Comparison of Anthropometric Variables of Various Playing Positions in Football

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Abstract

The purpose of the study was to know about the comparison of anthropometric variables of various playing positions in football. The study was conducted among 34 male football players (inter college level) from Punjabi university Patiala presented. The subjects were thoroughly aware with the testing procedure as well as the purpose and significance of the study. Subjects were made aware about the conduct of the study and related information was given by the researcher. The variables selected for the study are anthropometric respectively. They are Height, Weight, Humerus bicondylar and Femur bicondylar. Further the data were analyzed to find out the significant differences among the groups. 't'-test statistical technique was used to analyze the significant differences and the level of significance was set at 0.05 level for testing the hypothesis. Further the data were analyzed to find out the significant differences among the groups.

The results revealed that there was insignificant difference among the groups in Weight, Humerus bicondylar and Femur bicondylar. However there was significant difference between defender and midfielder in Height.

INTRODUCTOIN

The first application of anthropometry in physical education began with (Eveleth 1976) when he under took a study of anthropometrical measurements of Amherst college, men, leading to the publication of anthropometric tables almost annually for 40 yrs. The aim of anthropometry was depicted by Hitch cock as ascertaining the ideal on typical man as a guide in fostering the development of normal on 6 yrs of examining Harvard students. From 1885 to 1900 anthropometrical studies were conducted at different collegiate institution involving close to 8000 men and women. In 1890, Beaver published what proved to be the pioneer American book on physical measurement of the body, it was subsequently revised twice Anthropometric measurement for assessment of physical status was expanded quite naturally to include consideration of the body, it types to consideration of body types and the relation of physique to one's health, immunity from disease, posture, physical performance, and personality qualities. It soon became recognized that a single ideal physique was both impractical and unrealistic. Actually Hippocrates first realized this fact and classified human beings according to two basic physiques-long and then, or short and thick.

Albert et al (2013) evaluate the study "Anthropometric characteristics of elite junior tennis players." The aims of this study were to describe the anthropometric characteristics of elite male and female junior tennis players, to compare the anthropometric variables of the first 12 elite junior tennis players on the ranking with the lower ranked players, and to establish an anthropometric profile chart for elite junior tennis players. There were no

significant differences in height and weight between the first 12 and the lower ranked boys, while the first 12 girls were significantly taller than the lower ranked girls ($p = 0.009$). Significant differences were found for humeral and femoral breadths between the first 12 and the lower ranked girls ($p = 0.000$; $p = 0.004$, respectively.

OBJECTIVES

To find out whether the inter college level Football players playing in different positions differed in the selected anthropometric parameters.

PROCEDURE AND METHODOLOGY

The study was conducted among 34 male football players (Inter College level) from Punjabi university Patiala presented. The subjects were thoroughly acquainted with the testing procedure as well as the purpose and significance of the study. Subjects were made aware about the conduct of the study and relevant information was given by the researcher. Further the data were analyzed to find out the significant differences among the groups. 't'-test statistical technique was used to analyze the significant differences and the level of significance was set at 0.05 level for testing the hypothesis. Further the data were analyzed to find out the significant differences among the groups.

TOOLS

Anthropometric Instrument

A number of instruments have been devised by anthropologists for taking accurate measurements on the living as well as on the skeleton. The use of proper equipment is most essential for anthropometric measurements. In the present study researcher will use the following instruments.

1. Weighing Machine
2. Anthropometric Rod
3. Sliding Caliper

Collection of Data

The field work for collection of data was conducted in the month of November 2013 from Punjabi university, Patiala. Subject, who were involved in the sports of football at inter college level were included in the study by the researcher.

1. Body weight:

Purpose: To measure the weight of the subject.

Instrument: Weighing machine. The instrument of choice for laboratory conditions in "person weighing machine" manufactured by M/S Avery Limited, India. The machine is calibrated with accuracy of 50 grams.

Procedure: The body weight is ideally taken on a standard weighing machine. The weight of all subjects was taken by removing all the clothes from the body except the

shorts and shirts. The pointer of weighing machine was set at zero. The subject was said to stand bare footed on the weighing machine.

