Comparative Analysis of Selected Anthropometric Measurements between Football and Hockey Inter Collegiate Players of Himachal Pradesh University

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ABSTRACT

The purpose of the study was to analyze the differences in selected diameter between forward Football and Hockey players. This study was conducting on 60 male Football and Hockey players with an aim to find out differences in selected anthropometric measurements between the forwards Football (n=30) and forward Hockey (n=30). The data for the present study were collected in the inter college competition organized by Himachal Pradesh University, during the session 2011-2012. Each player was tested for various anthropometric measurements necessary for estimation diameters of forward Footballers and Hockey players. To analyze the difference in certain diameter measurements between two groups of Football and Hockey players were determined through 't' test.

From the findings, it may be interpreted that forwards of Hockey game possessed significantly greater wrist diameter than their counter part Football players possessed significantly greater ankle diameter than Hockey players. In case of other variables i.e. humerus bicondylar diameter and femur bicondylar diameter there exist no significant differences between the forwards of Football and Hockey games.

KEYWORDS

Anthropometry, Diameter

INTRODUCTION

Anthropometry is the systematic collection and correlation of measurements of the human body. Anthropometry has been used to assess gross structure and function, including body size, shape, and proportion and body composition. Assessment of the human body is important to determine its relationship with risk of health problems such as overweight, growth failure, and eating disorders. Anthropometry is an important technique in the field of public health and nutrition. It is important to note that research in India, in this particular field, started during the past few years. In other countries, however, research in the disciplines concerning sports has been on since long (Hirata, 1979).

Anthropometry is used to assess and

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predict performance, health and survival of individuals and reflect the sports, and social wellbeing of populations. It is a widely used, inexpensive and non-invasive measure of the general nutritional status of an individual or a population group. Recent studies have demonstrated the applications of anthropometry to include the prediction of who will benefit from interventions, identifying social and economic inequity and evaluating responses to interventions. For more information on the application of anthropometric data, Anthropometry can be used for various purposes, depending on the anthropometric indicators selected. For example, weight-for-height (wasting) is useful for screening children at risk and for measuring short-term changes in nutritional status. However, weight-for-height is not appropriate for evaluating changes in a population over longer time periods. A clear understanding of the different uses and interpretations of each anthropometric indicator is help to determine the most appropriate indicator for evaluation.

In recent years, the selection and development of talent in sports have been gaining emphasis. Of course, it involves integral approach of different sports science specialists. However, the role of anthropometry as a sports science is perhaps one of the most crucial in this regard. This is essential because the physique, body composition, physical growth and one's motor development are of fundamental importance in developing the criteria of talent selection and development in sports (Sodhi, 1991).

The sports structure in India is fast changing because of the availability of increased facilities and sports environment. Awareness among the coaches and physical educationists towards the recent advances in sports sciences is growing rapidly. The role of an emerging scientific discipline known as sports anthropometry is of great significance. It is the science that deals with the body measurements of a sportsperson. The knowledge of this science is increasingly being appreciated by the sports administrators. Assessment of human physical performance through anthropometry helps to evaluate the physical structure and functions of individuals. The knowledge of this science equips us with the techniques of various body measurements like height, body weight, diameters, circumferences and skinfolds thickness which ultimately deal with the assessment of human physique, body composition, physical growth, maturation and gross functions of the human body. The inter-relationship between each of these above mentioned variables with the success in sports can be regarded as a proven fact today (Cureton, 1951; Sargent, 1887; Tanner, 1964).

In the recent years the selection and development of talent in sports has been gaining greater emphasis. It involves

integral approach of different sports science specialties attention has been paid to the sports in childhood and adolescences, since it has been realized that top performance in many sports is reached only if appropriate training is started at very early age. Every game requires a particular type of body; unspecific body type will pose hindrance in the improvement or in achievements of sportsperson's performance. Various researches suggest that suitable physique plays a predominant role for success in sports (Cureton, 1951; Hirata, 1966 & de Garay et al, 1974).

The investigator in the underline study would like to compare the anthropometric variables i.e. diameters between forwards Football and Hockey players.

