Ferrotron, Traditional Iron Salts and Physical Activity Efficiency on Anemic Female Students

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Abstract: The aim of the study was to investigate the effect of Ferrotron, traditional iron salts and physical activity on anemic female students. It is hypothyzed that ferrotron, traditional iron salts together with physical activity can efficiently help curing anemic female students. The experimental method: of pre-post measurements was used, (40) anemic female students participated to the study from the students of faculties of Assiut University branch of the new valley except for the Faculty of Physical Education. All of them are residents of the university city of Al-Kharga students in the New Valley Governorate, they were divided into four equal groups, ten each, 1st group ingested "ferrotron" with exercise, 2nd group ingested "ferrotron without exercise", 3rd group supplemented with traditional iron salts with exercise, 4th group supplemented with traditional iron salts without exercise. The results of the study, indicated that ferrotron and iron supplementation induced an improvement of the physiological variables (Hb, iron, ferritin, O_2, pulse rate and $VO_{2\ max}$) for the favour of ferrotron, physical activity induced positive results in contrast with non-sports activity on anemic female students. In conclusion, ferrotron, iron supplementation together with physical activity can affect efficiently anemic female students, with the higher score related to ferrotron due to the faster increase in hemoglobin and minimal side effects than traditional iron salts. It is recommended to use ferrotron supplement together with sport for anemic cure.

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Keywords: ferrotron, traditional iron salts, physical activity, anemic female students.

Introduction

It was noticed that some of the female university students fell and injured during the exercise. The examination indicated that the reason is iron deficiency.

According to the reports from the world health organization (WHO, 2001), there are more than a billion-anemic people in the world, in men and women, though it is more prevalent in women of all ages (WHO, 2002), and nutritional iron deficiency was reported to be one of the risk factors for death around the world, despite the great variation between and within the countries.

The epidemic of anemic-related chronic diseases is crippling health care services and costs, as it challenges health care and preventive health services to prompt action, to minimize the rise in the incidence of anemic-related diseases with their complications, factors that contribute to this change come from urbanization which is accompanied by decreased physical activity levels and major change in dietary habits and iron deficiency and other minerals including copper and selenium (Gropper et al., 2003) and (Tapiero et al., 2001).

Attention to iron metabolism is particularly important in women, adults females are more prone to iron deficiency due to lose excessive blood during menstruation and iron deficiency anemia due to inadequate intake, inadequate utilization or even excessive loss of iron is one of the most prevalent conditions in medical practice (Adamson, 2008).

Adamson and Longo (2008) added that ferritin is a protein of importance in the metabolism of iron, it stores iron that can be called when required. In excess iron, much ferritin is present. Measuring of ferritin serves as an index of body iron stores. Ferritin and hemoglobin, Rbcs, are the main lab. Tests for assessing of iron disorders. The red, oxygen carrying pigment in red blood cells is hemoglobin, a protein with a molecular weight of 64, 450. It is a molecule made up of four subunits, each unit contains a heme conjugated to poly peptide. Heme is an iron-containing porphyrin and the polypeptides are referred as globin. There are two pairs of polypeptides in each hemoglobin molecules, alpha chains and beta chains. Hemoglobin binds to oxygen to form oxyhemoglobin, O_2 attaching to the Fe^{++} in the heme (Maloney, 2015). He added that the affinity of hemoglobin for O_2 is affected by many factors namely pH, temperature and the concentration in the red cells of 2,3 biphysphoglycerate (2,3-BPG) which H^+ compete with O_2 for binding to deoxygenated hemoglobin.

Clifford et al. (2015) reported the important role of iron in both for mation of hemoglobin of the blood and myoglobin of the skeletal muscle, iron is also

involved in many reactions within the body for the production of energy (Mougios, 2006).

Physical activity is an essential part of the life style as it is important for growth and development of children and youth. Physical activity contributes to a lower risk of many diseases included anemia. Therefore, physical activity has been described as public health "best buy" and fitness is associated with a lower mortality rate (Kodama et al., 2009).

$VO_{2\ max}$ is known to be the golden standard when assessing cardio respiratory fitness (Stickland et al., 2012), as $VO_{2\ max}$ is both important marker for health and performance (Eriksen et al., 2013 and Bassett and Howley, 2000).

