A Study of the Correlation Between Dyslipidemia and Iron Deficiency Anemia in Egyptian Adult Subjects

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ABSTRACT

Background: Both iron deficiency anemia (IDA) and dyslipidemia are widely prevalent public health problems, especially in the Egyptian population. So, the purpose of this research was to study the correlation between dyslipidemia and IDA in Egyptian adults, Minoufiya Governorate population. Methods: In this comparative cross-sectional study, 110 adult with confirmed IDA and 110 healthy controls, in the age group 18-55 years were investigated for any possible changes in serum lipid profile i.e., triglycerides (TG), total cholesterol (TC), high density lipoprotein cholesterol (HDL-c) and low density lipoprotein cholesterol (LDL-c) and very low density lipoprotein cholesterol (VLDL-c). Also, correlation between serum lipid profile and severity of anemia was also calculated. Results: The results are shown as mean± standard deviation. TG, TC, LDL-c and VLDL-c levels were found to be significantly (P <0.001) elevated in the IDA group (were 85.67±26.86, 123.79±30.54, 71.57±24.64 and 17.13±7.21 mg/dl) as compared to controls (107.89±22.40,158.45±26.34, 93.24±18.45 and 21.58±5.76 mg/dl). whereas level of HDL-c were found to be significantly (P <0.001) higher in patients (43.63±12.54 mg/dl) as compared to controls (35.09±13.05mg/dl). Correlation between lipid profile (TG, TC, and LDL) levels and severity of anemia (hemoglobin levels) showed positive and significant (P <0.01) values. Conclusion: These findings indicate that that the levels of serum lipid profile in Egyptian adults IDA were lower than the healthy control. However, to identify potential mechanisms of this relationship, further research are recommended to be carried out.

Keywords: Iron deficiency anemia, serum lipid profile, hemoglobin, ferritin, cholesterol, severity of anemia.

INTRODUCTION

Iron- deficiency anemia or what is called (IDA) is initially defined as a decrease in the amount of hemoglobin (Hb) or red blood cells (RBCs) in the blood (Wang *et al.,* 3013). The most prevalent type of anemia is IDA, which happens when the body does not have enough of the mineral iron to make haemoglobin. The rest of the body can't obtain the oxygen it needs if there isn't enough iron in the bloodstream. According to the World Health Organization (WHO), IDA is generally characterized by a level of Hb which is below 13.0 g/dL in male adults, and 12.0 g/dL in female adults who are not pregnant, and below 11.0 g/dL in pregnant women (WHO, 2011). As a result, a decrease in blood iron produces insufficient Hb synthesis and, as a result, a decrease in erythrocyte proliferation. In patients with IDA, there may also be a decline in red cell survival (Hafez *et al.,* 1986 and Cusick *et al.,* 2008). Accordingly, the most common causes of IDA might include inadequate iron intake due to a diet that doesn't provide the daily nutritional needs or that's heavily restricted; inflammatory bowel disease; increased iron requirements during pregnancy; or blood loss through heavy periods or internal bleeding (Elashiry *et al.,* 2014; Cappellini *et al.,* 2019 and Mehram *et al.,* 2021).

For these reasons, IDA is considered to be one of the major health problems. According to the WHO (2015) 1.62 billion individuals, or 24.8 percent of the world's population, suffer from anemia. Iron deficiency is responsible for roughly half of all anemia cases worldwide, and it kills over 841,000 people per year (Longo *et al*., 2011). Anemia and iron deficiency affect a large percentage of the population in various age groups, according to a study conducted by For example, in the United States, anemia affects almost 4.7 million people, and its incidence rises with age, with 44.4 % of people over 85 being anaemic (Brill and Baumgardner, 2000). In Egypt; however, anemia was a public health problem where the prevalence of it reached 40% (EDHS, 2005). In this line, Elashiry *et al.* (2014) noted that anemia by the third trimester of pregnancy is a major health problem, with personal, nutritional, and some components of outcome healthcare offered at this point all contributing to the risk. Also, Afaf *et al.* (2015) reported that among the 4526 households from eleven Egyptian governorates 18.5% of IDA was recognized as IDA with a high prevalence for mothers (25.1%). Furthermore, Al Ghwass *et al.* (2015) discovered that IDA is a serious public health issue in Egyptian children, particularly in rural areas, those from poor social classes, and those with low maternal educational levels.