METHODOLOGY

To achieve the purpose of this study 60 Football and Hockey players i.e. forwards Football (n=30), forwards Hockey (n=30), who participated in the inter college completion organized by Himachal Pradesh University, were randomly selected and used as subjects in this study. Age group ranged from 18-25 years. Each player was tested for various anthropometric measurements necessary for estimation of selected diameter measurements. All the measurements were taken by sliding caliper. To test the significance of mean difference between the Football and Hockey players, statistical technique of 't' test was applied.

Description of measurements technique used

(i) Humerus bicondylar diameter

Equipment: Sliding caliper

The width between the medial and lateral epicondyles of the humerus was measured with the upper arm horizontal; and forming a right angle with the forearm. The caliper was applied at an angle approximately bisecting the angle of the elbow. Slight pressure was placed on the crossbars in order to compress the subcutaneous tissue.

(ii) Wrist diameter

Equipment: Sliding caliper

It measures the width between the most medial and lateral points of the distal epiphyses of radius and ulna. The subject while sitting extends hand toward the examiner with palm facing downwards. The measurement is taken to the nearest 0.5 cm while keeping the caliper at right angle from the axis of the forearm, with pressure on the crossbars of sliding caliper.

(iii) Femur bicondylar diameter

Equipment: Sliding caliper

It is the straight distance between the most medial and most lateral points of the lower end of femur. The subject was seated on the chair with the knee bent at right angle, the greatest distance between the lateral and medial epicondyles of the femur was measured with the slight pressure of the nob of sliding caliper on the crossbars placing at angle 45 degree approximately and measurement is recorded to the nearest 0.5 cm.

(iv) Ankle diameter

Equipment: Sliding caliper

It measures the diameter between the most medial and lateral projecting points of the medial and lateral malleoli. The subject is seated with foot gently touching the ground. The crossbars of the sliding caliper are applied bisecting the angle of the foot and lower leg, with firm pressure to compress the subcutaneous tissue, measuring to nearest 0.5 cm.

RESULTS & DISCUSSION

Since the purpose of the study was to analyze the selected diameters of forward players of Football and Hockey, these are explained with the help of different Tables.

Table-1: Comparison of Humerus Bicondylar Diameters and Wrist Diameter Between Forward Players of Football And Hockey

Variables	Footballers (N=30)			Hockey players (N=30)			
	Mean	S.D	S.E.M	Mean	S.D	S.EM	
Humerus Bicondylar Diameter (cm)	6.81	.24	.04	6.86	.20	.03	.82
Wrist Diameter (cm)	5.54	.37	.07	5.79	.22	.04	3.12**

*significant at 0.05 level **significant at 0.01 level

Table-1 depicts the means, standard deviations and values of SEM for humerus bicondylar diameter and wrist diameter of forward players of Football and Hockey games. The mean value of wrist diameter for forwards of Hockey game was found to be 5.79 and for forwards of Football game, it was computed to be 5.54, respectively. The t-value testing the significance of mean difference between the forwards of two games came out to be 3.12 which is significant at 0.01 level of significance, for df 58. Hence, it may be interpreted that forwards of Hockey game possessed significantly greater wrist diameter as compared to forwards of Football game. Further, forwards of Hockey game have shown little bit higher mean value for humerus bicondylar diameter as compared to forwards of Football game. But, none of such mean differences were found to be significant. So, it may be interpreted that in case of humerus bicondylar diameter there existed no significant differences between the forwards of Football and Hockey games. **Hence, the Hypothesis that,** *"there would be no significant difference between forward players of Football and Hockey in the variables of humerus bicondylar diameter and wrist diameter"* **is accepted** only in case of humerus bicondylar and stands rejected in case of wrist diameter.