Scoring: Weight of the subject is measured in kilograms.

2. Height (Stature):

Purpose: To measure the Height of the subject.

Instrument: Anthropometric rod is the most used instrument for many of the anthropometric measurements on the living beings. It is used to take height measurements as well as transverse breadths of the body. It consists of four segments which when join together from a rigid bar of 200 cm. There is a fixed sleeve on the top of the rod and adjustable graduated cross bar passes through it. There is also movable sleeve with an adjustable graduated cross bar, which registers the height measurements.

Procedure: The vertex point is the highest point on the head when it is in a horizontal plane. For measuring height the subject was asked to stand bare footed and erect with both heels touching each other, with hips and upper scapular part touching the wall. The subject was asked to look straight so that his visual axis parallel to the surface of the floor. The anthropometric rod was held vertical in front of the body in mid-segital plane and the horizontal movable arm of the rod was brought down on to the vertex point. The height was recorded with the help of anthropometric rod.

Scoring: Height of the subject measured in centimeters.

3. Humerus Diameter:

It measures the straight distance between the two outermost points on the condyles of the lower end of Humerus.

Instrument: Sliding caliper is used for taking shorter breadths. It consists of 25 cm. long straight bar. The arms are projected to an equal distance on both the sides of the scale. They end in sharp points on one side and have blunted ends on the opposite. The sharp ends are used for taking measurements on the skeletons whereas the blunt ends are used for measuring the living.

Usually, the caliper is graduated up to mm. calipers with venire have been devised for taking more accurate measurements. They also have adjustable arms which enable us to take projective measurements

Procedure: The subject was asked to raise his arm to the horizontal plane and bent at right angle. The measurement across the width of the lower end of the humerus was recorded by pressing the arms of the calipers.

Scoring: Humerus diameter is measured in centimeters.

4. Femur Diameter:

It is the straight distance between the outermost points of the condylies on the lower end of the femur.

Instrument: Sliding caliper

Procedure: The subject was asked to sit on the bench or chair with his knee flexed at right angle (90 □). The arms of the caliper were applied to compress the soft tissues of the epicondyles of the fumer.

Scoring: Femur diameter is measured in centimeters.

down freely by the sides. The fold is picked up for measurement immediately superior to the iliac crests at the mid-auxiliary line.

Scoring: Suprailiac skinfold is measured in millimeters.

STATISTICAL ANALYSIS

Table no.1
Mean, SD and 't' values of selected Height variable between inter college Defenders and Midfielders in football

COMPONENTS	GROUP	MEAN	S.D.	t- value
Height (cm)	Defenders	176.77	6.09	2.65*
	Midfielders	170.69	5.09	

t-value 2.02 **level of significance 0.5**
d.f.=32

Table no.1 shows the Mean, S.D. and 't'-value for Height of Footballers. The table statistically reveals that the calculated 't'-value of Height 2.65 is greater than tabulated value 2.02 Hence it proves that there was significant difference between Defenders and Midfielders in Height. Furthermore the mean value shows that Defenders were taller than the Midfielders the values of table no.1 are also illustrated in figure no.1.

Figure no.1
Mean, SD and 't' values of selected Height variable between inter college Defenders and Midfielders in football

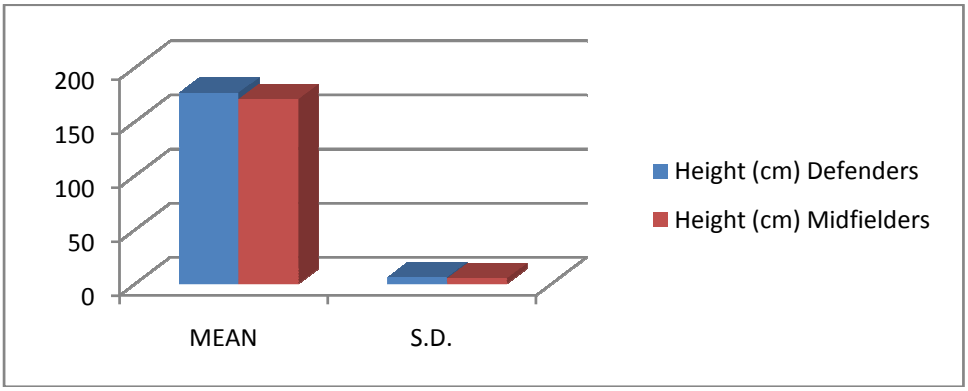


Table no.2

Mean, SD and 't' values of selected Weight variable between inter college Defenders and Midfielders in football

