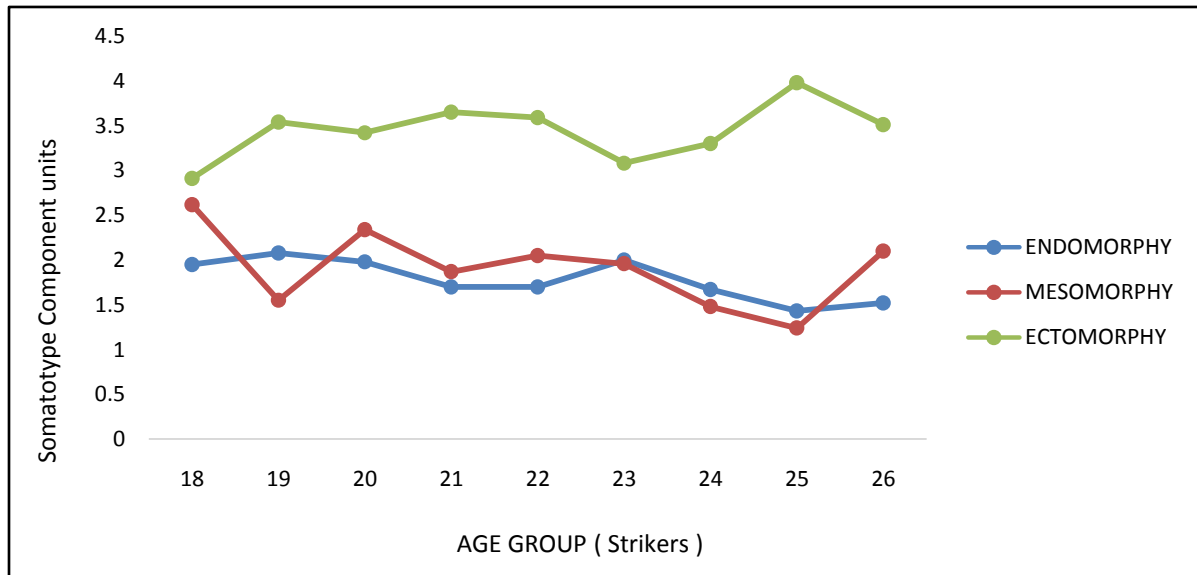
AGE GROUP	N	MEAN	S.D	RANGE	
				MAX	MIN
18	5	2.91	0.73	4.01	2.00
19	4	3.54	1.21	4.48	1.91
20	4	3.42	0.96	4.85	2.75
21	8	3.65	1.20	5.79	2.23
22	8	3.59	0.93	4.97	2.55
23	5	3.08	1.83	4.59	0.31
24	6	3.30	1.37	5.09	1.67
25	5	3.98	1.52	5.73	1.91
26	5	3.51	1.50	5.82	2.04

As can be seen from the table, the maximum mean value of ectomorphy was found to be 3.98 at 25 years and the minimum of 2.91 was registered at 18 years. The mean value shows alternating increasing and decreasing pattern from 18 to 22 years and thereafter it keeps on increasing till 25 years. Maximum increase in the ectomorphic component is seen between 23 to 25 years followed by

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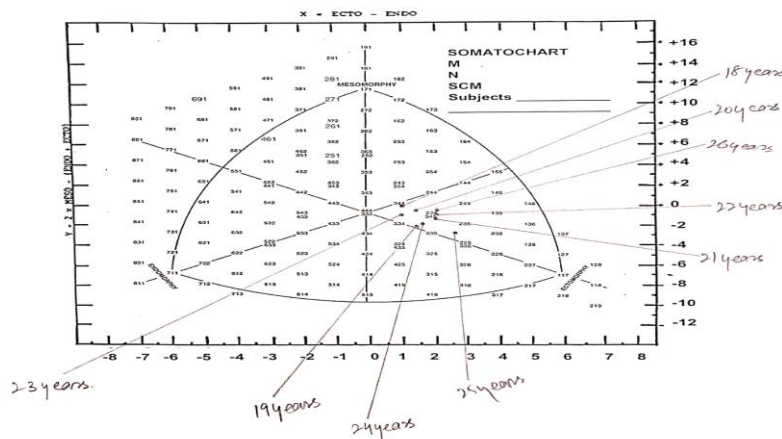
maximum decrease between 22 to 23 years. The standard deviation values for ectomorphy ranges from a minimum of 0.73 at 18 years and a maximum value of 1.83 at 23 years.

