Comparison Of Respiratory Indices Amongst Football And Hockey Players

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Abstract

The Purpose of the study was to compare the respiratory indices among football and hockey players of L.N.I.P.E, N.E.R.C, Guwahati. Thirty (N=30, 15 Hockey and 15 Football Players) male players were selected as volunteers and the age ranging from 18-23 years from there respective match practice groups. All the volunteers are from football and hockey match practice group. The following respiratory indices for the study i.e. Forced Vital Capacity (FVC), Forced Expiratory Volume in First second (FEV1) and Tidal Volume (TV). All three Respiratory indices data collection by the Computerized **Minispro Spirometery**Machine which was installed at Exercise Physiology Laboratory of L.N.I.P.E, Guwahati. On the basis of the Result and statistical calculation it was concluded that football players having better Forced Vital Capacity (FVC) and Forced Expiratory Volume in First Second (FEV1) than the hockey players. On the other hand Tidal Volume found insignificant as there wer no difference between found in hockey and football players. Thus, it was concluded that significant difference in forced vital capacity (FVC) and Forced Expiratory Volume in First Second (FEV1) and shows that the null hypothesis has been rejected in these respiratory indices.

Keywords: -Minispro Spirometery, “t” Test, FVC, FEV1 & TV.

Introduction: -

Physical fitness involves the performance of the heart and lungs, and the muscles of the body. And, since what we do with our bodies also affects what we can do with our minds, fitness influence to some degree qualities such as mental alertness, social and emotional stability. Exercises give very positive impact on each system of the body especially on cardiovascular system, muscular system, skeletal system, nervous system and so on. In cardiovascular system improvement so many changes occur as: - hypertrophy (change in size of myocardium), Increase in stroke volume, increase in numbers of mitochondria due to aerobic training. Same as cardiovascular system so many changes occur in the respiratory system due to exercises as: - increase in the inspiratory capacity, increase lungs capacity which directly affect the volume of air inspired and expired. Likewise, so many changes occur in different systems of the body. Breathing that every cell in the body receives its supply of oxygen and at the same time gets rid of the carbon dioxide and other waste products. Oxygen combining with the carbon and hydrogen of the tissues enables the metabolic processes of each individual cell to proceed, with the result that work is affected and waste products in the form of carbon dioxide (CO2) and water (H2O) are eliminated. Respiration is a two-fold process consists of “internal respiration” and “external respiration”. Exercises and healthy daily routine can improve the whole respiratory system efficiency. Training and conditioning inclides those practices which are best to prepare the players for efficient performance through a carefullly planned programme of progressive practice which will optimize the performance factors as vital capacity, arteriovenous oxygen difference(a-vO2)difference etc. Football is a game of strength endurance. Football

players require stamina, strength, cardio-vascular endurance, agility, flexibility and so on. For a football player there are so many skills which are required to play effectively and smoothly. Some of them are dribbling, receiving, passing, kicking, throwing, heading and so on. The success or lack of it depends on every player's physical capability and advancement or mastery over the skills and also on player's physical capabilities.

Resembling to football, hockey is also a speed endurance game which require approximately similar fitness related components and their improvements. But in hockey back strength should be good for being an elite athlete. In skill related component speed, flexibility, balance and coordination need to be developed. Game related skills like rolling, flicking, passing, receiving, scooping, tackling and dodging the opponents should be developed. Hockey is a dynamic team game played by both sexes requiring high level of skills, excellent conditioning and well-co-ordinated team effort. Modern Hockey demands that all the players should be adopted to all the situations either defending or attacking. Hockey is a game which calls for strenuous, continuous, thrilling action and therefore attracts the youth all over the World.

Aim of the Study:

The Aim of the study was to compare the selected respiratory indices among football and hockey players.

Material and Methods:

Random group design was adopted for the purpose of the study. The volunteer was divided into two groups (Football -15 & Hockey -15).

Volunteers of the Study:

For the Purpose of the study total 30 Volunteers were selected from two match practice group i.e. football(**N=15**) and Hockey (**N=15**) from L.N.I.P. E, N.E.RC. Guwahati and the age range from 19-23 years old male Volunteers. To examine the Respiratory indices the following respiratory variable were selected like **Forced Vital Capacity, Tidal Volume** and **FEV1** for the Study**.** For the collection of the data Computerized Minispro Spirometer were used to measure the selected respiratory indices.

Delimitation of the study:

- Study was delimited to the hockey and football players of LNIPE, Guwahati.
- Study was delimited to the following selected variable i.e.-**FEV1, Forced Vital Capacity & Tidal Volume**

Limitation of the Study:

- Psychological and physiological factors that affect metabolic function were consideration as limitation of the study.
- Diet, lifestyle, daily routine, habits, etc are considered as limitations of this study.
- Atmospheric temperature, humidity and meteorological factors also consider as limitation of the study.

Result:

The data was examined by applying descriptive statistics and Unpaired Sample t-test employed to find out the statistical difference between football and

hockey player in selected respiratory indices. To test the hypothesis the level of significance was set at 0.05. The result of the study as follows.

Table -1- Descriptive analysis of mean and standard deviation of selected respiratory indices of Hockey and Football players.