COMPONENTS	GROUP	MEAN	S.D.	t- value
Weight (kg)	Defenders	63.08	5.24	0.17
	Midfielders	63.42	4.08	

t-value 2.02 **level of significance 0.5**

d.f.=32

Table no.2 shows the Mean, S.D. and 't'-value for Weight of Defenders and Midfielders. The table statistically reveals that the calculated 't'-value of Weight 0.17 is less than table value 2.02 Hence it depicts that there was insignificant difference between Defenders and Midfielders in Weight. The values of table no.2 are also illustrated in figure no.2

Figure no.2

Mean, SD and 't' values of selected Weight variable between inter college Defenders and Midfielders in football

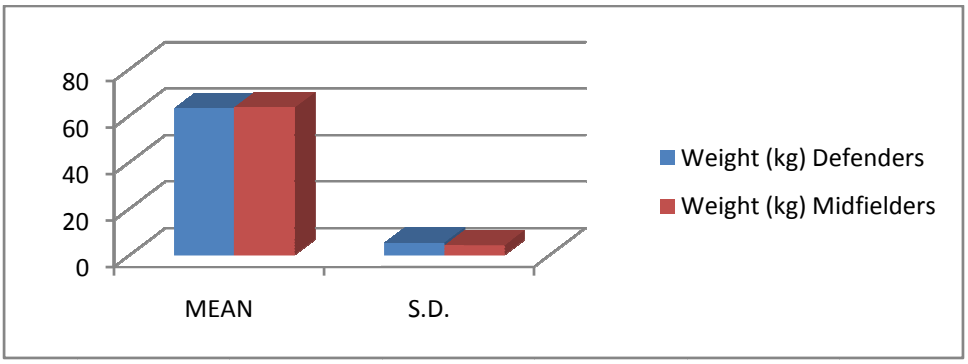


Table no.3

Mean, SD and 't' values of selected Humerus and Femur bicondylar diameter variables between inter college Defenders and Midfielders in football

COMPONENTS	GROUP	MEAN	S.D.	t- value
Humerus bicondylar diameter (cm)	Defenders	7.02	0.52	2.01
	Midfielders	9.40	0.26	
Femur bicondylar diameter (cm)	Defenders	6.62	0.45	0.56
	Midfielders	9.25	0.91	

t-value 2.02 **level of significance 0.5**

d.f.=32

Table no.3 shows the Mean, S.D. and 't'- value for Humerus and Femur bicondylar diameter of Defenders and Midfielders. The table statistically reveals that the calculated

't'-value of Humerus bicondylar diameter 2.01 is less than table value 2.02 Hence it depicts that there was insignificant difference between Defenders and Midfielders in Humerus Femur bicondylar diameter. The table statistically reveals that the calculated 't'-value of Femur bicondylar diameter 0.56 is less than table value 2.02 Hence it proves that there was insignificant difference between Defenders and Midfielders in Femur bicondylar diameter. The values of table no.3 are also illustrated in figure no.3.

