

**A COMPARATIVE ANALYSIS OF SOMATOTYPE
CHARACTERISTICS OF STATE LEVEL HOCKEY PLAYERS**

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ABSTRACT

The first application of anthropometry in physical education began with Dr. Edward Hitchcock in 1861, when he undertook a study of anthropometrical measurements of Amherst College Men, leading to the publication of anthropometrical tables almost annually for 40 years. "A COMPARATIVE ANYALYSIS OF SOMATOTYPE CHARACTERISTICS OF STATE HOCKEY PLAYERS". The study was delimited to the analysis of somatotype components by using Health-Carter Anthropometric Somatotype Method. The Health Carter Anthropometric Somatotype method was selected to find out the somatotype characteristics of the male Hockey Players. Compare the somatotype characteristics of offensive and defensive Hockey players, mean, standard deviation and 't'- test were calculated for endomorphy, mesomorphy and ectomorphy. There was no significant difference between offensive and defensive hockey players in relation to endomorphy component. There was no significant difference between offensive and defensive hockey players in relation to mesomorphy component. There was no significant difference between offensive and defensive hockey players in relation to ectomorphy component.

INTRODUCTION

In physical education, as one might surmise. Study of the human physique & its proportions began many centuries ago. The early beginnings can be traced to the remote civilization of India, where a treatise called "Silpi Sastri" analyzed the outline of the body by dividing it into 480 parts. Anthropometry evolved in the quest to determine the ideal body proportions, and artists and sculptors directed their study to it as shown by the artwork of early civilization. Artists comprised the chief workers in anthropometry unit 1835 when a mathematician in Brussels, Baron Quenelle, applied purely mathematical methods to discover the physical constants of the

human body and proved that the binomial law (law of chance) applies to human proportions. This finding was confirmed about 50 years later by Sir Francis Galton, who systematically analyzed measurement of certain physical constants of English men and women. In 1854, a German named Carus proposed an anatomical basis to determine body proportions. Shortly after this, Zeissing in Belgium and Cromwell in England studied the growth of school children.

The first application of anthropometry in physical education began with Dr. Edward Hitchcock in 1861, when he undertook a study of anthropometrical measurements of Amherst College Men, leading to the publication of anthropometrical tables almost annually for 40 years. The aim of anthropometry was depicted by Hitchcock as ascertaining the ideal of typical man as a guide in fostering the development of normal individuals. He provided his student with a chart showing average result associated with different variables, against which the student might plot his own result. In 1886, Sergeant published an anthropometric chart based on 6 years of examining Harvard students. Sergeant included lung capacity and certain strength measurements along with various measures of physical proportion and expressed the results in percentiles. From 1885 to 1900, anthropometrical studies were conducted at different collegiate institutions involving close to 8000 men and women. In 1890, Saver published what proved to be the pioneer American book on physical measurements of the body, it was subsequently revised twice.

Hockey, which is excellent around team sport, has been widely accepted as a highly competitive as well as a recreational game throughout the world. It is now recognized as one of the most breathtaking and dramatic sport of the Olympics both from the players and spectators view point.

The game of Hockey offers opportunities for the development of strength, endurance, speed, agility, and neuro-muscular skills and immediate action along with many precise educational outcomes. The game of hockey requires a conditioning programme, which develops flexibility, muscular strength, power and agility all of which must be integrated to achieve the optimum skill performance from each player.

The purpose of this study was a Comparative Analysis of Somatotype Characteristics of Inter University Hockey Players.

Somatotype

Somatotype deals with the body type or physical classification of the human body. The term endomorphy, mesomorphy and ectomorphy are used to describe a person in terms of his somatotype.

The Endomorphy

The first component is characterized by roundness and softness of body According to Layman; endomorphy is the fatness component of the body. Anterioposterior diameters as well as lateral diameters tend towards equality in the head, neck, trunk and limbs. Features of this type are predominance of abdomen over thorax, high square shoulders and short neck.

The Mesomorphy

The second component is characterized by a square body with hard, rugged and predominant musculation. The bones are large and covered with thick muscles. Legs, trunk and arms are usually massive in bone and heavily muscles through out. Outstanding characteristics of this type are forearm thickness and heavy wrist, hand and fingers. The thorax is large and waist is relatively slender, shoulders are broad; the trunk is usually upright and the trapezius and deltoid muscles area quite massive. The abdominal muscles are predominant and thick.

The Ectomorphy

The third component is characterized by linearity, fragility, and delicacy of body. This is the leanness component. The bones are small and the muscles thin. The limbs are relatively long and the truck short, however, it does not mean that the individual is tall. The abdomen and lumbar curve are flat. While the thoracic curve is relatively sharp and elevated. The shoulders are mostly narrow and lacking in muscle relief. There is no bulging of muscle of any point on the physique. The shoulder girdle lacks muscular support and padding the scapulae tend to wing out posterior.