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On the other hand, dyslipidemia refers to unhealthy levels of one or more kinds of lipid in the blood. Blood contains three main types of lipid including high-density lipoprotein (HDL), low-density lipoprotein (LDL), and triglycerides (TG). Most dyslipidemias are hyperlipidemias, that is, an elevation of lipids (LDL and/or TG) and reduction of HDL in the blood (Voet, D. and Voet, 1990 and Chou et al., 2016). Elevation of serum lipid levels, dyslipidemia, increases the risk of atherosclerosis and coronary heart disease (Yang *et al.*, 2015). Because of the role of dyslipidemia in atherogenesis, its effects on health increase with age, thus great attention is paid to dyslipidemia and its associated factors (Salonen *et al.*, 1992; Sotuneh *et al.*, 2014; Ashar et al., 2015). The number of papers published on lipid changes, or dyslipidemia, in IDA is relatively few. Furthermore, the findings of these investigations are inconclusive. Some of these studies demonstrate that lipid values in IDA patients are greater than in healthy controls, whereas others show that lipid parameters in IDA patients are lower (Ohira *et al.*, 1980; Choi *et al.*, 2001, and Jingqi *et al.*, 2020). They also showed that after iron replacement or transfusion, lipid markers in IDA patients improved to normal levels. Other epidemiological studies, on the other hand, have linked substantial iron reserves in the body to an increased risk of coronary heart disease, with dyslipidemia being the most relevant risk factor (Avila *et al.*, 2015 and Guglielmi et al., 2015). Moreover, Furthermore, Mahshid *et al.* (2017) found that the amount of lipid profile (triglyceride and cholesterol) in older adults with anemia and IDA was lower than in the general population. Although a link between IDA and dyslipidemia has been shown in animal models, this link has not been well investigated in people (Bristow-Craig *et al.*, 1994 and Ahmed *et al.*, 2012). The current study aims to evaluate the association between IDA and dyslipidemia in Egyptian adults because there have been few investigations on the influence of anemia on serum lipid profile.

MATERIAL AND METHODS

Materials

All chemicals, solvents and buffers, except stipulated, were in analytical grade and purchased from Al-Gomhoria Company for Trading Drugs, Chemicals and Medical Instruments.

Study protocol

The study was conducted from September 2019 to March 2020, in Health Units, Hospitals and Teaching Hospitals in Minoufiya Governorate, Egypt. The study protocol was approved by the Local Scientific Research Ethics Committee (SREC/HE/03/2019), Faculty of Home Economics, Minoufiya, Shebin El-Kom, Egypt. A total of 220 subjects aged 25 to 50 years who were seeking medical advice for mild acute complaints as upper respiratory tract infections, mild gastroenteritis or other complaints, were chosen in randomization and enrolled in the study.

Subjects with any history of smoking, disease of kidney, heart, liver or thyroid, diabetes mellitus, chronic infection/disease, hypertension, history of drug therapy, hematinic therapy especially during past on year, both long term and those affecting serum lipid level steroids, active bleeding, hematological disorder, recurrent jaundice, current pregnancy and passage of worms in stools, hospitalization or any surgical procedure performed within past three months, history of blood transfusion within 6 months before the study, and usage of supplemental vitamins were excluded from the study (Ann *et al.*, 2002; Bermejo and García-López , 2009).

