Design for Scientific RENAISSANCE

A comparative study of some physiological variations among the players who using weapons of the saber and foil in the sport of fencing

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ABSTRACT

The main aim of present study is to comparative some of physiological variations among the players who using weapons of the saber and foil in the sport of fencing. Twelve prospective fencing players aged more than 18 years are participated from sport Shalla club, divided in two groups one group included 6 players of saber weapon and second group included 6 players of foil weapon, researcher used descriptive design method with style of comparative study due to it is suitable to the nature of the study. Heart rate after effort directly, Vo2max, PWC170, systolic pressure, recovery after 3 minutes, voluntary capacity, and oxygen amount in comparison with expiration air tests were used to collect data. Some of the major findings are as follows: a) Study sample did not show a significant physiological changes among saber and foil weapons players; b) Saber weapon players did not appear a significant correlation between physiological changes just in recovery and systolic pressure indications; c) A positive correlation between heart rate after effort and recovery for study subject; d) A positive correlation between heart rate after effort and systolic pressure of the foil weapon players, as well as a significant correlation between systolic pressure and Vo2max for the players of foil weapon.

Keywords: comparative study, physiological variations, weapons, saber, foil, fencing.

1. Introduction:

Recent studies have concerned on the human body and his physiological functions in sport field which is a basic function and results in improve sport achievements for different games. The science, field research, and laboratory research are the first because they are a fundamental engine for this operation. However, most of people know the important of escorting the technological, scientific, and civilizational development in which we live now, fencing game is one of the sport games which has received considerable attention in the area of scientific research and studies due make a lot of Olympic medals, These developments oblige us to be makers of events but no spectators, so as not to be stricken by inertia, and we

find the world around us, which accelerated with the times in order to gain this development through the clear scientific vision. The standard which measures the nations and peoples is the extent of their interest in scientific and technological developments, sport is a human activity distinct won the attention of people in various projects and intellectual attitudes and we must deal with the extreme efforts and the potential for their independence and characterization in the service of sports activities of all types, as well as ignore the contemporary sport developments will lead to the long-term sport failure, furthermore, high achievements reached by the athletes in the sport of fencing in the three weapons (Foil, Epee, and saber) the requirements of those events to the speed of tolerances during the performance refers to the high levels in physiological and physical capacities that owned by athletes resulted from laboratory researchers where sport physiology contributes along with athletic training and other sciences, through attention to these physiological changes that occur directly as vessels responses in the body or as a result of adaptations to the vital organs as a result of continuous and regular training through using the scientific training method (Ghassan., 2005).

Fencing is one of the more suspense, watching, and follow-up games because of multiplicity of types of weapons in which the individual capacities between players in achieving the best achievements for the progress of the many gold medals in the Olympics. In addition, it is the motivating factor for the physical and motor integration, which is based upon sports games in their development, this study showed the need for an experiment curriculum built on a scientific fundamentals commensurate with its nature and the available needs as step to improve the level of sports for these events using the best methods and techniques of training. Sport training is one of operations must deal with it seriously due to we deal with human being who his body consists of billions of cells connect together to make functional systems which result in build the body, sport training helps to make suitable adaptations in vital systems according to circumstances and nature of athlete to reach to the best achievement (Abidullah Sallah., 1988). However, athlete body in general be in the steady-state and physiological variables are responsible for a stability and balance in the various body activities, It is no doubt the changes which occur in the body as a result of the training will return to the changes in the functional systems, may lead these changes in functional systems in the future to chronic adaptations affect positively or negatively, moreover, lead to instant and permanent changes which might be a hindrance or barrier to progress athletes in various achievements or terminate the life of athlete in order the coach

and athlete to be familiar with the positive and negative changes by preparing a standardized training curriculums with a scientific manner.