Hypothesis:-

It was hypothesized that somatotype characteristics of inter – university players may dominate in mesomorphy characteristics.

Objective of the Study

The objective may finally help in following ways-

- The play a significant role for sports administrators in planning and modifying various policies and programmes at State levels.
- This will also help in the selection of players having proper physical characteristics.
- This will also help in knowing the bodily characteristics of different level Hockey players.
- This will help in planning the training schedule for players as per their need and state of their body type.
- It will help in creating the model image of ideal Hockey Players.
- The also reveal the most suitable body type for Hockey game and will help to predict the rate of success in the Hockey.

Subjects

The subjects were 160 male state level hockey players, who had represented State Level hockey tournament 2011-2012 held at Lucknow, U.P. The hockey Players were divided in two groups offensive and defensive. So eighty offensive players and eighty defensive players were selected for the study.

METHDOLOGY

Collection of Data

The data was collected during the State Level hockey Hockey tournament 2011-2012 held at Lucknow, U.P.

In order to obtain three somatotype components, the following measurements were recorded-

- (i) Height
- (ii) Weight

Skin folds: Triceps, Sub scapular, Suprailiac, Calf

Bone Width: Humerus, Femur

Girths: Upper Arm, Calf

Statistical Procedure

In order to compare the somatotype characteristics of offensive and defensive Hockey players, mean standard deviation and 't'- test were calculated for endomorphy, mesomorphy and ectomorphy.

To determine the anthropometric characteristics of university level hockey players mean and standard deviation were calculated.

RESULT

TABLE - 1

COMPARISON OF ENDOMORPHY COMPONENT OF OFFENSIVE AND DEFENSIVE HOCKEY PLAYERS

| S.No. | Somatotype | Offensive | | Defensive | | t-ratio |
|-------|------------|-----------|------|-----------|------|---------|
| | | Mean | S.D. | Mean | S.D. | |
| 1 | Endomorphy | 3.2 | 0.69 | 3.4 | 0.66 | 0.826 |

Table 1 reveals that there was no significant difference between offensive and defensive hockey players in relation to Endomorphy component. Because the calculated value of t-0.05 (148) 0.826 is lower than the tabulated value of 0.05 (148) 1.96.

TABLE - 2

COMPARISON OF MESOMORPHY COMPONENT OF OFFENSIVE AND DEFENSIVE HOCKEY PLAYERS

| S.No. | Somatotype | Offensive | | Defensive | | t-ratio |
|-------|------------|-----------|------|-----------|------|---------|
| | | Mean | S.D. | Mean | S.D. | |
| 2 | Mesomorphy | 3.1 | 0.67 | 3.2 | 0.68 | 0.726 |

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|--|--|--|--|--|--|--|
| | | | | | | |
|--|--|--|--|--|--|--|

Table 2 shows that there was no significant difference between offensive and defensive hockey players in relation to mesomorphy component. Because the calculated value of $t=0.05(148)$ 0.726 is lower than the tabulated value of $t=0.05(148)$ 1.96.

TABLE - 3

COMPARISON OF ECTOMORPHY COMPONENT OF OFFENSIVE AND DEFENSIVE HOCKEY PLAYERS

| S.No. | Somatotype | Offensive | | Defensive | | t-ratio |
|-------|------------|-----------|------|-----------|------|---------|
| | | Mean | S.D. | Mean | S.D. | |
| 3 | Ectomorphy | 2.9 | 0.55 | 3.1 | 0.60 | 0.764 |

Table 3 reveals that there was no significant difference between offensive and defensive hockey players in relation to ectomorphy component. Because the calculated value of $t=0.05(148)$ 0.764 is lower than the tabulated value of $t=0.05(148)$ 1.96.

Conclusions

The following conclusions are made:

- (1) There was no significant difference between offensive and defensive hockey players in relation to endomorphy component.
- (2) There was no significant difference between offensive and defensive hockey players in relation to mesomorphy component.
- (3) There was no significant difference between offensive and defensive hockey players in relation to ectomorphy component.

Recommendation's

The following recommendations are made:

1. A study can also be conducted on players of higher level.
2. A similar study may also be conducted on female hockey players.
3. A study can also be conducted by taking a large sample.
4. A similar study may also be conducted on young athletes for predicting their hockey playing ability.
5. A study can also be conducted on players of different countries participating in international competitions.
6. This type of study may also be conducted on up coming players of hockey by taking some other characteristics that may be helpful for the hockey players.

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