The study methodology was explained to all of the participants, and their written agreement was collected. Online statistical calculator was used for sample size determination guided by power test of 80%, confidence level of 95%, and α error of 5%. The sample size was calculated to be 220 subjects. They were given particular days to take venous blood samples early in the morning after fasting the night before. The haematological and biochemical parameter reference values were derived from hospital laboratory data. All subjects had their complete hemogram, serum iron, serum ferritin, total iron binding capacity (TIBC), and mean corpuscular volume (MCV) measured. When haemoglobin (Hb), serum iron levels, and serum ferritin levels were lower below the predicted values for the selected group, the diagnosis of IDA was confirmed. Description criteria for IDA are microcytic hypochromic erythrocytes; with a mean corpuscular volume (MCV) <70 fL, red blood cell distribution width (RDW) $\geq 15\%$, hemoglobin concentration <11 g/dL, serum iron concentration <40 µg/dL, and serum ferritin concentration <10 µg/dL. A field pretested interviewing questionnaire was used for data collection which covering the following points: subject age, sex, residence (urban or rural) and family size. Sociodemographic status of subjects and their families and socioeconomic score, which contained social variables were calculated and classified such as mentioned by Fahmy and El-Sherbini (Fahmy and El-Sherbini, 1983).

Hematological analysis

Blood samples were withdrawn from the antecubital vein into glass centrifuge tubes containing oxalate solution (1.34%) as anticoagulant. After centrifugation at 1500 *Xg* for 10 minutes, plasma was withdrawn and used for analysis of serum lipid parameters (Singh *et al.*, 1991). Triglycerides (TG), Total cholesterol (TC) and

HDL-Cholesterol were determined in serum using specific kits purchased from El-Nasr Pharmaceutical Chemicals Company, Cairo, Egypt. Low density lipoprotein cholesterol (LDL-c) and very low density lipoprotein cholesterol (VLDL-c) were assayed according to the equations of Fniedewald *et al.*, (1972) *as* follow: Very low density lipoprotein (VLDL cholesterol) = TG/5 and LDL cholesterol = Total cholesterol – HDL cholesterol – V LDL cholesterol.

Serum iron (Fe) content samples were determined by the adaptation the method mentioned by Singh *et al.* (1991). Blood hemoglobin (Hb) concentration was determined using cyanmethemoglobin method according to Villanova (Villanova, 1994). The plasma ferritin concentrations value was assayed using specific Kits (Al-Gomhoria Company for Trading Drugs, Chemicals and Medical Instruments, Cairo, Egypt) according to the methods mentioned in Tietz (1999). The complete blood count was done using Coulter 1660 to determine the erythrocyte indices including mean corpuscular volume [MCV].

Statistical analysis

The Pearson method was used to determine the statistical analysis using the MINITAB-12 computer programme (Minitab Inc., State College, PA). The unpaired Student's '*t*' test was used to compare the control and IDA groups. The results were expressed as means ± standard deviation (SD). A *P* value of less than 0.05 was accepted as the statistical significance level.

RESULTS AND DISCUSSION

Sociodemographic characteristics and multivariate analysis of potential risk factors for IDA among studied group

Among 237 participants were included in the study, 17 (7.17%) participants were not analyzed because of unavailability of consent for study or inadequate sample. The remaining enrolled 220 subjects which include 110 cases and 110 controls, aged 25 to 55 years with a mean age of 42.34 ± 5.23 years. They were 105 (47.73%) males and 115 (52.27%) females. The sociodemographic data and multivariate analysis of potential risk factors for IDA among studied group are shown in Table (1). Based on the biochemical iron status, 110 subjects (50.00%) were anemic. Of 110 cases, 37 had hemoglobin <7 g%, 48 had hemoglobin between 7 and 10 g, and 25 had hemoglobin more than 10 g%. Based on the red cell indices, 58 had microcytic hypochromic anemia, 36 had normochromic anemia, 11 had dimorphic anemia, 4 had normocytic hypochromic anemia, 1 each had macrocytic anemia and pancytopenia. As shown in the same data, a logistic regression model was used to assess the effects of the significant explanatory variables in order to distinguish predictors of IDA. It was found that subjects from rural areas (77.00%), those from low social class (45.46%) and those of secondary mothers (30.91) were the significant risk factors for IDA in these subjects. In similar study carried out by Amany and Samaa (2012) and Mehram *et al.* (2021) found that multivariate analysis revealed that, low level of education, decreased birth spacing and history of anemia before pregnancy were associated with increased risk of anemia (p<0.05, OR = 18.821, 10.582 and 3.362 respectively). Also, Wu *et al.* (2002) reported that iron deficiency is responsible for lost productivity and premature death in adults and has been implicated as a cause of perinatal complications such as low birth weight and premature delivery in affected mothers (CDCP, 2008). The first signs and symptoms in youngsters can be mild and treatable. Increased vulnerability to infection and poor growth are two long-term effects of iron deficiency. Finally, Elhassaneen *et al.* (2016) found that patients from rural areas (68.12%), those from low social class (65.63%) and those of illiterate mothers (82.46) were the significant risk factors for IDA in Egypt.