Figure no.3

Mean, SD and 't' values of selected Humerus and Femur bicondylar diameter variables between inter college Defenders and Midfielders in football

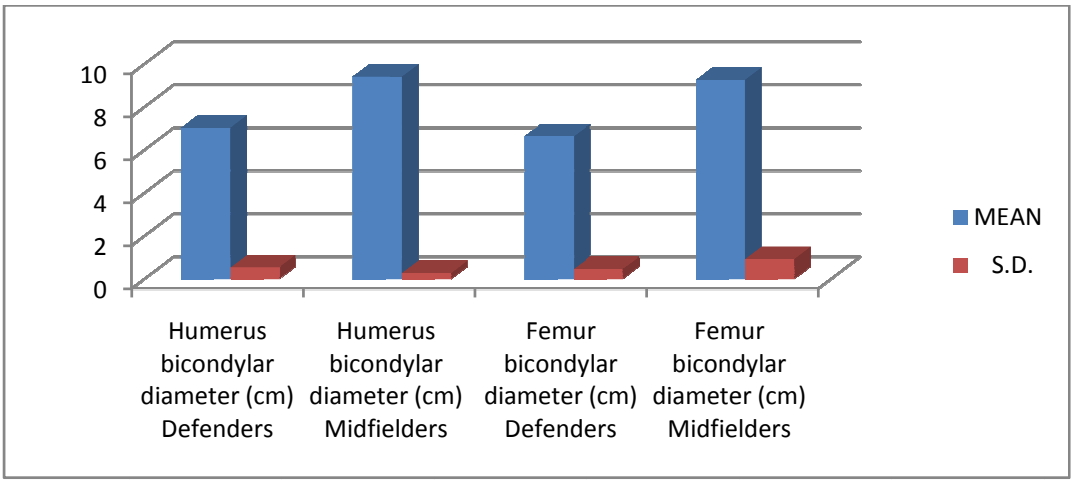


Table no. 4

Mean, S.D. and 't' values of selected Height variable between inter college Midfielders and Striker in football

COMPONENTS	GROUP	MEAN	S.D.	t- value
Height (cm)	Midfielders	170.69	5.09	0.80
	Strikers	172.83	6.91	

t-value 2.02 **level of significance 0.5**

d.f.=32

Table no. 4 shows the Mean, S.D. and 't'-value for Height of Footballers. The table statistically reveals that the calculated 't'-value of Height 0.80 is less than tabulated value 2.02. Hence it proves that there was insignificant difference between Midfielders and strikers in Height. The values of table no. 4 are also illustrated in figure no.4.

Figure no. 4.
Mean, S.D. and 't' values of selected Height variable between inter college Midfielders and Striker in football

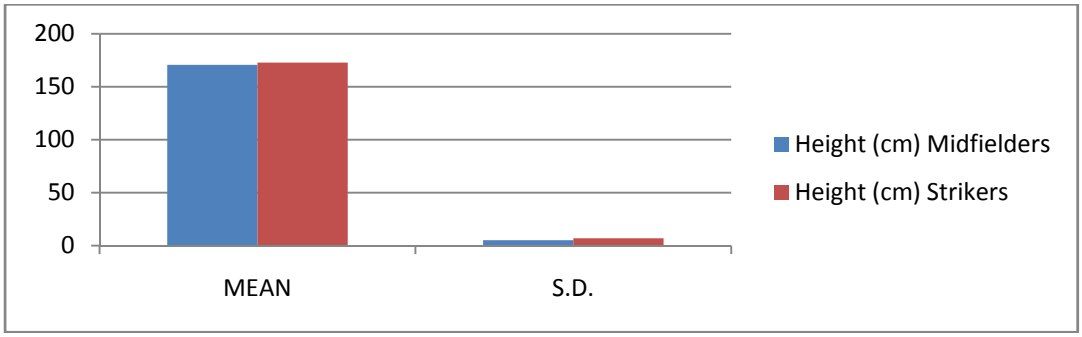


Table no. 5
Mean, S.D. and 't' values of selected Weight variable between inter college Midfielders and Striker in football

COMPONENTS	GROUP	MEAN	S.D.	t- value
Weight (kg)	Midfielders	63.42	4.08	0.62
	Strikers	62.06	5.82	

t-value 2.02 **level of significance 0.5**

d.f.=32

Table no.5 shows the Mean, S.D. and 't'-value for Weight of Midfielders and Strikers. The table statistically reveals that the calculated 't'-value of Weight 0.62 is less than table value 2.02 Hence it proves that there was insignificant difference between Midfielders and Strikers in Weight. The values of table no.5 are also illustrated in figure no.5.

