The homocysteine relationship with the cardiorespiratory fitness level of practitioners and non-practitioners of physical activity For older persons

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Abstract:

The aim of this study is to identify the homocysteine relationship with the level of cardiorespiratory fitness of the practitioners and non-practitioners of physical activity from the elderly through. Identification of homocysteine concentration in the research sample, Identification the level of cardiorespiratory fitness in the research sample , Identification of the relationship between homocysteine concentration and cardiorespiratory fitness in a sample. The researcher used the" Balcke and Ware test "and applied it to the apparatus for measuring heart and lung efficiency during the effort (Ergospirometry Zan 680), The researcher used the descriptive method. The study was conducted on a sample of 14 individuals aged 50-60 years of Mansoura University workers, divided into two groups, the first includes 7 members of participants in the fitness center at Mansoura University, and The second group includes 7 individuals who are not practicing any physical activity, were analyzed the data statistically using the statistical program spss and calculate the averages, the average level, the total level, the value of Mann Whitney test and the pearson correlation significance. The most important results were the level of homocysteine in practitioners of physical activity in the normal level and a high in non-practicing physical activity in a sample search,. There were statistically significant differences in the level of cardiorespiratory fitness among practitioners of physical activity and non-practitioners for the practitioners group in the research sample, There is a statistically significant inverse relationship between the level of homocysteine and cardiorespiratory fitness in a sample search. The most important recommendations were, the need to follow the level of homocysteine to the elderly continuously, interest to measurements of heart and lung function in older persons

Key words: Homocysteine, Cardiorespiratory fitness, older persons

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Introduction and problem of research

The recent nature of life has led to many health problems related to the cardiovascular system, depending on the machine in fulfilling all the requirements of life and the tendency to idle and lack of movement. Recent scientific studies indicate that there is an amino acid, "Homocystiene", which has a direct role in Heart disease especially in the elderly where physical activity is low. Homocysteine increases in aging to narrowing of blood vessels and arteriosclerosis, as the study by Darkner, R. (2004) (9) shows that homocysteine is a risk factor for the heart and blood vessels.

According Both the (Chan, et al. 2003, Mahfouz, 2006, Riad, 1998) (7) (17) (21) The Evaluation study of the level of physical fitness and functional to devices of the body and one of the trends that focus the attention of researchers in the field of sport physiology in order to stand on the evaluation the optimal level of physical fitness, and that to know the extent of adaptations and physiological changes and the extent of the level of fitness that have samples of That research.

Both are mentioned (Hazza and Alhoikan 2002) (12) to use the test of physical effort with measuring functions cardiorespiratory was monopolized by a few specialized in Europe and North America medical centers. Today, the measurement of cardio-respiratory functions during physical effort has become a Commonly used in many hospitals and medical centers in many countries of the world and is increasingly being used as a non-expansionary method of diagnosing functional impairment and evaluating the functional status of many different body systems

Muhammad Ajrama and Sadqi Salam (2005) (4) point out that one important fact is that one of the results of metabolism is the production of a homocysteine protein, one of the factors that causes aging, but an increase of folic acid and a complex vitamin B can weaken the effect of This protein.

The results of Faeh David (2006) (11) and Akram Saleh (2010) (5) agree that heart disease is one of the leading causes of death worldwide and there are many major causes such as stress, diabetes, cholesterol and smoking. Homocysteine (HCY) may be one of the factors that increase the risk of heart disease and arteriosclerosis. Increasing people's knowledge of homocysteine and lowering methods may reduce the incidence of homocysteine, which is deposited on walls. The internal blood vessels cause Blockage of blood vessels.

Darwish Afaf and Bureka Mohamed (2000) (10) point out that the human body changes and its different devices change according to the increase in the age of the individual and his development in his life from childhood to adolescence to adulthood and then to old age. The Functions of body depend on the composition of the body, and different from age to another age followed, and from one stage to another tracked. Men under the age of 65 are three times more likely to develop heart disease than women

The researcher considers that cardiorespiratory fitness and the problems related to the risks to the elderly as a result of the increased level of homocysteine in blood have a very important impact in determining the features of life and health aspects of the individual in old age. This research also addresses the elderly as a group of society able to work and production at this stage From the stages of life, and how to save and improve their ability to work and production for advanced stages of age, especially because of the characteristic of this stage of expertise. The results of this research may be used to plan appropriate sports programs at this age, and may be used in the planning of other programs for more advanced stages of life.

And through the researcher's knowledge of research and related studies and within the limits of the researcher's knowledge did not find any study linking the effect of physical activity on cardiorespiratory fitness and the level of homocysteine in

the elderly. The researcher wanted to benefit from modern devices in this field, such as a device to measure the efficiency of the heart and lungs during the effort to give accurate results, which prompted the researcher to conduct this study.

Aim of Research:

- Identification of homocysteine concentration in the research sample.
- Identification of cardiorespiratory fitness level of research sample.
- Identification of the relationship between homocysteine concentration and cardiorespiratory fitness in the research sample.