Variable	Group	N	Mean	Standard Deviation
Force Vital Capacity	**Hockey**	15	3.5	.66
	Football	15	4.0	.51
FEV1	**Hockey**	15	3.3	.51
	Football	15	3.8	.39
Tidal Volume	**Hockey**	15	2.9	.58
	Football	15	3.2	.64

Table-2- Unpaired sample T test of Hockey and Football players for forced vital capacity.

	Levene's test for equality of variances	**T-test for equality of means**			
	F	**Sig**	**T**	**df**	**Sig (2-tailed)**
Equal variance assumed	.683	.415	2.206	28	.036
Equal variance not assumed			2.206	26.362	.036

***Significant at 0.05 (2,28) = 2.084**

Table 3: Significance of mean difference between Hockey and Football players in Forced VitalCapacity (FVC)

Group	Mean	S.D.	t-value	P-value	F-value
Hockey	3.52	.663			
			2.206	.415	.683
Football	4.00	.51			

It is evident from the above **Table 2** and **3** mean and standard deviation of the score of hockey and football players in forced vital capacity (FVC) were 3.52 ± (.66) and 4.0 ± (.51) respectively. A mean difference of 0.47 between both groups yielded a significant 't' ratio of **2.206** which was found to be significant at 0.05 level of confidence. The required 't' value was **2.048**. As result of the T test revealed that calculated value (2.206) is more than the tabulated value that is 2.048 or significant 2 tailed value (.036) is less than the 0.05 level of significance which indicated that forced vital capacity of football players is better than the hockey players.

Table 4: Unpaired sample T test of Hockey and Football players for FEV1

	Levene's test for equality of variances	**T-test for equality of means**			
	F	**Sig**	**T**	**df**	**Sig (2-tailed)**
Equal variance assumed	1.212	.280	2.513	28	.018
Equal variance not assumed			2.513	26.3	.018

***Significant at 0.05 (2,28) = 2.084**

Table-5: **Significance of mean difference between Hockey and Football players in Forced Expiratory Volume in the first second (FEV1).**

Group	**Mean**	**S.D.**	**t-value**	**P-value**	**F-value**
Hockey	3.35	.51			
			2.513	.280	1.212
Football	3.78	.39			

It is evident from the above **Table 4** and **5** mean and standard deviation of the score of hockey and football players in ForcedExpiratory Volume in First Second (FEV1) were 3.35 ± (.51) and 3.78 ± (.39) respectively. A mean difference of 0.42 between both groups yielded a significant 't' ratio of 2.513 which was found to be significant at 0.05 level of confidence. The required 't' value was 2.048. As result of the T test revealed that calculated value (2.513) is more than the tabulated value that is 2.048 or significant 2 tailed value (.036) is less than the 0.05 level of significance which indicated that football players are better than the hockey players in term of forced expiratory volume in the first second (FEV1).

Table 6: Unpaired sample T test of Hockey and Football players for Tidal volume.

	Levene's test for equality of variances	**T-test for equality of means**			
	F	**Sig**	**T**	**df**	**Sig (2-tailed)**
Equal variance assumed	.488	.491	1.247	28	.223
Equal variance not assumed			1.247	27.7	.223

***Significant at 0.05 (2,28) = 2.084**

Table 7: Significance of mean difference between Hockey and Football players in Tidal Volume (TV)

Group	Mean	S.D.	t-value	P-value	F-value
Hockey	2.97	.57			
			1.247	.491	.488
Football	3.25	.63			

It was evident from the table **6** and **7** that mean and standard deviation of score of hockey and football in Tidal Volume were 2.9 ± (.57) and 3.2 ± (.64) respectively. A mean difference of .278 between both groups yielded a significant 't' ratio of 1.247 which was found to be insignificant at 0.05 level of confidence. The required 't' value was 2.048. As result of the T test revealed that calculated value (1.247) is less than the tabulated value that is 2.048 or significant 2 tailed value (.223) is more than the 0.05 level of significance which indicated that both hockey and football players were insignificant difference statistically.

From the above result, it was revealed that the forced vital capacity (FVC) and Force Expiratory Volume in the first second (FEV1) are statistically significant which found that football players were significantly better in FVC and FEV1 than the hockey players. The calculated value was higher than the tabulated value so the Null Hypothesis of no real difference of football and hockey players was rejected with respect to the FVC and FEV1 but not in Tidal Volume.

Discussion:

On the basis of the result obtained it was concluded that the football players **FVC** and **FEV1** were better that the Hockey Players and statistically there is no difference found between football and hockey in Tidal volume. In forced vital capacity and forced expiratory volume in the first second **(FEV1)** footballer players were better than the hockey players. This may be attributed to the fact that football players who were as a subject in the study live in the north east region, so their genetically make up is advantageous which can improve their respiratory index than the hockey players. Physiological parameters like height, weight can affect the results. Larger body size player probably has larger lungs, this can differentiate the respiratory values.

Conclusion:

It was observed that that there were significant differences for forced vital capacity **(FVC)** and forced expiratory volume in the first second **(FEV1).** Football players were better in these respiratory parameters compare to hockey players. In tidal Volume there were no significant difference between football and hockey players

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