Hematological and biochemical parameters of the groups

The hematological and biochemical parameters among control (normal cases) and IDA patients are shown in Table (2). From such data it could be noticed tha the mean hemoglobin (Hb) level and mean corpuscular volume (MCV) of control were 13.80±2.4 g/dL and 78.99±6.72 fL which significantly decreased by the rates of -48.77% (p≤0.001) and -24.41% (p≤0.01) in IDA patients, respectively. On the other side, iron profile among control (normal cases) and IDA patients indicated that the mean serum iron and serum ferritin levels of normal cases were 130.56±23.78 µg/dl and 78.56±18.54 µg/dl which significantly (p≤0.001) decreased by the rates of -68.42% and -90.52% (p≤0.001) in IDA patients, respectively. Such data are partially in accordance with that obtained by Elhassaneen *et al.* (2016) who studied the prevalence of IDA in Infants and Young Children of Port Said Governorate in Egypt. Such as mentioned by Ann *et al.* (2002) measurement of Hb is a more sensitive and direct test for anemia than others tests. MCV, the average volume of RBCs, is reported in automated analyses, but it also can be calculated as the ratio of hematocrit (Hct) to RBC count. It is useful for categorizing anemia as microcytic, normocytic, and macrocytic. Serum iron concentration can be measured directly and generally decreases as iron stores are depleted (Fairbanks, 1991). Serum iron, on the other hand, may not correctly reflect iron storage since it is impacted by a number of other factors, including infection, iron absorption from food, inflammation, and diurnal variation (Oski, 1993 and Ann *et al.*, 2002). Ferritin is a storage compound for iron, and serum ferritin levels normally correlate with total iron stores (Ann *et al.*, 2002). As iron stores are depleted, serum ferritin levels decline and are the earliest marker of ID. Additionally, Douglas and Etheresia (2014) reviewed that serum ferritin is an important inflammatory and chronic infection disease marker, as it is mainly a leakage product from damaged cells.

Table 1. Sociodemographic characteristics and multivariate analysis of potential risk factors for IDA among studied group

Variables	Studied children					Statistical analysis
	Total Number (220)	Normal		IDA		
		Number (110)	Percent age (%)	Number (110)	Percent age (%)	
Sex:						
– Male	105	54	45.45	51	46.36	*
– Female	115	56	54.55	59	53.64	
Residence:						
– Urban	80	47	42.73	33	30.00	p≤0.05
– Rural	140	63	57.27	77	70.00	
Age (years):						
– 18 - <20	42	20	18.18	22	20.00	
– 20 - <30	60	32	29.09	28	25.46	*
– 30 - <40	40	19	17.27	21	19.09	
– 40 - <50	36	19	17.27	17	15.45	
– >50	42	20	18.18	22	20.00	
Family size (person):						
– 1	46	22	20.00	24	21.82	
– 2	68	36	32.73	32	29.09	*
– 3	40	20	18.18	20	18.18	
– 4	36	18	16.36	18	16.36	
– >4	30	14	12.73	16	14.55	
Social class:						
– Low	92	42	38.18	50	45.46	p≤0.05
– Middle	84	44	40.00	40	36.36	
– High	44	24	21.82	20	18.18	
Level of mothers education:						
– Illiterate/can read and write	50	22	20.00	28	25.46	p≤0.05
– Primary/preparatory	54	25	22.73	29	26.36	
– Secondary school	65	31	28.18	34	30.91	
– University or higher	41	32	29.09	19	17.27	

* Non-significant ($P \leq 0.05$)