Questions of Research:

- What is the level of homocysteine concentration in the research sample?
- What is the level of cardiorespiratory fitness in the research sample?
- What is the relationship between homocysteine concentration and cardiorespiratory fitness in the research sample?

Research terminology

Homocysteine (HCY): Is a sulfuric acid that is closely associated with methionine and cysteine. It is naturally formed in the body. All homocysteine in all organisms is formed through the metabolism of methane essential amino acid through the methylene cycle.

cardiorespiratory fitness: Is the ability of the circulatory and respiratory systems to take oxygen and transfer it and then extracted by the cells of the body to provide energy for physical effort.

Materials and methods

The researcher used the descriptive method in this study.

Sample:

- The study was conducted on a sample of 14 individuals aged 50-60 years of staff at Mansoura University and were divided into two groups as follows:
- The first group includes 7 individuals (G1=7), of the physical fitness practitioners on a continuous basis(3 unit in week) and participants in the fitness center at Mansoura University.
- The second group includes 7 individuals (G2=7), who are not practicing any physical activity.

Basis of selection of the research sample

- Approval of the sample to conduct the research
- The members of the sample are not infected with any diseases
- The sample should be non-smokers.
- The measurements conducted in laboratory of Sports Physiology, Faculty of Physical Education - Mansoura University, Egypt.
- Measurements were conducted in the period from 28-30/1/2017.

Research methods of measure the variables:

The researcher used the Polk and others test (Balke and ware) Citing (Radwan, 1998) (19) was applied on apparatus (Ergospirometry Zan 680) to measure the cardiorespiratory fitness, and the test as follows:

1- The type of pregnancy: ongoing pregnancy
2- The case of the laboratory: normal People..
3- Start: Physical load (speed at 3.5 miles/hour for 1 min, degree of miles 0%).
4- Test time: 14 min connected
5- Degree miles of apparatus: it starts by zero% for 1 min, then increase by 2. % every 1min.

The researcher measured cardiorespiratory fitness variables which contain :

- Heart rate (HR)
- the rate of oxygen consumption with each pulse of a heartbeat (O_2PLUS)
- Ventilation in liters (VE)
- breath frequency per minute (BF)
- The maximum oxygen consumption of absolute and relative (VO_2) (VO_2/Kg),
- production rate of carbon dioxide (VCO_2),. (Attachment 2)

For the statistical analysis, the SPSS (SPSS for Windows, version 17.0) program was used for the statistical evaluation of data Mann Whitney U test was used for significance testing as non-parametric tests and calculate the Mean, Std.deviation, the Mean Rank , the Sum of rank , the P. value and the significance.

Results and discussion:

Table (1)

Shows Basic variables of the research sample(n 1 = n 2 = 7)

Variables	Unit	Group	Mean	Median	Std.deviation	sekwanes

	of meas					
Age	Year	G1	56	57	3.1	-1.397
		G2	55.14	55	2.41	0.367
High	CM	G1	171.14	172	3.93	-0.149
		G2	172.14	174	3.02	-0.443
Weigh	Kg	G1	73.57	74	2.22	-0.132
		G2	85.85	74	7.01	-0.651

Table (1) shows that the skewness of the variables is limited to ± 3, indicating the distribution of the sample.

Table (2)

The significant differences between groups in variables.

Variable	Unit	Number		Mean		Mean Rank		Sum of rank		z	p. value	Sig.
		G1	G2	G1	G2	G1	G2	G1	G2			
HCY	Mmol/dl	7	7	13.38	23.11	4	11	28	77	-3.134*	0.002	yes
HR	b/min	7	7	140.28	160	4	11	28	77	-3.134*	0.002	yes
VO2	l/min	7	7	3.58	2.37	11	4	77	28	-3.134*	0.002	yes
VO2/Kg	ml/min	7	7	48.65	27.21	11	4	77	28	-3.151*	0.002	yes
VCO2	l/min	7	7	3.15	2.04	11	4	77	28	-3.137*	0.002	yes
O2PULS	ml/beat	7	7	25.14	17.71	11	4	77	28	-3.141*	0.002	yes
VE	l/min	7	7	75.14	52.85	10.86	4.14	76	29	-3.006*	0.003	yes
BF	1/min	7	7	33.28	50.71	4	11	28	77	-3.134*	0.002	yes

Table (3)
shows the relationship between homocysteine and cardiorespiratory fitness of group1 (practitioners of physical activity)

S	Variables	HCY	
		Correlation	Sig
1	HR	*0.869	0.011
2	VO2	*٠.٩٦٢-	٠.٠٠١
3	VO2/kg	*٠.٨٦٩-	٠.٠١١
4	VCO2	*٠.٧٧١-	٠.٠٤٢
5	O2 Puls	*٠.٨٠١-	٠.٠٣٠
6	VE	*٠.٨٢٦-	٠.٠٢٢
7	BF	*٠.٩٤٨	٠.٠٠١