Guyton and Hall (2006) stated that iron is an element essential for hemoglobin and enzymes as cytochrome oxidase, catalase. They added that the storage, transport and also the metabolism of iron occurred in the body. Iron is absorbed from intestine to the blood and combined with globulin to form transferrin. In the cytoplasm of the cell iron combined to apoferritin to form ferritin.

So, to get rid of the iron deficiency remarked among some female university students, after blood tested in the laboratory, it was decided to overcome the problem by dietary supplementation to supplement the diet with ferrotron or traditional iron salts.

It is known that the dates contained iron element and analysis of drinking water turned out to contain the element triangular.

The purpose of the study was to investigate the effect of dietary supplement "ferrotron", and traditional iron salts, together with physical activity efficiency on anemic female students.

The study hypothesis

It is hypothzed that ferrotron, traditional iron salts together with physical activity can efficiently help curing anemic female students.

Research procedures

Research method: the researchers used the experimental method of (pre-post) measurements of four experimental groups, due to suitability of the nature of the study.

Research sample (40) of anemic female students from study from the students of faculties of Assiut University branch of the new valley except for the Faculty of Physical Education. All of them are residents of the university city of Al-Kharga students in the New Valley Governorate, they were divided into four equal groups, ten each, 1st group ingested "ferrotron" with exercise, 2nd group ingested "ferrotron without exercise", 3rd group supplemented with traditional iron salts with exercise, 4th group supplemented with traditional iron salts without exercise.

There are non-statistically significant differences between the groups.

Table (1): iron daily requirements for humans

Age/sex	mg/day[b]
4-12 months	0.96
13-24 months	0.61
2-5 years	0.70
6-11 years	1.17
12-16 years (girls)	2.02
12-16 years (boys)	1.82
Adult males	
Pregnant women[c]	1.14
First trimester	0.8
Second and third trimester	6.3
Lactating women	1.31
Menstruating women	2.38
Postmenopausal women	0.96

[a] Absorbed iron is the fraction that passes from the gastrointestinal tract into the body for further use. [b] Calculated on the basis of median weight for age. [c] Requirements during pregnancy depend on the woman's iron status prior to pregnancy

Data collection tools:

- Height by using restameter.
- Weight by using medical scale.
- Physical fitness VO_2 using the Harvard step test using platform (step) 50.8 cm high, stop watch, metronome.
- Heart rate determined by pulse meter.
- Fitness index by equation = (10*test duration/S.)/(2*sum of heart rate) in recovery period.
- Hemoglobin determination using cyanomet-hemoglobin method using kits and spectrophotometer at 540nm wave length after Rajurkar et al. (2012).
- Iron determination using method (RIA).
- Ferritin determination using method (RIA).
- O_2 determination using method (gas analyzer).
- 5 ml venous blood was withdrawn before and after the experiment from all participants for determination of the physiological variables.
- Blood samples were withdrawn by a specialist, laboratory measurements were conducted in special lab.

Pilot study

- (3) Female students were the participants of the pilot study.
- They were from the same group chosen for the study for a period of (3) days before the main study (15/1/2017), the reason to perform the pilot study is to:
  - Investigate the equipment and tools.
  - To know the problem that might face the study.
  - Determine the best way to perform measurements and record data.

Table (2): Homogeneity and equivalence of the samples

Samples	Sports practitioner + ferrotron			Non-sports practitioner + ferrotron			Sports practitioner + traditional iron salts			Non-sports practitioner + iron tablet		
	Age (Year)	Weight (kg)	Height (cm)	Age (Year)	Weight (kg)	Height (cm)	Age (Year)	Weight (kg)	Height (cm)	Age (Year)	Weight (kg)	Height (cm)
1	18	89	174	18	55	152	18	52	165	19	62	167
2	18	62	171	18	42	154	19	54	164	18	60	166
3	19	57	173	18	59	155	18	55	161	19	61	165
4	18	52	168	19	47	165	19	56	160	18	62	161
5	19	55	166	19	47	165	18	52	158	18	63	163
6	18	56	170	18	50	160	18	53	159	18	65	159
7	18	62	161	19	52	163	18	52	157	19	66	158
8	19	60	165	18	55	164	18	53	160	18	63	164
9	18	61	166	19	52	162	19	55	161	18	62	161
10	19	60	165	18	53	160	18	57	162	19	61	160

The main study:

Pre-measurement occur on 1/2/2017.