Table 2. Hematologic al parameters of control (No Anemia) and IDA patients

Parameters		Control (No anemia, n=110)	IDA (n=110)	Statistical analysis
Hb (g/dL)	Range	12.02 -15.98	6.25-9.21	p<0.001
	Mean ± SD	13.80±2.4	7.07±2.11	
	% of change	------	-48.77± 3.01	
MCV (fL)	Range	72.98-89.56	56.83-67.42	p<0.01
	Mean ± SD	78.99±6.72	59.71±5.42	
	% of change	------	-24.41±4.98	
Serum iron (µg/dL)	Range	97.94-149.72	29.97-52.89	p<0.001
	Mean ± SD	130.56±23.78	41.23±15.67	
	% of change	-----	-68.42±14.60	
Serum ferritin (µg/dL)	Range	60.52-112.21	6.97-9.10	p≤0.001
	Mean ± SD	78.56±18.54	7.45±2.94	
	% of change	------	-90.52±7.64	

Comparison of serum lipid profile between normal and IDA groups

The comparison of serum lipid profile between normal and IDA groups are shown in Table (3) and Figure (1). From such data it could be noticed that the mean TG, TC, LDL-c and VLDL-c in control are 107.89±22.40, 158.45±26.34, 93.24±18.45 and 21.58±5.76 mg/dL, and in IDA were 85.67±26.86, 123.79±30.54, 71.57±24.64 and 17.13±7.21 mg/dL, respectively. Mean HDL-c levels was 35.09±13.05 mg/dL in control group and 43.63±12.54 mg/dL in IDA group. The differences between two groups with regard to the all serum lipid profile fractions levels were statistically significant; all the values except HDL-c being lower in IDA group. Such data are in accordance partially with that observed by Chowta *et al.* (2017). Also, Choi *et al.* (2001) observed that no significant differences in serum lipid levels between cases with moderate IDA and normal controls (healthy). They also found that serum TC and TG level were significantly lower in severely anemic subjects (Hb <8.0 g/dL) compared to normal controls which return to normal following iron supplementation. Furthermore, in the severely anemic subjects, blood hemoglobin concentration was positively correlated with serum TC and TG levels (Ece *et al.*, 1999; Sandeep *et al.*, 2014). On the other side, some studies were reported data in contrast to our findings. For example, Yang *et al*. (2015) showed higher levels of TG and lower HDL-c levels in the IDA women. In addition, Antappanavar *et al.* (2014) found that in cases with IDA, TG and VLDL-c levels were significantly higher than in normal controls, although LDL-c levels were significantly lower. Furthermore, Jingqi *et al.* (2020) discovered that genetically predicted greater blood iron levels are linked to a lower risk of IDA, lipid metabolism

disorders, and its two subtypes, hyperlipidemia and hypercholesterolemia. They are consistently linked to decreased TC and LDL-c levels in the blood. All of the available evidence suggests that iron deficiency has an influence on the lipid and lipoprotein profile. Other factors, in addition to iron deficiency, may play a role in such a problem. A diet lacking in iron, for example, may also be lacking in calories and protein. As a result, a hypocaloric diet may result in hypolipidemia (Aydin *et al.*, 1999). Also, Morrison *et al.* (1980) discovered that plasma LDL-C was adversely connected with the dietary polyunsaturated fatty acids (PUFA)/saturated fatty acids (SFA) ratio, and that TC and LDL-C were negatively correlated with dietary carbohydrate. Furthermore, Gonzales-Requejo *et al.* (1995) discovered that high total fat consumption was linked to an increase in serum levels of TC, LDL-C, and HDL-C. The altering lipid profile in children with IDA could be due to a variety of macronutrient intakes. Additionally, Mensink and Katan (1989) discovered that high MUFA consumption as a percentage of total fat intake is linked to reduced TC and LDL-C levels.

