

A COMPARISON OF SELECTED PHYSIOLOGICAL VARIABLES OF FOOTBALL PLAYERS AT DIFFERENT PLAYING POSITIONS

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ABSTRACT

The purpose of this study was to compare the selected physiological variables between players of different playing positions in Soccer. The subjects for the study were twenty defenders and twenty forward Football players were randomly selected from different clubs of Noida, U.P. Following physiological variables were selected for the study: aerobic capacity and anaerobic capacity. To measure the aerobic capacity Cooper's 12 m run/ walk test was used and to measure the anaerobic capacity 50 m dash was used. To compare the selected physiological variables between players of different playing positions in Soccer "t" test was applied at 0.05 level of significance. The result reveals that there were no significance difference between the aerobic capacity and anaerobic capacity of defender and forward players in soccer..

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INTRODUCTION

Physiology is one of the biomedical sciences which deal with the functions of living organism. The goal of physiology is to gain insight into the machinery of the human organism, the roles and interactions of its parts and the resultant output of these interactions i.e. the overall functioning of the organism. The field of exercise physiology however has generally taken a more biological view of fitness particularly in regard to how someone responds to the demands of exercise. Essentially, this approach has required the tests to focus on how well the human circulatory and respiratory systems handle the stress prescribed exercises. Soccer is an anaerobic dominating sport with intermittent sprint with control. Anaerobic endurance along with good aerobic endurance is the basic requirement of the game of soccer.

Physical capacity of athletes is an important element of success in sports achievements. It involves a huge number of different capacities, with aerobic capacity being its major component. Physiological basis of physical capacity of an organism incorporates the functional capacity of the organism to increase the level of metabolic processes in keeping with the requirement of physical effort being exposed to. We metabolic processes in this sense mean the transformation of chemical energy into mechanical one (Bower & Fox, 1988).

Aerobic capacity denotes a general extent of metabolic processes occurring in the human organism, and stands for a larger portion of the total energetic capacity. Maximal oxygen uptake refers to the intensity of aerobic processes, and actually represents the capacity of the organism to utilize at a certain moment the maximum amount of oxygen (Wilmore & Costill, 1999).

However, as these two processes are highly interrelated, maximal oxygen uptake has been regarded by majority of authors as the best indicator of aerobic capacity of the organism, i.e. the functional capacities of cardiovascular and respiratory systems, as well as the capacity of tissues to utilize oxygen; at the same time, it is the best indicator of the athlete's physical capacity. Maximal oxygen uptake is defined as maximum amount of oxygen which the organism consumes per unit of time while performing the exercise of growing intensity, and which cannot be further increased with further rise of exercise intensity. Maximal oxygen uptake as a measure of aerobic capacity has been determined as the international standard of physical capacity (Fleg, Piila & Balady, 2002 ; Fletcher, Balady, & Frolicher, 1995) Continuing estimation of athletes' physical capacity is one of the most important tasks of the physiology of sport. In that way, one can get insight into the momentary physical capability of athletes and efficiency of the training process. Determination of aerobic capacity is possible to perform with great precision by direct measuring of maximal oxygen uptake in laboratory tests on maximal physical effort. More or less accurately, it can be indirectly estimated by means of various sub-maximal laboratory and field tests.

Past research indicates that muscular strength and anaerobic power may be important for increased running performance through neurological and muscular changes (Abernethy, 1994; Sale, 1988). These positive muscular adaptations may include increased anaerobic enzyme activity, increased force production, increased intramuscular glycogen, or shifts within major fibre type groups. Neural adaptations may include improved motor unit

recruitment and synchronization, improved force development rate, and improvements in the stretch-shortening cycle. But, little is known about the influence of strength training on aerobic and anaerobic power.

Proietti (2002) reported a significant correlation between the aerobic power (Synthesis test 1999) and the high speed running (> 21.6 km/h) during a soccer game (table 24,25,26). Further correlation was found also with the anaerobic sprint power (Rast test 1996).

The aim of the investigation was to provide valuable insight into aerobic capacity i.e. athlete's capability as an indicator of his physical capacity, difference in aerobic capacities of athletes with regard to the kind of sport they were practicing, as well as the differences obtained when compared with physically inactive subjects – the so called non-athletes.

METHODOLOGY

Selection of Subjects:

The subjects for the study were twenty defenders and twenty forward Football players were randomly selected from different clubs of Noida, U.P.

Instrumentation :

Following physiological variables were selected for the study: aerobic capacity and anaerobic capacity. To measure the aerobic capacity Cooper's 12 m Run/ Walk test was used and to measure the anaerobic capacity 50 m dash was used.

RESULTS AND DISCUSSION

To compare the selected physiological variables between players of different playing positions in Soccer "t" test was applied at 0.05 level of significance.

TABLE 1
SIGNIFICANCE OF DIFFERENCE BETWEEN DEFENDER AND FORWARD
FOOTBALL PLAYERS IN THEIR AEROBIC CAPACITY

Variable	Defender		Forward		t-ratio
	M	SD	M	SD	
Aerobic Capacity	3564.50	267.50	3618.00	190.00	0.317

Significant at 0.05 level, $t_{0.05} (38) = 1.68$

Table 1 reveals that there were no significance between the aerobic capacity of defender and forward players in football because the calculated value of $t_{0.05} (38) = 0.317$ was lower than the value of $t_{0.05} (38) = 1.68$.

TABLE 2
SIGNIFICANCE OF DIFFERENCE BETWEEN DEFENDER AND FORWARD
FOOTBALL PLAYERS IN THEIR ANAEROBIC CAPACITY

Variable	Defender		Forward		t-ratio
	M	SD	M	SD	
Anaerobic Capacity	6.45	0.31	6.18	0.12	0.644

Significant at 0.05 level, $t_{0.05} (38) = 1.68$

Table 2 reveals that there were no significance between the anaerobic capacity of defender and forward players in football because the calculated value of $t_{0.05} (38) = 0.644$ was lower than the tabulated value of $t_{0.05} (38) = 1.68$.

CONCLUSION

There was no significant difference between defender and forward football players in relation to aerobic capacity and anaerobic capacity.

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