Table (4)
shows the relationship between homocysteine and cardiorespiratory fitness for group 2 (non-physical activity)

S	Variables	HCY	
		Correlation	Sig
١	HR	*٠.٩٥٤	٠.٠٠١
٢	VO2	*٠.٩٦١-	٠.٠٠١
٣	VO2/kg	*٠.٨٥٧-	٠.٠١٤
٤	VCO2	*٠.٨٤٣-	٠.٠١٧
٥	O2 Puls	*٠.٩٩٢-	٠.٠٠٠
٦	VE	*٠.٨٢٦-	٠.٠٢٢
٧	BF	*٠.٩٢٤	٠.٠٠٣

Discussion of results

- Discuss the results of the first question:

Table (2) shows that the mean of homocysteine concentration in the first group was (13.38) and the second group was (23.11) indicating that the level of homocysteine concentration in the first group (the practice of physical activity) is less than the second group by a statistically significant difference The value of z = -3.134

The results of the study of Aajab Mohamed (2001) (3), khoja Samir (2003) (15), Jorge molina (2013) (13) found that high levels of homocysteine

usually increase or lead to heart disease in both sexes and females and can be reduced by proper nutrition and regular physical activity .

Kilmer McCully and Martha McCully (2000)(16) explained that one of the greatest benefits of aerobic exercise, endurance and lengthening exercises is to reduce blood homocysteine levels. It is not too late to practice aerobic exercises, especially for older people. In general, the normal homocysteine levels in men are 8: 14 μm / dl and for females of 6: 12 μm / dl.

Hence the answer to the first question is that the level of homocysteine in the first group practitioners physical activity is better than the level of the second group non-practitioners.

Discuss the results of the second question

Table (2) shows statistically significant differences between the two groups in the cardiorespiratory fitness parameters in favor of the first group, which indicates that the level of cardiorespiratory fitness of the primary group is better than the second, where z is the value of the differences between the HR variables, the maximum (VO2), maximum oxygen consumption (VO2/ Kg), oxygen consumption ratio with each pulse of the heart (o2 plus), ventilatory ventilation (VE), breathing rate (BF), respectively -3.134, -3.134, -3.151, -3.137, -3.141, -3.006, -3.134.

The researcher attributed these differences in favor of the first group to the practice of regular physical activity exercise, which led to an improvement in the level of cardiorespiratory fitness and reduced the level of concentration of homocysteine.

This is consistent with Christina Bolander (2003) (8). The low homocysteine concentration was demonstrated by the Hordaland report on the study of homocysteine in middle-aged men and women who exercise regularly in the medium intensity. The difference was more pronounced among older

persons Regular lifestyle and those who practice daily activity in this age group.

Abu Alaa Abdul-Fattah (2003) (2) There are physiological changes occurring in the human body and its organs with age. In the developmental stages, the processes of building in the body tissues exceed the demolitions. After the body reaches a certain stage at maturity, the demolitions begin to increase and continue at different rates to the end of life. A continuous decrease in muscle mass and non-fatty tissues, which causes a decline in the vital functions of the body's various organs. Therefore, exercise of the physical activity of the elderly makes them the best and best form

The answer to the second question is that the level of cardiorespiratory fitness in the group exercising physical activity is better than that of the inactive group of physical activity.

Discuss the results of the third question:

Table (3) and Table (4) A statistically significant relationship between homocysteine and pulse rate and respiratory rate and an inverse relationship with statistical significance between it and other variables. The maximum limit for absolute and relative oxygen consumption and the rate of carbon dioxide and oxygen consumption with each pulse of the heartbeat and pulmonary ventilation. Which confirms that the higher the level of homocysteine was a sign of the poor level of cardio-respiratory in the elderly and the least evidence of improvement in the level of cardio-respiratory.

This is in line with the findings of the Marianne Atef study (2004) (6) and the study of Joubert (2006) (14) that increasing the concentration of homocysteine leads to the formation of venous thrombosis and also helps to reduce the widening of blood vessels by accumulating on walls lining the blood vessels, On the efficiency of the heart muscle.

Hence, the answer to the third question is that the relationship between homocysteine concentration and cardiorespiratory fitness in the study sample is inversely related

Conclusions:

1- level homocysteine practitioners of physical activity in the natural level and high non-practitioners of physical activity in the research sample

2- There are statistically significant differences in the level of cardiorespiratory fitness between practitioners of physical activity and non-practitioners for the benefit of practitioners in the research sample.

3- There is a statistically significant inverse relationship between homocysteine level and cardiorespiratory fitness in the research sample.

Recommendations:

1- Dependence on the results of the current study, when studies linked.

2- The need to follow the level of homocysteine to the elderly on a continuous basis..

3- The need to pay attention to measurements of the functions of the heart and lungs of the elderly.

4- The need to conduct studies linked to various sports activities.

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