Table 3. Comparison of serum lipid profile between normal and IDA groups

Parameters		Normal group (n=110)	IDA group (n=110)	Statistical analysis
TG (mg/dL)	Range	92.56-135.67	59.67-110.54	
	Mean ± SD	107.89±22.40	85.67±26.86	p≤0.001
	% of change	0.00	-20.60±4.67	
TC (mg/dL)	Range	120.67-181.65	98.56-160.43	
	Mean ± SD	158.45±26.34	123.79±30.54	p≤0.001
	% of change	0.00	-21.87±3.07	
HDL-c (mg/dL)	Range	24.87-46.90	37.11-57.28	
	Mean ± SD	35.09±13.05	43.63±12.54	p≤0.001
	% of change	0.00	24.34±4.12	
LDL-c (mg/dL)	Range	70.10-100.54	42.67-93.20	
	Mean ± SD	93.24±18.45	71.57±24.64	p≤0.001
	% of change	0.00	-23.25±6.03	
VLDL-c (mg/dL)	Range	17.89-27.67	12.65-26.44	
	Mean ± SD	21.58±5.76	17.13±7.21	p≤0.001
	% of change	0.00	-20.60±2.17	

TG, triglycerides; TC, total cholesterol; HDL-c, high density lipoprotein cholesterol; LDL-c, low density lipoprotein cholesterol and VLDL-c, very low density lipoprotein cholesterolncv.

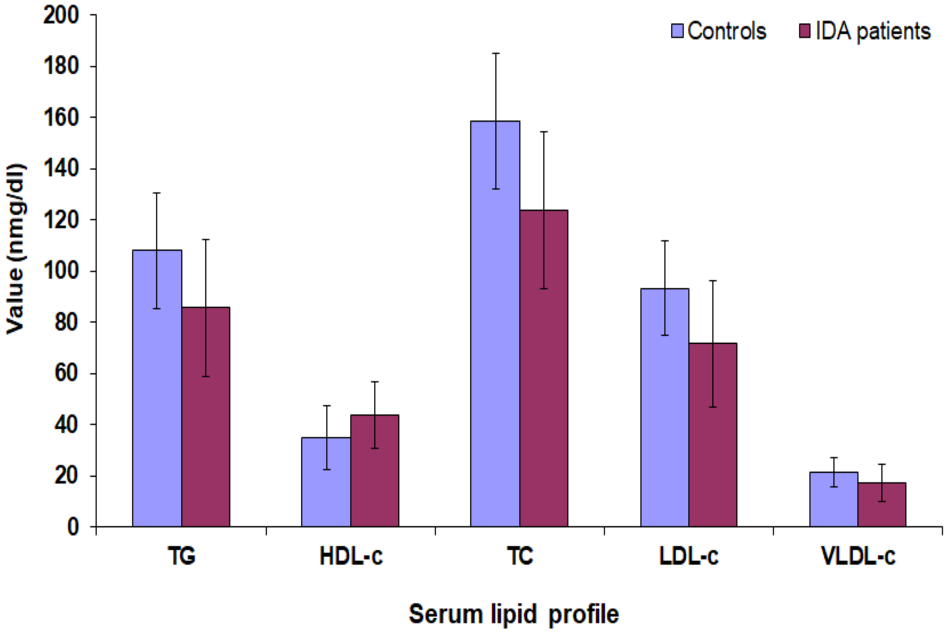

Fig. 1. Serum lipid profile in normal and IDA groups

TG, triglycerides; TC, total cholesterol; HDL-c, high density lipoprotein cholesterol; LDL-c, low density lipoprotein cholesterol; VLDL-c, very low density lipoprotein cholesterol

Correlation between lipid profile and different grades of anemia

Correlation between lipid profile and severity of anemia of studied cases was shown in Table (4) and Figure (2)**.** The comparison of lipid profile values among IDA with different grades of anemia showed statistical significance for TG, TC, and LDL, the values being positively correlating with levels of hemoglobin. Thus, as the severity of anemia increased, there was a proportionate decrease in the lipoprotein values which suggesting that the association of anemia with hypocholesterolemia. Such date are in accordance with that reported by Choi *et al*. (2001) who found that serum TC level is positively correlated with the hemoglobin levels in IDA group. Also, Ali *et al.* (2007) reported that in premenopausal women both low iron states and anemia itself may play protective roles for atherosclerotic heart diseases via improved lipid metabolism. Such phenomena, positively correlation between serum lipid profile and levels of hemoglobin, could be interpreted by one or more of the following mechanisms: 1), the concentration of red blood cells may affect cholesterol synthesis or mobilization from tissue to plasma (Ohira *et al.*,1980). It has been reported that the activity of some enzymes such as thyroid peroxidase decrease in iron deficient states which might also decrease the activity of enzymes contributing to cholesterol synthesis (Hess *et al.*, 2002), 2) Iron plays a role in hepatic lipogenesis (Voet and Voet, 1990). Because iron is a key component of various lipid-metabolizing enzymes and transporters, it may have a direct impact on hepatic lipid metabolism, 3) Iron in its ferrous form can generate free radicals, leading to oxidative stress and lipid peroxidation (Ahmed *et al.*, 2012), and 4) Finally, increasing hepatic iron stores resulted in overexpression of multiple enzymes, including the rate-limiting enzyme in cholesterol production, which boosted liver cholesterol synthesis and levels (Graham *et al.*, 2010).