The proposed training program:

- The application program was applied for 12 weeks.
- Training units 3 unit/week.
- The member of units 36 units.
- Training unit time 30-45 minutes.
- Intensity of loads begin below the average in the first two units, progress to the average for the rest unit.
- Rest interval for 1-2 minutes.
- The training load increased gradually by 5% of the maximum.
- Administration doses were:
  - Ferrotron……..
  - traditional iron salts……..
- Post measurements occur on 2/5/2017.

Results and Discussion

Results indicated in Table (2) not significant differences in the basic characteristic features of the four groups participating in the study in age, weight and height.

As for the different variables before consuming ferrotron and traditional iron salts, there was also no significant differences as indicated in Tables (3), for the variables of the study namely, hemoglobin, iron, ferritin, O_2, pulse rate and VO_{2max}, indicating the homogeneity in different variables before consuming ferrotron and iron and before sport partitioning or non partitioning of sport.

Table (3): Shows the measurement of hemoglobin, oxygen, pulse and oxygen consumed for the first and second summers before taking the ferrotron and at the end of the period of taking ferrotron for the sports practitioner and non-sports practitioner

Samples	Sports Practitioner+ferrotron												Non-practitioner of sport + ferrotron											
	Hb (mg/dl)		Iron (Ug/100ml)		Ferritin (ug/100ml)		O2		Pulse		Vo2		Hb (mg/dl)		Iron (Ug/100ml)		Ferritin (ug/100ml)		O2		Pulse		Vo2	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
1	5.20	12.80	35.66	79.34	8.55	35.10	97.00	98.00	80.00	72.00	60.20	80.00	5.14	11.90	33.00	70.23	8.17	28.00	97.00	97.00	78.00	74.00	52.00	68.10
2	5.50	13.00	37.70	85.12	9.00	39.24	98.00	98.00	87.00	74.00	62.00	86.00	5.35	12.00	36.30	79.00	9.54	35.87	97.00	98.00	79.00	75.00	58.00	69.20
3	5.65	13.00	40.00	88.00	9.56	43.00	98.00	99.00	89.00	74.00	64.00	87.00	5.70	12.15	40.18	84.10	9.65	37.52	98.00	98.00	85.00	80.00	62.10	72.00
4	5.60	13.00	39.90	87.90	9.15	42.20	98.00	99.00	87.00	74.00	63.00	87.00	5.65	12.10	38.81	80.70	9.55	36.77	97.00	98.00	79.00	75.00	60.20	70.00
5	5.20	12.70	35.00	77.54	8.50	29.80	97.00	98.00	75.00	71.00	55.00	70.00	5.13	11.90	33.00	69.27	8.15	22.89	97.00	97.00	78.00	75.00	50.00	68.00
6	5.38	12.80	37.00	84.10	9.00	36.70	98.00	98.00	81.00	73.00	61.00	86.00	5.22	12.00	34.00	75.00	9.24	34.00	97.00	98.00	79.00	75.00	57.00	69.00
7	5.00	12.00	30.54	67.98	8.10	29.15	97.00	97.00	71.00	68.00	45.00	67.00	5.10	11.38	31.15	67.43	7.81	20.90	96.00	97.00	73.00	70.00	43.00	66.00
8	5.00	12.00	30.00	65.90	7.94	28.65	97.00	98.00	70.00	67.00	44.20	65.00	5.00	11.00	30.20	63.00	7.12	18.38	95.00	97.00	67.00	67.00	42.00	65.00
9	5.70	13.00	45.50	90.46	10.77	45.00	98.00	99.00	89.00	77.00	64.20	88.00	5.77	12.45	40.98	84.76	10.00	38.00	98.00	99.00	87.00	80.00	63.00	76.00
10	5.10	12.50	38.14	75.23	8.16	29.55	97.00	98.00	71.00	69.00	46.80	68.00	5.10	11.85	32.15	67.80	8.00	21.34	96.00	97.00	78.00	75.00	44.00	67.00
Average	5.33	12.68	36.14	80.16	8.87	35.84	97.50	98.20	80.00	71.90	56.54	78.40	5.32	11.87	34.98	74.13	8.72	29.37	96.80	97.60	78.30	74.60	53.13	69.03