Figure no. 5
Mean, S.D. and 't' values of selected Weight variable between inter college Midfielders and Striker in football

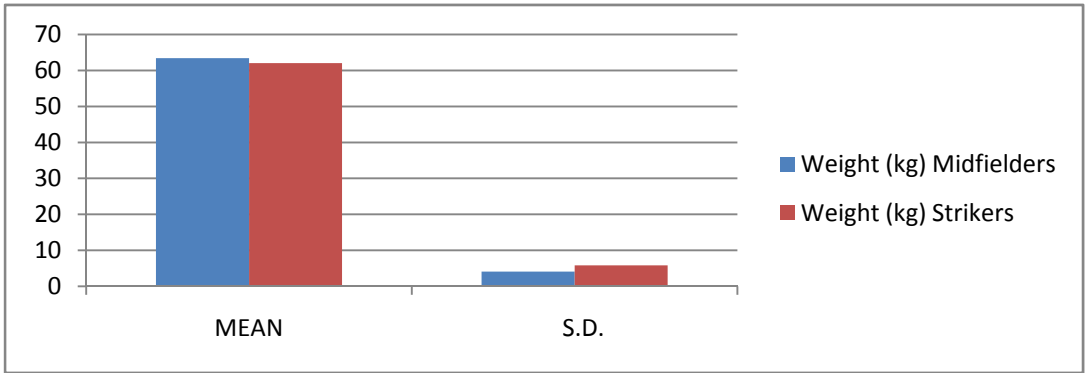


Table no.6
Mean, S.D. and 't' values of selected Humerus and Femur bicondylar diameter variables between inter college Midfielders and Striker in football

COMPONENTS	GROUP	MEAN	S.D.	t-value
Humerus bicondylardiameter(cm)	Midfielders	6.62	0.45	1.11
	Strikers	6.83	0.42	
Femur bicondylar diameter (cm)	Midfielders	9.25	0.91	0.05
	Strikers	9.26	0.41	

t-value 2.02 **level of significance 0.5**
d.f.=32

Table no.6 shows the Mean, S.D. and 't'- value for Humerus and Femur bicondylar diameter of Midfielders and Strikers. The table statistically reveals that the calculated 't'-value of Humerus bicondylar diameter 1.11 is less than table value 2.02 Hence it proves that there was insignificant difference between Midfielders and strikers in Humerus bicondylar diameter. The table statistically reveals that the calculated 't'- value of Femur bicondylar diameter 0.05 is less than table value 2.02 Hence it proves that there was insignificant difference between Midfeilders and Strikers in Femur bicondylar diameter. The values of table no.6 are also illustrated in figure no.6.

Figure no.6

Mean, S.D. and 't' values of selected Humerus and Femur bicondylar diameter variables between inter college Midfielders and Striker in football