**Graph – 1: Distance curve of Endomorphy, Mesomorphy and Ectomorphy of 18-26 years of Strikers**



The figure –1 depicts the distribution of mean somatoplots of the various age groups of male football players of the Punjab area who are strikers. It becomes evidently clear from the figures that the mean somatoplot is located in the mesomorphic ectomorph sector of the somatochart and most of the somatoplots fall in the balanced ectomorph sector and mesomorphic ectomorph sector of the somatochart. From the somatochart, it is evident that for the age groups 18, 20, 21, 22, and 26 years, the somatoplots lie in the mesomorphic ectomorph sector. Whereas for the rest of the age groups i.e. 19, 23, 24, and 25 years, the somatotypes that can be observed are located in the balanced ectomorph region of the somtoplots.

**Graph - 2: Somatochart showing Meansomatoplots of male strikers of football players of Punjab areas of age group ranging 18 to 26 years**



The Graph 2 depicts the distribution of mean somatoplots of the various age groups of male football players of the Punjab area who are strikers. It becomes evidently clear from the figures that the mean somatoplot is located in the mesomorphic ectomorph sector of the somatochart and most of the somatoplots fall in the balanced ectomorph sector and mesomorphic ectomorph sector of the somatochart. From the somatochart, it is evident that for the age groups 18, 20, 21, 22, and 26 years, the somatoplots lie in the mesomorphic ectomorph sector. Whereas for the rest of the age groups i.e. 19, 23, 24, and 25 years, the somatotypes that can be observed are located in the balanced ectomorph region of the somatoplots.

**Table – 4**

**Mean Somatotype score for strikers football player of Punjab state of age group ranging 18 to 26 years**

AGE GROUP	N	MEAN SOMATOTYPE	X Co-ordinate	Y Co-ordinate
18	5	1.9-2.6-2.9	1.0	0.4
19	4	2.1-1.6-3.5	1.4	-2.4
20	4	2.0-2.3-3.4	1.4	-0.8
21	8	1.7-1.9-3.7	2.0	-1.6
22	8	1.7-2.1-3.6	1.9	-1.1
23	5	2.0-1.9-3.0	1.0	-1.2
24	6	1.7-1.5-3.3	1.6	-2.0
25	5	1.4-1.2-4.0	2.6	-3.0
26	5	1.5-2.1-3.5	2.0	-0.8

## DISCUSSION OF FINDINGS

It is evident from the results of the study that on the basis of the achieved results of this research, it can be concluded that there are no differences in somatotype components among other players who play in different positions on the team, except for the goalkeeper. The trend in modern football is increasingly focused on improving the performance of all players who play on all positions that will allow more movements of attacking players. The undertaken roles among juniors and elite soccer players according to their positions are related to their physical performance. Somatotype is a method that estimates the physical profile in athletes. No single method is adequate to determine physical profile (Orhan, et.al.). Appropriate guidance, based on individual differences and development, should be given priority (Orhan, et.al.).

Evaluation of somatotype components in this study indicate that there are no specifics in somatic typology of players who play in different positions on the team. Bearing in mind that football is one of the most popular sports in the world, during the selection of talented players, tests for assessing physiological and motor performance, together with anthropometric and somatotype research should be used and the players' development should be monitored.

In the other somatotype components there are statistically significant differences among the players who play on different positions in the team. Our results suggest that the selection of players in football for individual playing positions must be based on their somatotype characteristics.

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Coaches should have a good knowledge of general and specific tasks that the player should perform in the game. The data can also be used as a template to compare somatotype data of young players from different countries.

### CONCLUSION

The following conclusions were drawn:

*The observations revealed that the somatochart, for the age groups 18, 20, 21, 22, and 26 years, the somatoplots lie in the mesomorphic ectomorph sector. Whereas for the rest of the age groups i.e. 19, 23, 24, and 25 years, the somatotypes that can be observed are located in the balanced ectomorph region of the somtoplots.*

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