Table 4. Correlation between lipid profile and different grades of anemia

Parameters		Hemoglobin level (g/dL)		
		<7 (n=37)	7–10 (n=48)	>10 (n=25)
TG (mg/dL)	Range	48.89–106.89	65.78–112.76	75.67–98.41
	Mean ± SD	74.54±28.16 [b]	92.13±24.11 [a]	90.54±10.98 [a]
TC (mg/dL)	Range	81.67–137.67	98.76–140.45	115.23–140.26
	Mean ± SD	103.43±27.63 [b]	124.19±20.65 [a]	129.46±16.56 [a]
HDL–c (mg/dL)	Range	24.24–50.20	33.67–51.26	20.56–42.87
	Mean ± SD	37.56±15.32 [a]	34.87±16.32 [a]	36.50±12.56 [a]
LDL–c (mg/dL)	Range	44.76–70.98	55.67–80.11	63.78–76.56
	Mean ± SD	53.96±24.90 [b]	67.89±16.98 [a]	74.85±15.78 [a]
VLDL–c (mg/dL)	Range	8.45–23.56	11.67–21.67	12.67–24.10
	Mean ± SD	14.91±8.11 [a]	18.43±5.98 [a]	18.11±7.40 [a]

TG, triglycerides; TC, total cholesterol; HDL-c, high density lipoprotein cholesterol; LDL-c, low density lipoprotein cholesterol and VLDL-c, very low density lipoprotein cholesterol

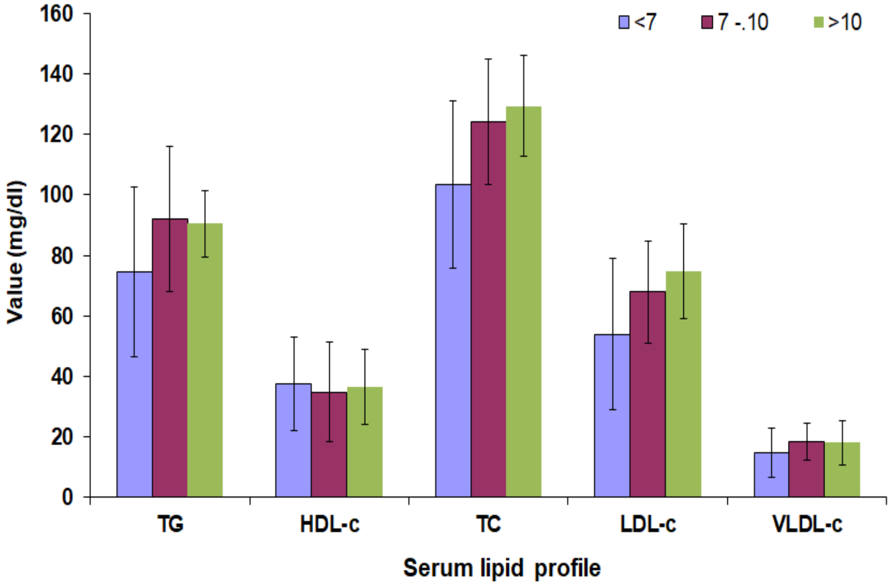

Fig. 2. Serum lipid profile and different grades of anemia

TG, triglycerides; TC, total cholesterol; HDL-c, high density lipoprotein cholesterol; LDL-c, low density lipoprotein cholesterol and VLDL-c, very low density lipoprotein cholesterol

CONCLUSION

The results of the present study showed that the values of serum lipid profile including triglyceride, cholesterol, high density lipoprotein and low density lipoprotein in Egyptian adults iron deficiency anemia were lower than the control, which is consistent with the findings of some other previous studies. However, to identify potential mechanisms of this relationship, further studies are recommended to be carried out.

