International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 02, 2020
ISSN: 1475-7192

The effect of iron supplementation on the speed of cardiac recovery for some young female trainees

Dr. Ali Zuheer Hassan [1]

Abstract
The aim of this study is to identify the effect of iron supplementation on the speed of cardiac recovery for trained women. We have noticed that many of the trained women have cardiac recovery problems and slowed after physical effort to recover the heartbeat, as the relationship between anemia and physical activity has been widely studied. Because anemia also affects female athletes, anemia can lead to physical stress, fatigue, and functional disorders. Given that blood functions are the transport of oxygen, food, and biological compounds to tissues, especially the compound hemoglobin and iron, which play a central role in cardiorespiratory homeostasis, it has been suggested that physical activity in and of itself can be a cause of anemia. It is believed that the combination of insufficient food intake and menstrual losses is the main cause of anemia in women, as well as the fluctuation of hemoglobin concentration in women, especially during and after the menstrual cycle. The experimental method was used for its suitability and the nature of the research, as the research community was deliberately chosen, which numbered (6) trainees, and after presenting the results, analyzing and discussing them, the researcher concluded that iron compounds contributed and had a positive effect on the speed of cardiac recovery of the trainees.
Key words: *Iron Supplements -Cardiac Recovery- female trainees*

Introduction

Presenting and investigating problems according to physiology and sports medicine is of great importance as it is one of the sciences that show and reveal the causes and give results according to a set of modern scientific means. Physical fitness is the basic rule in sports performance, as well as its importance in diagnosing and knowing the individual differences between athletes and others in terms of achievement and health. It is worth noting that the physiological, morphological and physical differences between men and women are diagnosed and clear to specialists in the field of physical sciences. Iron deficiency anemia is a major public health problem in the world as it can have negative effects on the functional and physical abilities of athletes. There is a clear gender difference in iron deficiency anemia (IDA) as it is more prevalent among women.(19,10) The relationship between anemia and physical activity has been studied extensively because anemia also affects female athletes. An abnormal hemoglobin concentration has also been reported in athletes and has been called "sports anemia."

Various mechanisms have been proposed for anemia in athletes, for example, increased iron loss through sweating, mechanical intravascular hemolysis, pseudo-anemia. Additionally, it has been suggested that physical activity itself can be a cause of anemia. The combination of insufficient food intake and menstrual losses is believed to be the main cause of anemia in women.(3)

In theory, reduced oxygen carrying capacity impairs aerobic capacity, while decreased tissue oxidative capacity impairs endurance and energy efficiency. (6) It is clear that anemia per se results in decreased aerobic capacity (9) and that reduced exercise capacity in turn impairs endurance and energy efficiency. Affects the ultimate performance ability of top level athlete. (11)

Therefore, in the current research, we try to verify and identify the role of iron supplements, which can play a pivotal role in the cardiac recovery process for some trainees during and after physical exertion and the relationship of iron compounds concentration to the speed of cardiac recovery for some female trainees at Al-Mustansiriya University, as the iron complex plays a vital role in improving Hemoglobin levels and the process of transporting oxygen from the lungs to the various tissues and cells of the body. There is no doubt that this aspect is of great importance, both in terms of health or in terms of application of the physical sciences, so we try to provide indications to support the theoretical and applied hypothesis about the relationship between improving the level of hemoglobin concentration through iron supplementation and

[1]Lecturer, Dr. Student Activities Department - Al-Mustansiriya University-IRAQ
alialisarag4@gmail.com

cardiac indicators represented by the heart rate as one of the biophysiological factors in The human body is associated with performance and functional recovery.