In case of the data of the study for consuming ferrotron or traditional iron salts in case of sports practitioner or non-practitioner of sports, data revealed that following:

Pulse rate at rest was recorded before ferrotron and iron supplementation and after in sport practitioners and non-sport practitioners (Table 3) indicated a lower resting pulse rate in the four groups of the study, ferrotron supplementation in case of sports practitioners female students revealed the least resting pulse rate among other groups. The pulse rate as is well known; is the number of time represented by the heart beat and palpated in super ficial arteries in one minute, and the lower the heart rate palpated at rest, the soundness of the heart indicated. It is reported by many researches that heart rate (pulse rate) and VO_{2max} are the best indicators of fitness and performance. Athletes heart rates is lower compared by non-athlete, the possible cause of the lower level of the heart rate in athlete compared to non-athlete is due to the effect of parasympathetic nervous system leading to lower heart rate and increase stroke volume.

For this reason, it is frequently stated that the level of athletic performance that can be achieved, mainly depends on the performance capacity of his or her heart, because this is the most limiting link in the delivery of adequate oxygen to the exercising muscles, therefore, the greater cardiac output achieved by athletes over non-athletes is probably the important benefit of the training program (Scherman,2002 and Tanaka and Seals,2003).

The results of hemoglobin concentrations in case of sport practitioner + ferrotron (Table 5) hemoglobin concentration increase after the practitioner of sport and ferrotron from 5.33±0.35 to 12.68±0.33 g/dl, these results overcome hemoglobin concentration of non-practitioner of sport +ferrotron which was 5.32±0.4 to 11.87±0.41 g/dl.

Hemoglobin concentration also increased in case of sports practitioner + traditional iron salts compared with non-sports practitioner +traditional iron salts as indicated in Table (4).

The consumption of ferrotron elevated the hemoglobin concentration compared to the traditional iron salts consumption in the different groups.

The results of the study indicated the positive effect of both the ferrotron and sport in increasing hemoglobin concentrations which may be caused by the suitability of iron in case of ferrotron to increase hemoglobin concentration found in heme, also due to the effect of sport in increasing the protein part of the hemoglobin concentration, which in globin. Compared to the use of traditional iron salts in sport and non-sport practitioners.

These results were in accordance with that of (Blair et al., 2004 and Booth et al., 2002), they reported that exercise may increase muscle mass together with growth hormone, the hormone may increase muscle fibers and protein including globin of the hemoglobin, as for the ferrotron administration may help in increasing iron concentration in the heme; that means sports + ferrotron increased heme and globin which are main constituents of the hemoglobin as for O_2 concentration and VO_{2max} (Table 5), data indicated that athletic activity together with ferrotron ingestion and traditional iron salts revealed a significant increased consumption of O_2 and VO_{2max}in all the four groups, with an extra increase values after ferrotron and sport practitioners.

The increase of O_2 and VO_{2max} reported in this study, may be due to the increased hemoglobin concentration which improved oxygen consumption to the active skeletal muscles and the other organs and systems of the body; as athletic activities increase blood flow to the active parts of the body together with increased iron concentration reported in this study, meaning that sport and supplementation are the main factors leading to an increased O_2 and VO_{2max} and fitness of the practitioners of the study.

These results are in agreement with those of (Tschakovski and Hughson, 2004 and Fox, 1979).

The researches added that oxygen diffusing capacities, that the amount of oxygen that diffuses through the respiratory membrane each minute which is equal to diffusing capacities increased from non-athlete at rest (23ml/min.) to more than double in non-athlete during maximal exercise, as for athlete, it is reported also, that there is another increase in diffusing capacities originated from the adaptation of blood vessels which led to the process of angiogenesis as a result of adaption, by angiogenesis, it is meant that blood vessels increased in volume and divisions.

Data of Table (4) also indicated an elevation of iron and ferritin concentrations after physical activity and ferrotron ingestion and after iron Tablets administration, this indicated that both sport and iron supplement may induced a positive effect on anemic subjects.