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COMPETING INTERESTS

The authors declare that they have no competing interests.

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الملخص العربي

دراسة العلاقة بين الخلل الحادث فى دهون الدم وانيميا نقص الحديد لدى الأشخاص البالغين فى مصر

مي عبد الخالق غريب ، ناهد شحاتة عبد العال ، يوسف عبد العزيز الحسانين

يعتبر كل من فقر الدم الناجم عن انيميا نقص الحديد (IDA)والخلل الحادث فى دهون الدم من مشكلات الصحة العامة السائدة على نطاق واسع فى مختلف انحاء العالم بما فى ذلك مصر. لذلك، كان الغرض من هذا البحث هو دراسة العلاقة بين الخلل الحادث فى دهون الدم وانيميا نقص الحديد لدى الأشخاص البالغين فى محافظة المنوفية بجمهورية مصر العربية. الطريقة: في هذه الدراسة المقارنة المستعرضة، تم فحص عدد ١١٠ من الاشخاص البالغين لديهم انيميا نقص الحديد، وعدد ١١٠ من الاشخاص البالغين الاصحاء (كعينة ضابطة) ،جميعهم في الفئة العمرية ١٨- ٥٥ عامًا، وذلك لمعرفة أي تغييرات محتملة في صورة دهون الدم والتى تشمل الدهون الثلاثية (TG) ، والكوليسترول الكلي (TC) ، كوليسترول البروتين الدهني عالي الكثافة (HDL-c) وكوليسترول البروتين الدهني منخفض الكثافة (LDL-c) وكوليسترول البروتين الدهني العالى منخفض الكثافة (VLDL-c)، كما تم حساب الارتباط بين مستوى الدهون في الدم وشدة فقر الدم. النتائج: أظهرت النتائج ان مستويات TGو TC و LDL-c و VLDL-c كانت مرتفعة بشكل ملحوظ (P ≤0.001) في مجموعة انيميا نقص الحديد والتى سجلت قيما مقدارها ٨٥,٦٧ ± ٢٦,٨٦ و ١٢٣,٧٩ ± ٣٠,٥٤ و ٧١,٥٧ ± ٢٤,٦٤ و ١٧,١٣ ± ٧,٢١ مجم / ديسيلتر بالمقارنة بالقيم المناظرة لدى الاشخاص فى العينة الضابطة (الأصحاء) والتى سجلت ١٠٧,٨٩± ٢٢,٤٠،١٥٨,٤٥ ± ٢٦,٣٤ ، ٩٣,٢٤ ± ١٨,٤٥ و ٢١,٥٨ ± ٥,٧٦ مجم / ديسيلتر. بينما وجد أن مستوى HDL-cكانت اعلى بشكل ملحوظ (P <0.001) في المرضى (٤٣,٦٣ ± ١٢,٥٤ مجم / ديسيلتر) مقارنة بالعينة الضابطة (٣٥,٠٩ ± ١٣,٠٥ مجم / ديسيلتر). كما أظهر الارتباط بين مستويات الدهون فى الدم TG ، TC، LDL وشدة فقر الدم (مستويات الهيموجلوبين) قيم موجبة ومعنوية (P ≤0.01). الخلاصة: تشير هذه النتائج إلى أن مستويات الدهون في الدم لدى الأشخاص البالغين فى مصر والمصابين بأنيميا نقص الحيد كانت أقل من نظيراتها لدى الاشخاص الأصحاء (العينة الضابطة). ومع ذلك ، لتحديد الآليات المحتملة لهذه العلاقة فإنه يوصى بإجراء المزيد من الدراسات على هذا الموضوع فى المستقبل.

الكلمات المفتاحية: انيميا نقص الحديد ، نسبة الدهون في الدم ، الهيموجلوبين ، الفيريتين ، الكوليسترول ، انيميا نقص الحديد الحادة.