Research Problem

The researcher noticed that many of the trained women have a slow process of functional recovery after performing physical exertion, and the lack of hemoglobin concentration leads to anemia, physical stress, fatigue and functional disorders, as the most important functions of the blood is the transport of oxygen, food and biological compounds to the tissues, especially the hemoglobin complex. Which plays a pivotal role in cardiorespiratory homeostasis as the researcher noticed that the level of hemoglobin concentration in women fluctuated, especially during and after the menstrual cycle, as some female trainees have varying degrees of functional and physical development, and one of the degrees of disparity is anemia in women, as it is still One of the common physiological problems in many developing countries, especially in cases of malnutrition and pregnancy, and the most important factor in detecting the level of anemia is measuring the concentration of hemoglobin in the blood. Pale skin and a rapid heart rate, as well as a deficiency in respiratory functions, especially for women after physical exertion, so the researcher decided to conduct a new study that reveals and repents. The effect of iron supplementation on the speed of heart recovery for some female trainees after physical exertion.

Aims

-Identification of the effect of iron supplementation at the rate of cardiac recovery (heart rate) of the research sample.

Hypotheses

-There are statistically significant differences between the pretest and the post test and in favor of the post test.

Methodology

The researcher used the experimental approach in the manner of one group of women (those with anemia and the hemoglobin level is below the normal level).

Participants

The research sample was deliberately chosen from a group of trainees at Al-Mustansiriya University in the capital, Baghdad, from the research community, whose number is (12) trainees representing the original research community, and the research sample included (6) trainees from the research community who constitute a percentage of (50%)) From the original community, as the researcher used an experimental method with one group, as a pre-test (before using the iron supplement) and a post test for the same group after using the iron supplement.

Table (1) parametric properties of the participants

Variables	Mean	SD ±	Median	skewness
Age / year	22.5	1.507	22	0.831
Height / cm	159.5	1.783	159	0.602
Body mass / kg	65	3.938	65	1.753

Pre-test and measurements

The laboratory tests of the research sample related to hemoglobin concentration and heart rate were performed before starting the implementation of the dose (response) to the physical effort in the study and under the supervision of the assistant work team, as the researcher sought to record the conditions related to all the tests and record them in terms of time, place, devices, tools and method of implementation in an attempt From it to create the same conditions and conditions as when performing the post-effort test.

Preparing doses of iron supplement

Doses of iron supplement were prepared for the experimental group according to the recommendations attached to the supplement box and the recommendations of specialists from pharmacists, at the rate of one dose per day, as the duration of taking the supplement was 8 weeks at 7 doses per week.

The final test

The final test was performed for the research sample after taking the iron supplement dose and knowing and determining the recovery time according to the three stages after the (1,2,3) minute. There are preliminary examinations.

Statistical Analysis:

- The researcher used the Statistical Package (SPSS) version 17 in processing the results to reach the achievement of the research objectives.

Discussion

Table (2) shows the results of the physiological tests for heart rate (HR) in the pre and post test.

Variables	N .P	Pre test		Post test		Sig	Significance
		Mean	SD ±	Mean	SD ±		
(HR) Rest time	6	84.10	1.791	74.00	2.05	.001	significant
(HR) After the effort direct	6	169.33	5.988	163.16	1.722	.003	significant
(HR) after 1 min	6	158.16	7.467	142.50	2.738	.004	significant
(HR) after 2 min	6	129.83	3.340	110.50	2.167	.000	significant
(HR) after 3 min	6	100.83	5.913	91	6.782	.001	significant

Tables (2) show that there are significant differences between the results of the pre and post tests in the functional indicators represented by (heart rate), and in favor of the post tests, and the researcher attributes the reasons for this to the adaptation of the work of the circulatory and respiratory systems during physical exertion and to meet the requirements of the working muscles of oxygen resulting from Functional homeostasis of the state of the circulatory system, which is one of the most important hospital factors for the development of physiological indicators for athletes and others, as well as the level of hemoglobin concentration, which has an effective role in transporting O2 to the various tissues and organs of the body, either changes in the heart rate at rest and during and after physical exertion is one of the important indicators Because of the capacity of the cardiovascular system, the increase that occurs to him during the effort and the time of his return to his state, "nature quickly after the end of the effort is a distinct relationship (to the health) of the athlete's body and a clear indication of the accustomed cardiovascular system to physical effort." (2) All scientific sources agreed that the response and adaptation of HR during exertion and distance is a natural matter in response to the physical exertion, whether by using exercises for the lower or upper extremities, and this occurs as a result of muscular work and the necessity to fill the existing muscle requirements with exertion. The energy that the heart and circulatory system provides by increasing the heart rate or the size of the stroke.