Table (4) shows the measurement of the hemoglobin, oxygen, pulse and oxygen consumed for the third and fourth groups before taking the iron and at the end of the period of taking the iron for the sports practitioner and non-sports practitioner

Samples	Sports Practitioner + Iron Disks												Non-Practitioner + Iron Disks											
	Hb (mg/dl)		Iron (Ug/100ml)		Ferritin (ug/100ml)		O2		Pulse		Vo2		Hb (mg/dl)		Iron (Ug/100ml)		Ferritin (ug/100ml)		O2		Pulse		Vo2	
	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before
1	5.38	10.40	36.90	80.10	9.00	36.70	92.00	95.00	85.00	76.00	56.00	67.00	5.20	10.00	34.00	72.00	9.00	20.89	92.00	92.00	81.00	81.00	57.00	57.00
2	5.00	10.00	30.10	65.00	7.94	28.65	83.00	90.00	85.00	75.00	42.20	62.00	5.00	9.00	29.20	50.00	7.20	15.38	83.00	83.00	72.00	72.00	42.00	42.00
3	5.15	10.20	32.00	78.54	8.50	29.80	91.00	93.00	75.00	77.00	43.00	65.00	5.12	9.40	33.10	60.90	8.00	18.40	91.00	91.00	80.00	79.00	45.00	45.00
4	5.75	11.10	43.00	82.46	10.77	45.00	95.00	96.00	75.00	80.00	64.20	70.00	5.90	10.40	40.90	77.83	10.10	28.60	95.00	95.00	82.00	82.00	62.00	62.10
5	5.10	10.00	30.10	66.98	8.10	29.15	85.00	91.00	87.00	75.00	42.00	63.00	5.00	9.22	30.15	55.10	7.64	17.50	85.00	85.00	75.00	75.00	43.00	43.00
6	5.65	11.00	42.67	81.00	9.56	43.00	95.00	96.00	87.00	77.00	63.00	70.00	5.80	10.34	38.90	76.00	9.65	28.00	94.00	94.00	82.00	82.00	61.00	61.00
7	5.20	10.34	34.00	79.74	8.55	35.10	91.00	94.00	77.00	80.00	54.00	67.00	5.14	9.80	33.40	69.70	8.30	23.10	91.00	91.00	80.00	80.00	52.00	52.00
8	5.12	10.10	30.43	75.73	8.16	29.55	90.00	91.00	86.00	77.00	42.80	64.00	5.10	9.45	32.85	57.90	7.90	18.00	90.00	90.00	76.00	76.00	43.00	43.20
9	5.62	10.90	40.20	80.90	9.15	42.20	95.00	95.00	80.00	75.00	60.20	69.00	5.51	10.10	36.30	75.40	9.45	25.70	94.00	94.00	81.00	81.00	60.20	60.00
10	5.40	10.80	37.00	80.90	9.00	39.24	92.00	95.00	84.00	78.00	57.00	68.00	4.40	10.00	35.30	73.10	9.20	22.00	92.00	93.00	81.00	81.00	59.00	59.00
Average	5.34	10.48	35.64	77.14	8.87	35.84	90.90	93.60	82.10	77.00	52.44	66.50	5.22	9.77	34.41	66.81	8.62	21.40	90.70	90.90	79.00	78.90	52.42	52.43

Chatterjea and Shinde (2005) stated that iron is one of the most essential trace elements in the body and its decreased concentration might induce anemia. Also, essential or functional iron is very important for the metabolism of the body and is the active element for formation of the heme of hemoglobin, myoglobin

and that of the catalase enzyme. They also added that exercise and iron supplementation are the main causes together with dietary iron to increase blood iron and may be used to cure anemia. Also, the higher the iron concentration, the higher the amount of iron the tissues can absorb and incorporate in the proteins they synthesize. Thus, a high iron concentration within normal in desirable.

