

Comparing Aerobic Capacity of Defenders & Strikers in Football

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Abstract:-

The study was undertaken to compare the aerobic capacity (vo2 max) defenders & strikers in football from Mumbai city. For this study 40 students aged between 13-17 years (20 defenders & 20 strikers) were selected from Steadfast Football Academy by using convenience sample technique. Coopers 12 min run and walk test was administered on the Football Players and Heywood's VO₂ Max Equation was used to calculate the VO₂ max. Chi-square was used to draw the conclusion. Results show that there was a significant difference between aerobic capacity of defenders & strikers in football. The conclusion was that strikers had better aerobic capacity than defenders in football. The study was taken basically to make everybody realize that their can be difference in aerobic capacity of players playing at different positions in football and to further to make them aware of the importance of Aerobic capacity for a footballer irrespective of their positions.

Key Words: VO₂ Max, Aerobic capacity, Heywood' VO₂ Max equation, Strikers, Defenders

Data source has been collected from various publications and websites

Introduction

What is VO₂ max?

VO₂ max or maximal oxygen uptake, is one factor that can determine a players capacity to perform sustain exercise and is linked to aerobic endurance. VO₂ max refers to maximum amount of oxygen that an individual can utilize during intense or maximal exercise. It is measured as "milliliters of oxygen used in one minute per kilogram of body weight."

This measurement is generally considered the best indicator of a player's cardiovascular fitness and aerobic endurance.

Football, Competitive football and Physical fitness are closely associated and contribute to each other. Experts have recommended that the combinations of physical fitness program with a healthy life style and a wellness approach to good health and quality of life (Uppal 2011).

Playing football helps to improve once physical fitness while physical fitness program helps to improve the quality of football play. When it comes to competitive football one must have a scientific approach towards development of the Physical fitness, skills, strategies & execution of the same on the field, further this execution should be continuous in various matches & in various tournaments in shot the performance should be consistent.

For this consistent performance the players should be well aware of the physical fitness demands of the game as well as their own abilities so that the concern physical fitness aspects where they have to work can be developed with proper work outs program .This comparison will certainly give a vision to all the players in he team that the aerobic capacity is not only important to the strikers in football but it also needful to the defenders in t the team

VO₂ max and Football

Soccer players posses excellent endurance with VO₂max reported to range between 55 and 70 ml/kg/min in elite performers (Bangsbo et al, Reilly et al).

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VO₂ Max varies according to playing position. For outfield players, midfielders have significantly greater aerobic power values whilst central defenders have the lowest values.

The game is played at an average intensity close to the lactate threshold - approximately 80-90% of maximum heart rate (Helgerud et al, Reilly et al).

The greater a player's aerobic capacity (VO₂max), the more ground they cover during a typical game and the number of sprints completed in a game also increases (Reilly et al, Smaros et al).

By improving the VO₂max of youth soccer players by 11% over an 8 week period, a 20% increase in total distance covered during competitive match play was manifested, along with a 23% increase in involvements with the ball and a 100% increase in the number of sprints performed by each player (Reilly et al)

Method:

Sample: Steadfast Football Academy was selected for the data collection as the academy has satisfactory numbers of playing for their different teams and specialized training is imparted in the academy for the players according to their position of play in the Team. Total 40 players aged between 13-17years (20 defenders & 20 strikers) from Mumbai city were selected by using convenient sample technique.

Measuring tool: Coopers 12min run and walk test was used as a measuring tool and Heywood vo₂ max equation were used for the interpretation.

Procedure:

Permission was taken from Steadfast Football Academy selection of sample was done i.e. 40 (20 defenders & 20 strikers) were selected from Steadfast Football Academy. At the time of data collection all the necessary instruction were given to the footballers about the objective of the study and test procedure. According the procedure, appropriate warming up exercise were to be given to the subjects before starting the test and then coopers 12min run and walk test was administered. Each score which was obtained from the test by the subjects were compared with the Heywood vo₂ max equation i.e. [ml.kg.min]=[0.0268*total distance]-11.3).

Calculating VO₂ max

An estimate of your VO₂max can be calculated as follows:

$$(\text{Distance covered in metres} - 504.9) \div 44.73 = \text{VO}_2\text{max}$$

Table No 1
Heywood VO₂ max equation

Age	Very poor	Poor	Fair	Good	Excellent	Superior
13 - 19	<25.0	25.0-30.9	31.0-34.9	35.0-38.9	39.0-41.9	>41.9

There are six ranges for age group (13 – 17). The score range from <25.0 very poor, 25.0-30.9, 31.0-34.9 poor, 31.0-34.9 fair, 35.0-38.9 good, 39.0-41.9 excellent, >41.9 superior respectively. After getting the final scores, further analysis was done by using chi-square from S.P.S.S (version 17.0)

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Results:-

Table No 2
Descriptive analysis of vo2 max scores of Strikers and Defenders

Category	Very Poor	Poor	Fair	Good	Excellent	Superior	Total
Strikers	1	4	3	2	10	0	20
Defenders	4	7	5	4	0	0	20
Total	5	11	8	6	10	0	40

Table 2 shows the difference between vo2max level in category wise as fair, good and excellent for Strikers & Defenders in a Football Team. The score for Defenders is obtained as 5,4,0 respectively and similarly Strikers 3,2,10 respectively. The score of both the categories is added and obtained score is 9 as Defenders and 15 as Strikers medium respectively.

Table no 3
Chi-Square statistics of Vo₂ max between two medium school girls

	Value	df	Asump. sig. [2-side]
Pearson Chi-Square	12.551	4	0.014
Likelihood Ratio	16.445	4	0.002
No of Valid Cases	40		

Table no3:- .represents chi-square value of striker and defenders. The table shows that there was significant difference of vo2 max between the Striker and Defenders (sig=0.014).

Conclusion:-

We can easily conclude that the footballers do possess different Vo₂ Max capacity according to the position which they are playing, clearly establishing that all the footballers don't have same or almost the same Vo₂ capacity though the game is same. Analyzing the level of physical activity during a game the defenders do defend actively most of the time in a game but the Strikers were more occupied in the field compared to defenders. Based on the findings of the present research it is concluded that there is significant difference in vo2 max capacity between Strikers and Defenders. The results revealed that Strikers had better aerobic capacity than Defenders.

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