No study has compared between fencing players who using saber and foil weapons in physiological variables, where fencing game is characterized fast dynamic working which requires high ability of physiological organics coefficient for cardiorespiratory system that prepares the competitor to achieve the performance and achievement (Abidul Kareem., 1989). In dead, the researcher is tried to know the physiological variables between fencing players especially saber and foil weapons players for some of coaches make players of saber play instead of foil players because of the lack of specialists in all weapon, each skill has a special requirement, functional ability, tactical, and method of the distribution of time and effort into play during the competition. Fencing game is also one of games which is characterized short activities and its energy system is anaerobic system due to this activity requires instant response for competitor activity and high speed of movement as well as players have to has defense and offensive instruments (Ressan., 1973).

2. Methodology:

2.1 Participates:

Twelve prospective fencing players aged more than 18 years are participated from sport Shalla club, divided in two groups one group included 6 players of saber weapon and second group included 6 players of foil weapon, researcher used descriptive design method with style of comparative study due to it is suitable to the nature of the study, to know the suitable of participates to the nature of the study researcher achieved homogenies in age, height, and weight.

Table (1) shows homogenies of participates in age, height, and weight for both groups

Groups	Variables	Subject size	Mean	SD	Median	Skewness Coefficient	Type of distributer
Saber players	Height	6	173.51	4.87	172.85	0.343	Normal
	Weight	6	67.41	5.60	67.75	- 0.13	Normal
	Age	6	1990.83	0.75	1991	0.313	Normal
Foil players	Height	6	179.71	3.69	178.95	0.475	Normal
	Weight	6	72.91	7.26	74	- 0.178	Normal
	Age	6	1990.66	0.81	1990.5	0.85	Normal

2.2 Identify study variations:

We determined our study variables which regarding physiological variations depends on specific questionnaire which showed to number of experts who their area in field of sport physiology and fencing and we identified these variables rely on previous references (Arabic and English) languages, the number of experts was 10 expert and the ratio of acceptance of variables was (70%).

Table (2) shows number of variables and experts and percentage of validity of physiological variables.

N	physiological variables	Number of experts	Number of experts that agreed	Percentage
1	Heart rate after effort	10	10	%100
2	Vo2max	10	9	%90
3	PWC170	10	9	%90
4	Systolic pressure	10	8	%80
5	Recovery after 3 minuts	10	8	%80
6	Voluntary capacity	10	7	%70
7	Respiratory repeat	10	4	%40
8	Oxygen amount in comparison with expiration air	10	3	%30

2.3 Measurements:

2.3.1 Heart rate after effort:

The examiner places the headset on the chest of player in the top of the heart for a period of one minute and then be registered as a result of this measure in the form of each set of research groups.

2.3.2 Blood pressure (Systolic):

The researcher measured the systolic blood pressure after the effort of the players directly after sitting on the bench and his blood pressure is measured then the results are

recorded in a special form prepared for this purpose, for each study groups by using a pressure gauge.

2.3.3 PWC170: (Mudhafar., 1979)

Researcher depended on cardiorespiratory function test (PWC170) to measure physical efficiency and we used step test which including three heights (30 cm - 40 cm - 50 cm), researcher selected (40cm) due it is suitable to the subject of study, the test has been achieved by given two different physics efforts the period of first intensity (3 minutes) and then second effort for a period of (3 minutes) too.

2.3.4 Vo2max measure:

This indicator is very important for the sport (oxygen ability) which enters as part of oxygen work and it also reflects the maximum functional efficiency of the cardiorespiratory. We've been measured Vo2max non-directly by using the equation of Karimat depending on the value PWC170 as follows:-

VO2Max= 2.2 x PWC170 + 1070

2.3.5 Recovery aspect:

The examiner measured the heart rate for a period of one minute before starting of competition and after the race directly, the examiner also measured the heart rate for a period of 10 seconds and later multiply in (6) to make sure getting the recovery, the examiner also measured heart rate after three minutes from the end of competition as the player is relax and rest and then was taken heart rate after the end of the third minute for a period of 10 seconds after that the researcher calculated the percentage of recovery as following:

First step:

First value= pulse after effort – pulse before effort

Second value= pulse after effort - pulse after recovery

Second step:

$$\frac{100}{S} = \frac{\text{First value}}{\text{Second value}}$$

S= 0% and it is percentage of recovery \ 100= stable value

2.3.6 Maximum inspiratory valium:

We used spirometer to measure inspiratory speed, patient will put the mouthpiece inside his mouth and surrounding it by the lips and then start to expiration and inspiration maximally, repeat the operation to record the higher recording.