The researcher attributes the interpretation of this result to the fact that the participants had a balance between iron intake and iron losses over a period of up to 3 months, while the same sample before taking iron supplements had an imbalance of balance, through greater menstrual losses, which explains an increase in the incidence of anemia. With increased physical exertion. The proposed mechanisms of sports anemia included increased iron demand or increased losses through sweating, (8) through mechanical intravascular hemolysis, (17) or through the gastrointestinal tract. (15) And sports anemia today is not considered a true anemia by most researchers. . Thus, the most common cause of anemia among females is an imbalance between dietary intake(12) and blood loss. The combination of higher iron intake and less menstrual loss can help maintain iron stores in young female athletes, given that there is no depletion. High in iron that accompanies physical activity. We recommend that the mathematics be evaluated at regular intervals for hemoglobin level and iron status.(18) We recommend trying iron supplements for at least 3 months, since some people may have relative anemia.

(Ammar Jassim 2006) pointed out that the level of HP plays an important role in the transport of (O2, CO2), and in the event of its decrease in the blood, it will negatively affect the level of performance and the weak level of the athlete due to the deficiency of the amount of O2 reaching the muscles, and consequently the increase in the cardiac burden through an increase in the heart rate HR. (3). (Abu Al-Ela) indicated that the importance of oxygen lies in replacing the body's stores of it and meeting the needs of the heart muscle, muscles and breathing (1), and pointed out that the lack of HP level in the blood below the normal level in males or females leads to a lack of oxygen consumption (1) . This is an indicator that confirms to us the

integrity of the heart to fulfill its requirements, and that the adaptation occurring in the cavities of the heart muscle by increasing them and absorbing them into larger quantities of returning blood leads to the irrigation of the cardiac muscle fibers, and this in turn leads to economical work of the heart and lowering its rates from the normal level as it secures the body's needs. From this rate, as lower heart rates at rest mean savings in oxygen consumption in the heart muscle and economy in its mode of operation, and this factor has a direct correlation with the level of hemoglobin concentration in the blood, and the slow heart rate has a positive effect in athletes as a result of an increased duration The ventricles are filled with blood, and this in turn leads to an increase in the supply of oxygen to the heart muscle, as the heart, through the increase in blood volume in one batch (Strock Volume), is able to push the same amount of blood with fewer strokes.(13)(16)
The higher the levels of hemoglobin concentration in the blood, the greater the amount of oxygen contained in the muscle, which is the other serving the process of energy oxidation and the adaptation of the cardiovascular system and thus meets the requirements of physical effort. "It has also been shown that the total volume of hemoglobin and the number of red cells is higher in well-trained athletes. This means an increase in the oxygen capacity to meet the needs of the body and working muscles" (5)
Also, the main role of hemoglobin in transporting oxygen to tissues is the reason for the ability to work and physical performance, in contrast to those with low hemoglobin concentration (7).
The decrease in hematocrit, as in anemia, reduces the oxygen content and viscosity in the blood, the former reduces the oxygen supply to tissues and cells and the latter increases blood flow and thus increases blood fluidity and is expressed in an inverse relationship, as the abundance of red cells increases the oxygen content but reduces Blood flow. (4)As the oxygen concentration is lower, and therefore the oxygen saturation in the blood is low, as the hematocrit, level when it is fairlylarge is useful in sports. High endurance is more effective during increased demand for oxygen, and this is the most important reason why some athletes use iron compounds to meet long physical exertion requirements (14)
Also, oxygen plays an important role in functional processes, whether during or afterexertion or at rest time, and it is more important when fulfilling the requirements of physical activity. He pointed out that the decrease in the HP level in the blood below the normal level in males or females leads to a decrease in oxygen consumption (1), and it is worth noting that the more phosphate depletion, the greater the oxygen consumption during hospitalization .(11)