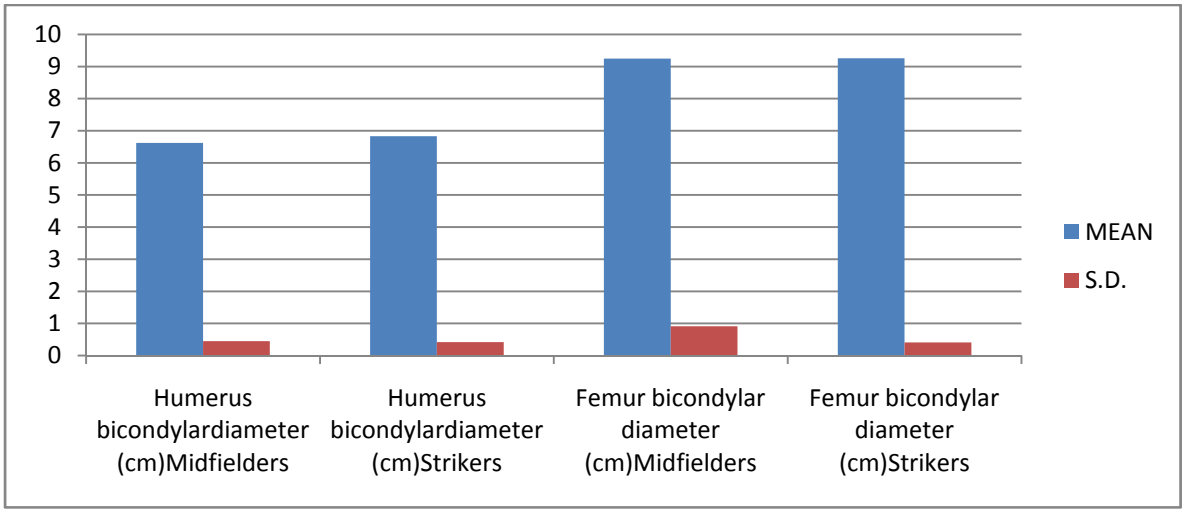


Table no.7
Mean, S.D. and 't' values of selected Height variable between inter college between Defenders and Strikers in football

COMPONENTS	GROUP	MEAN	S.D.	t- value
Height (cm)	Defenders	176.77	6.09	1.40
	Strikers	172.83	6.91	

t-value 2.02 **level of significance 0.5**

d.f.=32

Table no.7 shows the Mean, SD and 't'-value for Height of Footballers. The table statistically reveals that the calculated 't'-value of Height 1.40 is less than tabulated value 2.02. Hence it proves that there was insignificant difference between Defender and Strikers in Height. The values of table no.7 are also illustrated in figure no.7.

Figure no.7
Mean, S.D. and 't' values of selected Height variable between inter college between Defenders and Strikers in football

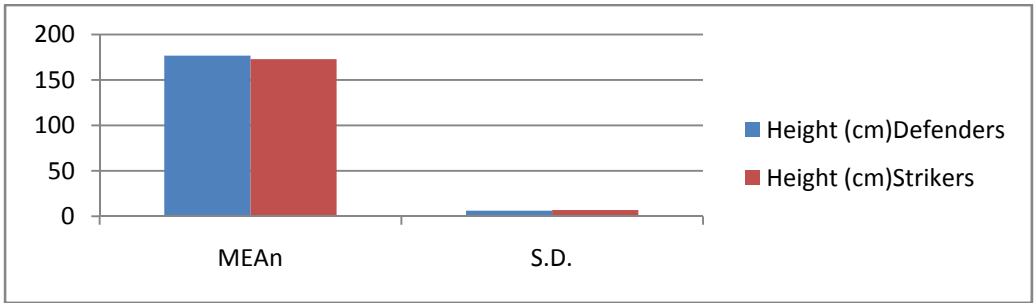


Table no.8

Mean, S.D. and 't' values of selected Weight variable between inter college between Defenders and Strikers in football

COMPONENTS	GROUP	MEAN	S.D.	t- value
Weight (kg)	Defenders	63.08	5.24	0.43
	Strikers	62.06	5.82	

t-value 2.02 **level of significance 0.5**
d.f.=32

Table no.8 shows the Mean, S.D. and 't'-value for Weight of defenders and Strikers. The table statistically reveals that the calculated 't'-value of Weight 0.43 is less than table value 2.02 Hence it proves that there was insignificant difference between Defenders and Strikers in Weight. The values of table no.8 are also illustrated in figure no. 8.

Figure no. 8
Mean, S.D. and 't' values of selected Weight variable between inter college between Defenders and Strikers in football

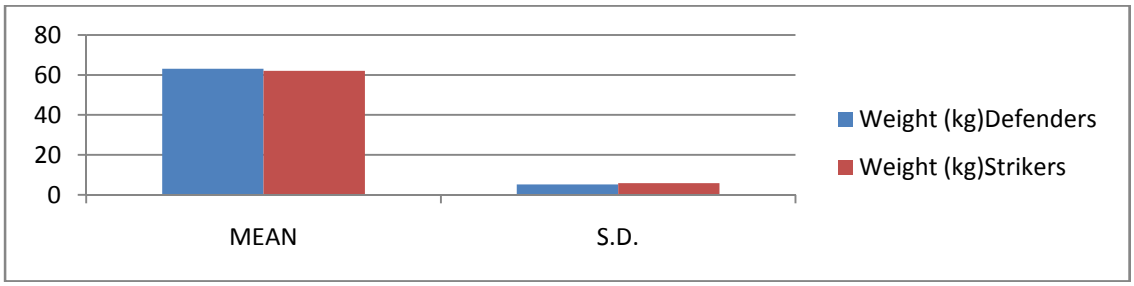


Table no. 9

Mean, S.D. and 't' values of selected Humerus and Femur bicondylar diameter variables between inter college between Defenders and Strikers in football