2.4 Statistical analysis:

Researcher used SPSS to analyze the data of present study.

3. Results and discussion:

Table (3) shows different significant of study variables

N	Variables	Saber players		Foil players		Calcu T value	Tabu T value	Significant
		Mean	SD	Mean	SD			
1	Heart rate during rest	68,83	4,02	68, 66	3,26	0,079	2,22	No S
2	Heart rate after effort	127	91,10	122,83	2, 299	0,902	2,22	No S
3	PWC170	819,16	44,54	866,66	43,20	1,875	2,22	No S
4	VO2max	819,16	218,51	1975	186,41	1,279	2,22	No S
5	Voluntary capacity	3916,66	318,85	3983,33	376,38	0,331	2,22	No S
6	Systolic pressure	146,66	11,25	150,83	13,93	0,57	2,22	No S
7	Recovery after 3 min	101	5,29	103,33	6,8	0,663	2,22	No S

Table (3) showed no significant differences between players of saber and foil weapons, researcher sees that physiological variables of saber players occupation within the same work and physiological adaptation which players of foil are working because they are working within the same energy system in terms of physiological variables such as (Heart rate after effort directly, Vo2max, PWC170, systolic pressure, recovery after 3 minutes, voluntary capacity, and oxygen amount in comparison with expiration air). Researcher agreements with Abu Alla and Mohamad (1997) where they mentioned that heart rate of an athlete is increased because of the response to the physical effort performed and this may be reach to (180-200) pulse per minute or more sometimes depending on the type of effort and duration of time, given the amount cardiac pumping among athletes when performing physical effort as it could be up to (25 - 35) litter / min, because the cardiac pumping increasing links extrusive to muscle work. Similarly, Mudhafar., (1984) confirmed that endurance training

effects positively on blood circle and heart working efficiency including slower of pulse during rest and size of the cardiac output (o.p) and the speed of the restoration of healing (recovery) after the effort.

VO2max relies on amount of oxygen consumed during effort by player but this an amount is affected by several factors, including psychological factors or tactic as well as the genetic factor where was found that a high percentage of maximum oxygen consumption capacity is influenced by genetic effect in addition to sports training, so VO2maz is considered one of the most important measurements to measure four vital systems during the performance such as respiratory system, circulatory system, blood and muscles, for this reason, physiological laboratories depend on VO2max to evaluate the physiological and training state of athlete.

In systolic pressure Kamal & Mohamad (1997) mentioned that the physical effort results in increasing the heart rate and contraction strength and then will lead to increase systolic pressure. Ausama (1999) agreed with them and he confirmed that systolic blood pressure has a positive relationship with heart working speed, moreover in case of an increase in the intensity of muscle working results in increase the need for oxygen. It is also noted that the need for oxygen rises sharply after physical effort leading to a high rate of recurrence of heart pulses as a result of the increase in the cardiac output into the aorta as a result of systolic force of the heart muscle which leading to velocity and force of blood flow in the arteries to reach the muscles.

Table (4) shows correlation coefficients for physiological variations and relation to players of foil weapon.