Table (5): Measurement of height, age, weight, hemoglobin, oxygen, pulse and oxygen consumed for four groups after the statistical analysis of the results

Samples	Age	Weight	Height	Hb (mg/dl)		Iron (Ug/100ml)		Ferritin (ug/100ml)		O_2		Pulse		VO_2	
				Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Sports Practitioner+ferrotron	18.4± 0.516	61.4± 10.243[a]	167.9± 4.067[a]	5.33± 0.356	12.68±0.33a	36.14±5.01	80.16± 8.5a	8.87± 0.84	35.34±6.33a	97.5± 0.59	98.2± 0.63a	80± 7.8b	71.9± 3.14c	56.54±8.17	80.40± 9.69a
Non-practitioner of sport + ferrotron	18.4± 0.483	51.2± 4.894[b]	160± 4.760[b]	5.32± 0.4	11.87±0.41b	34.98±3.85	74.13±7.66ab	8.92± 0.98	29.37±7.89b	96.8± 0.91	97.6± 0.69a	78.3± 5.55bc	74.6± 3.92ab	53.13±8.07	69.03± 3.15bc
Sports Practitioner + Iron Disks[a]	18.3± 0.516	53.9± 1.791[b]	160.7± 2.496[b]	5.34± 0.351	10.48±0.33c	35.64±5.08	77.14±6.16a	8.87± 0.84	35.84±6.33a	90.9± 4.09	93.6± 2.22b	82.1± 4.88a	77± 1.88a	52.44±9.7	66.5± 2.87c
Non-Practitioner + Iron Disks	18.4± 0.516	62.5± 1.840[a]	162.4± 3.062[b]	5.22± 0.4	9.77± 0.47d	34.41±3.61	66.81±9.95b	8.62± 0.97	21.4± 4.58c	90.7± 3.88	90.80±3.93b	79± 3.43c	78.9± 3.43a	52.42±8.37	52.43± 8.34d
LSD	Not sig.	5.314	3.38	N.S	0.391	N.S	7.47	N.S	5.84	N.S	2.62	2.1	2.9	N.S	2.87

Murray et al. (2009) reported also that people can achieve a high iron concentration within reference interval by eating food rich in iron, also iron concentrations are high in athletes, they added that ferritin is the iron storing protein, found mainly in the spleen, bone marrow and liver. Its quantity in the body relates positively to that of iron, it increase through food rich in iron, supplement and exercises.

Carnethon et al. (2005) reported that VO_{2max} is an important health marker, as it is also a fitness marker and together fitness and health are needed for performance.

Peterson and Bryant (1995) reported that as exercise principles move from the athletic realm to the medical setting, it is important not only to have a good working knowledge of many conditioning program, but also to be able to apply them to situations other than athletic population. To have a better life, one must adopted a physical active life style, based upon training for fitness and sound diet for health and it is important to say that exercise have a preventative role in health care (Howley and Franks, 1992).

Table (5) indicated that ferrotron induced an improvement in all parameters tested over iron (hemoglobin, O_2, VO_{2max}, pulse rate and ferritin).

The overriding effect of ferrotron over traditional iron salts, may be caused due to the complex additives found in case of ferrotron compared to traditional iron salts; which are iron, Vit C, Zinc, Biotin, Vit (B_1, B_2, B_6 and B_{12}) as shown in Table (6), they all act as antioxidants and co-enzymes, all together increase the absorption of iron from ferrotron in the digestive system, which in turn induced a rapid effect in curing anemia, through the rapid formation of hemoglobin and increase iron concentration and ferritin. These variables also help in increasing O_2 transport to active muscles inducing higher fitness and physical performance.

Table (5) also revealed that sports practitioners results in iron, ferritin, hemoglobin together with O_2 and VO_{2max} were highly improved compared to non-sport practitioners, which indicated that athletes run a lower risk for anemia caused by iron deficiency. The reason may be that exercise does not increase iron loss through sweat as it is negligible and most athletes replenish iron loss while eating more food to meet their increased energy demands. This is also in agreement with the studies of Shashley and Green (2000) and Weight (1993).

From the preceded discussion, it might indicated that the study by hypothesis is realized.

Table (6) Ferrotron capsule composition

Iron	15 mg
Zinc	11 mg
Copper	0.9 mg
Molybdenum	45 Ug
Vitamin B1	1.2 mg
Vitamin B2	1.3 mg
Vitamin B6	1.7 mg
Vitamin B12	2 Ug
Folic Acid	400 Ug
Biotin	30 Ug
Vitamin C	90 mg

Conclusion

Ferrotron or iron supplementation together with physical activity can affect efficiency anemic female students, with the higher score related to ferrotron supplementation.

It is recommended to use ferrotron supplement together with sport anemic cure.

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