Conclusions

-Significant differences appeared between the pre and post tests, in favor of the post, and after taking iron supplements, as it contributed to an increase in the HP concentration level and the speed of heart rate recovery for the three periods.
- Taking iron supplements and concentrating hemoglobin levels within normal limits has a positive effect in meeting the physical exertion requirements of women, especially novice women, as it greatly contributes to the speed of cardiac recovery as well as the ability to endure performance.

References

1-Abu El-Ela Abdel-Fattah and Mohamed SobhiHassanein; Mathematical physiology and morphology, methods of measurement and evaluation, 1st Edition: Cairo, Dar Al Fikr Al Arabi, 1997.P294-353
2- Ahmed Nagy Mahmoud; Oxygenic ability of Iraqi runners to run long distances (unpublished master's thesis, College of Physical Education, University of Basra, 1988. P25
3- Ammar Jassim Muslim: The Heart of the Mathematician, Baghdad, Ibb Press, 2006 P 96
4- Ashenden MJ. Serum ferritin and anemia in trained female athletes. Int J Sport Nutr. 1998;8:223–229.
5- Bahaa El-Din Ibrahim Salama: The Biochemical Properties of Sport Physiology, Egypt, Arab Thought House, 2002 P202
6- Davies KJ, Donovan CM, Refino CJ, et al. Distinguishing effects of anemia and muscle iron deficiency on exercise bioenergetics in the rat. Am J Physiol. 1984;246:E535–E543.
7- De Mayer: Iron-deficiency anemia. Publications of the World Health Organization. 1990 P10
8- DeRuisseau KC, Cheuvront SN, Haymes EM, et al. Sweat iron and zinc losses during prolonged exercise. Int J Sport NutrExercMetab. 2002;12: 428–437.
9- Gledhill N, Warburton D, Jamnik V. Haemoglobin, blood volume, car- diac function, and aerobic power. Can J Appl Physiol. 1999;24:54–65.
10- Hallberg L. Perspectives on nutritional iron deficiency. Annu Rev Nutr. 2001;21:1–21.
11- Helgerud J, Engen LC, Wisloff U, et al. Aerobic endurance training improves soccer performance. Med Sci Sports Exerc. 2001;33:1925–1931.
12- Hoppe M, Sjöberg A, Hallberg L, et al. Iron status in Swedish teenage girls: impact of low dietary iron bioavailability. Nutrition. 2008;24:638–645.

13- Mahfouz Faleh Hasan: The effect of controlling rates of velocity and angles of incline on the responses of the respiratory and circulation systems and the time of electrical activity of the heart muscle: (Master thesis, Basra University, College of Sports Education, 2003 P29.
14-Mohammad J. Kudher. EVALUATION OF HAEMOGLOBIN DETERMINATION USING SODIUM LAURYL SULFATE FRCPath, Raad J. Musa1 MSc, FICMS.P 7
15- Peters HP, Wiersma WC, Akkermans LM, et al. Gastrointestinal mucosal integrity after prolonged exercise with fluid supplementation. Med Sci Sports Exerc. 2000;32:134–142.
16-Rushdi Fattouh Abdel Fattah: General Fundamentals in Physiology, Kuwait: Kuwait University Press, 1984 P86-87
17-Sarada, Subrahmanyam, K. Madhavankutty: Text book of human physiology, Third Edition. S. Chand and company (pvt) L T D. New Delhi, 1987.P 71-74
18-Telford RD, Sly GJ, Hahn AG, et al. Footstrike is the major cause of hemolysis during running. J Appl Physiol. 2003;94:38–42.
19-Zimmermann MB, Hurrell RF. Nutritional iron deficiency. Lancet. 2007; 370:511–520.