	PWC170	Heart rate during rest	Heart rate after effort	Recovery after 3 min	Systolic pressure	Voluntary capacity	VO2max
PWC170							
Heart rate during rest	0,05						
Heart rate after effort	0,192	0,25-					
Recovery after 3 min	0,418	0,446-	*0,963-				

Systolic pressure	0,332	589,-	*0,886	0,391			
Voluntary capacity	0,341-	0,468	0,15-	0,574	0,09		
VO2max	0,18	0,641	0,27	0,57	*0,93-	0,34	

- Significant correlations:

A positive significant correlation between heart rate after effort and systolic pressure was showed where calculated correlation value was (0.886) which is greater than tabulated correlation value amount to (0.81) at the freedom degree (4) and significant level (0.05) which means there is a positive relationship between the heart rate after the effort and the systolic pressure as pulse rate is increased results in increasing of systolic pressure. Ressan (1973) mentioned that the sport increases the blood pressure and this rise is fading after the completion of the performance, the lower blood pressure and the number of pulses of the heart are one of the measurements of the good training state reached by the athlete as well as systolic blood pressure influences by the heart rate after physical effort, any increase in heart rate or heart pulse increase of systolic blood pressure where the highest value is (254) mm / Hg, usually the intensity in this group is high during training or competition as well as the high of heart rate after the effort.

A negative significant correlation between heart rate after effort and recovery after 3 minutes was exposed where calculated correlation value was (- 0.963) which is greater than tabulated correlation value amount to (0.81) at the freedom degree (4) and significant level (0.05) which means there is inverse relationship between the heart rate after the effort and recovery, if the recovery is increased the heart rate will be reducing. Mudhafar., (1984) said that endurance training effects positively in blood circle and heart efficient and its different indicators including pulses during rest.

A negative significant correlation between systolic pressure and VO2max was showed where calculated correlation value was (- 0.93) which is greater than tabulated correlation value amount to (0.81) at the freedom degree (4) and significant level (0.05). Researcher attributes the significant correlation to the speed and strength of amount of blood bearing oxygen through the arteries and capillaries to the muscles involved in the work, where the respiratory system is very important to achieve many requirements during the sporting activity in collaboration with the circulatory system effectively and then will help to achieve the process of oxygen supply and get rid of carbon dioxide which increases its requirements

during the sporting activity. Blood flow loaded with oxygen through the arteries leads to generate intense pressure on the walls of these arteries and increase systolic blood pressure (Abou El Ela., 1999) during physical effort so the measure of maximum oxygen consumption is a measure of the integrated four most important vital organs during a performance of respiratory, circulatory system, blood, and muscles so dependent upon the physiological factor to evaluate the state of training and physiological athlete. In similar, Mohamad (1999) showed that physiological, functional, and physical adaptations are occurred because of the athlete undergoes to regular training programs.

- No significant correlations:

No significant positive correlations between (PWC170 and heart rate during rest), (PWC170 and heart rate after effort), (PWC170 and recovery), (PWC170 and systolic pressure), (heart rate during rest and voluntary capacity), and (heart rate during rest and VO2max) were showed as well as a significant negative correlations between (PWC170 and voluntary capacity), (PWC170 and VO2max), (heart rate during rest and heart rate after effort), (heart rate during rest and recovery), (heart rate before effort and heart rate after effort and voluntary capacity), (heart rate after effort and VO2max), (recovery and voluntary capacity), (recovery and systolic pressure), (recovery and VO2max), and (voluntary capacity and VO2max) were appeared. These no significant correlations refer to variables affected by other variations such as training phases or lack of appropriate equipment for measuring or training programs that non-programmed and were followed towards the game as it's a game you need to functional capabilities of a high consensus towards the development of the neuromuscular system.

4. Conclusion:

Findings of our study are as follows: a) Study sample did not show a significant physiological changes among saber and foil weapons players; b) Saber weapon players did not appear a significant correlation between physiological changes just in recovery and systolic pressure indications; c) A positive correlation between heart rate after effort and recovery for study subject; d) A positive correlation between heart rate after effort and systolic pressure of the foil weapon players, as well as a significant correlation between systolic pressure and Vo2max for the players of foil weapon.

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