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VO₂ max of North East Indian football players

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Abstract

Football players sprint several times to attack, seize the ball or rush to secure the area for the whole duration of the game, which required aerobic capacity and is a factor in winning a game. Therefore, the purpose of the study was to describe the aerobic capacity of grassroots boy's football players in North-east India. The study was conducted on one hundred and twenty-five boys of age: 11±1; height: 142.56±9.29 cm and weight: 35.53±7.13 kg from the northeast state of India. Aerobic capacity was measured by a 20m shuttle run test. Descriptive statistic was applied for analysis in SPSS 16. In the result, the median VO₂ max was 44.49 and the median class was 42-46. 36% were lies in the median class, 13.6% were below the median and 49.8% were above the median. The study concluded as the North-east player has good aerobic capacity at the national level but at the international level, aerobic capacity was average. Therefore, it was suggested that for competing at an international level further research and proper training were required.

Keywords: VO₂ max, football players, aerobic

Introduction

Football players sprint several times to attack, seize the ball or rush to secure the area, thus aerobic energy systems are 70% of the time and anaerobic energy systems are 30% of the time (Shepherd, 2007) [8]. Apart from technique, maintaining intensity according to the opponent's speed in an entire football match is one of the major factors in winning or losing the game, therefore higher anaerobic threshold and ability to maintain intensity close to the anaerobic threshold can change the game, intensity above the anaerobic threshold is not possible due to the long duration of a football match (Wisloff *et al.*, 1998) [10]. Generally, in the second half of the match, game speed reduces and is dominated by the team having high aerobic capacity. The mean game intensity of football players was approximately 84% HRmax (Del Coso *et al.*, n.d.). VO₂ max of an elite football was more than 60 ml. min. kg⁻¹ (Ziogas *et al.*, 2011) [11]. In another study maximum, oxygen uptake of a football player was 50 to 60 ml/kg/min (Tumilty, 1993) [9]. In the world contest development from the grassroots level is one of the key points of success. Football Grass root development was initiated in 2015 in India. However scientific study on grass roots is scarce for Indian contest, therefore this study is conducted on grassroots boys football players of northeast India focussing on VO₂ max. The maximal oxygen volume that may be used per minute is defined as VO₂ max. Guyton and Hall (in Giri Wiarto, 2013) define VO₂ max as the rate of oxygen consumption during maximal aerobic metabolism. According to Théoden in the Suranto module (2008: 118), VO₂ max is the maximal aerobic capture power, which reflects the greatest quantity of oxygen absorbed per unit of time by a person during exercise or testing, with increasing severity of activity until weariness.

Method

Participant

For the study, grassroots football players from different football clubs of Manipur and Mizoram were selected. A total of One hundred twenty-five boys grassroots football players participated in the study. The mean age, height and weight were 11±1; 142.56±9.29 cm and 35.53±7.13 kg respectively.

Procedure and statistic

The VO₂ max was measured by a field test method, the “20 m shutter run test”. The players run to-and-fro between 20 m apart lines on time at the desired speed. Timing and speed were set in a beep sound record at a speed of 8.5 km/ hour and gradually increase by 0.5 every minute. If a player fails to reach on time a chance was given, at the second fail test was stopped. And recorded the level and number of shuttle reaches before the test was stopped. Maximum oxygen uptake was calculated from the prediction equation of Leger *et al.* (1988), $VO_2 \text{ peak} = \{31.025 + 3.238 (\text{Speed}) - 3.248 (\text{Age}) + 0.1536 (\text{Age}) (\text{Speed})\}$, Where, $\text{Speed} = 8 + 0.05 \times \text{level completed}$. For describing the VO₂ max of a grassroots football player, descriptive statistics of group data were applied using SPSS 16 at a significant level of 0.05.

Result and Discussion

Table 1: VO₂ max Descriptions of Grassroot players

Class interval	Frequency	Percent	Median	Stander Deviation
37.00-41	17	13.6		
42.00-46	45	36.0	44.49	4.86
47.00-51	35	28.0		
52.00-56	27	21.6		
57.00-61	1	.8		
Total	125	100.0		

In the above table VO₂ max of 125 is described. The Median VO₂ max is 44.49 and the median class is 42-46. 36% are lies in the median class, 13.6% are below the median and 49.8% are above the median. Based on this study 86.4% are on or above the median which means very good. According to Laurence E. Morehouse as cited in Padmapriya & Sujaya (2013) [7] cardiovascular endurance level was classified as very low, low fair, average, good and very good. In the study of Padmapriya & Sujaya (2013) [7] 66% of boys were lies under lowfair (34-39 ml/kg/min) and 34% achieved average to good (44-49 ml/kg/min), Based on this classification 64% achieved average to good and 22.4% achieved very high. This means in the Indian contest northeast grassroots football player has good cardiovascular endurance.

Compared to the international level cardiovascular endurance of North-east players is average. In the study of Baye & Hirvonen (2020) [1], and Fellmann *et al.*, (1986, 1992) [3, 4], maximum oxygen capacity was reported as 35 to 45 ml.kg⁻¹.min⁻¹ for children living at high altitudes (3000m). The cardiovascular endurance of individuals who lived at high altitudes were 10% less than the sea level individual (Fellmann *et al.*, 1992) [4]. Manipur and Mizoram lie a low attitude according to Gore *et al.* (2008) [5].

Conclusion

Based on the above result and discussion, it can be concluded that Northeast Grassroot football has good cardiovascular endurance in Indian contests, therefore playing football might be a good choice of the Game base on endurance capacity. Compared to the international level northeast player's cardiovascular endurance is average, therefore more research needs to be done to find the factor to develop cardiovascular endurance influencing factors with proper training of the grassroots players.

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