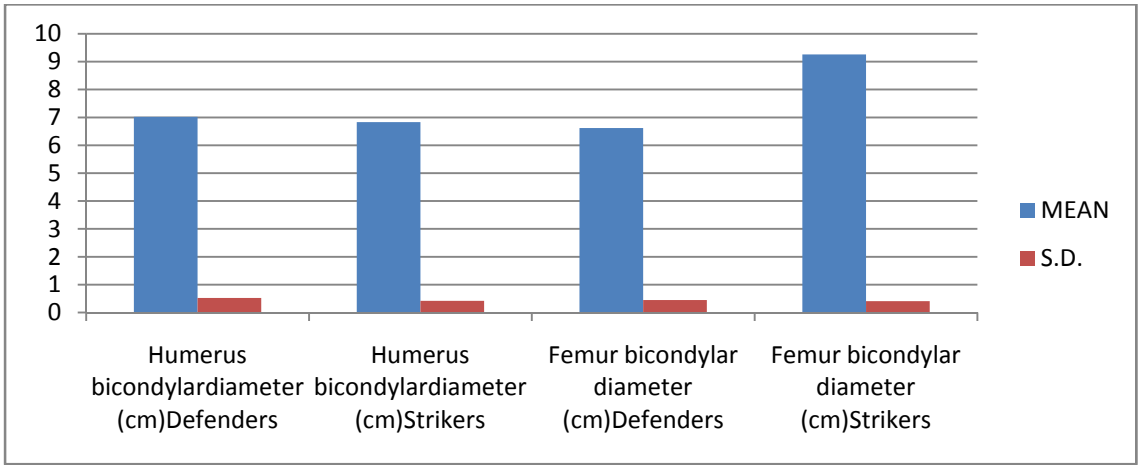
COMPONENTS	GROUP	MEAN	S.D.	t- value
Humerus bicondylardiameter (cm)	Defenders	7.02	0.52	0.95
	Strikers	6.83	0.42	
Femur bicondylar diameter (cm)	Defenders	6.62	0.45	0.91
	Strikers	9.26	0.41	

t-value 2.02 **level of significance 0.5**

d.f.=32

Table no.9 shows the Mean, S.D. and 't'- value for Humerus and Femur bicondylar diameter of Defender and Strikers. The table statistically reveals that the calculated 't'-value of Humerus bicondylar diameter 0.95 is less than table value 2.02 Hence it proves that there was insignificant difference between Defenders and Strikers in Humerus bicondylar diameter. The table statistically reveals that the calculated 't'- value of Femur bicondylar diameter 0.91 is less than table value 2.02 Hence it proves that there was insignificant difference between Defenders and Strikers in Femur bicondylar diameter. The values of table no. 9 are also illustrated in figure no.9.

Figure no. 9
Mean, S.D. and 't' values of selected Humerus and Femur bicondylar diameter variables between inter college between Defenders and Strikers in football



DISCUSSION & FINDING

The main purpose of the study was comparison of anthropometric variables of various playing positions in football. The data collected from 34 Inter College football Players. The data of all the three levels were calculated separately for all the ten anthropometric variables. The variables selected for the study are anthropometric respectively. They are Height, Weight, Humerus bicondylar and Femur bicondylar .Further the data was analyzed to find out the significant differences among the groups. 't' test statistical technique was used to analyze the significant differences and the level of significance was set at 0.05 level for testing the hypothesis.

The results revealed that there was insignificant difference among the groups in Weight, Humerus bicondylar and Femur bicondylar. However there was significant difference between defender and midfielder in Height.

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