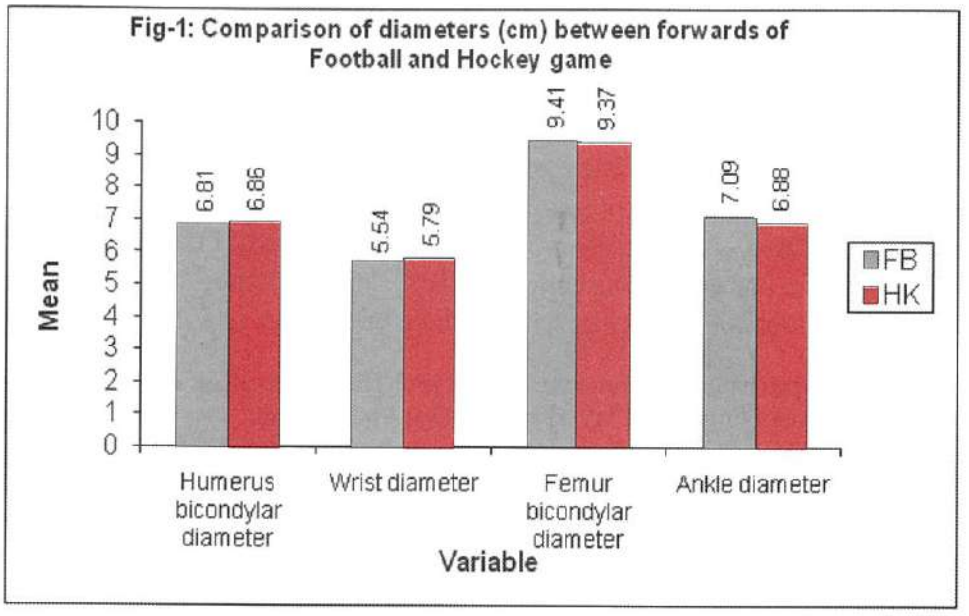

Table-2: Comparison of Femur Bicondylar Diameters and Ankle Diameter Between Forward Players of Football and Hockey

Variables	Footballers (N=30)			Hockey players (N=30)			
	Mean	S.D	S.E.M	Mean	S.D	S.EM	
Femur Bicondylar Diameter (cm)	9.41	.23	.04	9.37	.55	.09	.42
Ankle Diameter (cm)	7.09	.26	.04	6.88	.18	.03	3.57**

*significant at 0.05 level **significant at 0.01 level

Table-2 depicts the means, standard deviations and values of SEM for femur bicondylar diameter and ankle diameter of forward players of Football and Hockey games. The mean value of ankle diameter for forwards of Hockey game was found to be 6.88 and for forwards of Football game, it was computed to be 7.09, respectively. The t-value testing the significance of mean difference between the forwards of two games came out to be 3.57 which is significant at 0.01 level of significance, for df 58. Hence, it may be interpreted that forwards of Football game

possessed significantly greater ankle diameter as compared to forwards of Football game. Further, although the forwards of Football game have depicted somewhat higher mean value for femur bicondylar diameter also in comparison to forwards of Hockey game. So, it may be interpreted that in case of femur bicondylar diameter, there existed no significant differences between the forwards of Football and Hockey games. Hence, the Hypothesis that, "there would be no significant difference between forward players of Football and Hockey in the variables of femur bicondylar diameter and ankle diameter" is accepted only in case of femur bicondylar diameter and stands rejected in case of ankle diameter.

It has been found that there were significant differences between the forward players of Football and Hockey game in wrist diameter and ankle diameter. The strong and flexible wrist among the Hockey players is a natural corollary of regular and continuous usage of the Hockey stick. This fact has also been corroborated in the present study that Hockey players have more wrist diameter than Football players. In Football, ankle plays a major role as it helps kicking the ball and pivoting the body weight of the players on the ground. In both the games, ankle plays a major role but if compared with Football, the players have more diameter than Hockey players as there is no use of the stick and the whole game relies only on the feet.

However, there was no significant difference in humerus bicondylar diameter and femur bicondylar diameter. This indicates that forwards of Hockey game have greater diameter of wrist and lesser diameter of ankle but possess near about same diameter of elbow and knee than forwards of Football game.

CONCLUSION

1. There were significant differences between Football and Hockey players in wrist diameter and ankle diameter. Forwards of Hockey game possess significantly wider diameter of wrist and lesser ankle diameter than the forwards of Football game.
2. Forwards of Football and Hockey players do not differ significantly in humerus bicondylar diameter and femur bicondylar diameter when compared with each other.

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