

Weak Relation between Increase of Lipid Levels and Blood Sugar Levels in Diabetic Patients

Dear Editor,

Diabetes mellitus (DM) can be defined as a metabolic disorder resulting from a defect in pancreas which produces insulin or its cells that do not respond to the production of insulin. DM patients suffer from high levels of blood glucose (hyperglycemia).^[1]

Hyperglycemia is the condition characterized by an increasing blood sugar glucose concentration above the normal value which ranges from 70 mg/100 ml to 120 mg/100 ml. Insulin is a hormone secreted from beta-cells in the pancreas and plays an important role in the regulation process of glucose levels in the bloodstream.^[2]

Type 1 DM is also known as insulin-dependent DM (IDDM) or juvenile diabetes,^[3] traditionally called juvenile diabetes because the majority of the cases of diabetes were diagnosed in children. This type of diabetes is characterized by the destruction of the insulin-producing beta-cells in the islets of Langerhans in the pancreas, which subsequently leads to insulin deficiency.^[4]

Type 2 DM is also known as non-IDDM and may be termed as adult-onset diabetes. The primary reason is high body weight and not enough exercise.^[5] It begins with insulin resistance, a condition in which the cells fail to respond to insulin properly. With the progression of the disease, lack of insulin may also develop. This type of diabetes is mainly due to lifestyle factors and genetics; a number of lifestyle factors are known to be important for the development of Type 2 DM, including obesity, lack of physical activity, poor diet, stress, and urbanization.^[6]

Triglyceride (TG, triacylglycerol, TAG, or triacylglyceride) is an ester derived from glycerol and three fatty acids. This type of blood lipid helps to enable the bidirectional transference of adipose fat and blood glucose from the liver.

Cholesterol is an organic molecule which is a sterol (or modified steroid), and an essential structural component of animal cell membranes is required to establish proper membrane permeability and fluidity. Cholesterol is thus considered within the class of molecules. Furthermore, cholesterol also serves as a precursor for the biosynthesis of steroid hormones, bile acids, and Vitamin D. Cholesterol is the principle sterol synthesized by animals. In vertebrates, the liver typically produces great amount than other cells. It is almost completely absent among prokaryotes (i.e., bacteria), although there are some exceptions such as mycoplasma, which require cholesterol for growth.

This study was carried out in Alexandria Puplic Hospital, Babylon, Iraq, during the period from July 2015 to October

2015. Fifty-four cases were collected, 30 female patients and 24 male patients suffering from DM, and their age ranged from 25 years to 65 years. Venous blood sample (5 mL) was collected from each patient and tested for blood sugar, serum cholesterol, and TG test.

Table 1 shows the mean concentration of blood sugar, serum cholesterol, and serum TG among females according to age groups, whereas Table 2 demonstrates the mean concentration of blood sugar, serum cholesterol, and serum TG among males according to age groups. The mean concentration of blood sugar among female age groups in comparison with male age groups is shown in Table 3.

Table 4 illustrates the mean concentration of serum cholesterol among female age groups in comparison with male age groups,

Table 1: Concentration of blood sugar, serum cholesterol, and serum triglyceride among females according to age groups

Age (years)	Blood sugar (mmol/L)	Serum cholesterol (mmol/L)	Serum triglyceride (mmol/L)
>25	11.28	4.8	3.9
26–35	12.54	5.95	3.03
36–45	12.92	5.5	2.45
45–55	13.5	4.75	2.15
<55	10.73	5.2	1.8

Table 2: Concentration of blood sugar, serum cholesterol, and serum triglyceride among males according to age groups

Age (years)	Blood sugar (mmol/L)	Serum cholesterol (mmol/L)	Serum triglyceride (mmol/L)
>25			
26–35	9.95	4.55	2.3
36–45	12.13	4.58	2.43
45–55	17.18	4.28	3.55
<55	11.7	3.05	3.62

Table 3: Concentration of blood sugar among female age groups in comparison with male age groups

Age (years)	Female patients (mmol/L)	Male patients (mmol/L)
>25	11.28	0
26–35	12.54	9.95
36–45	12.92	12.16
45–55	13.5	17.18
<55	10.37	11.7

whereas Table 5 shows the mean concentration of serum TG among female age groups in comparison with male age groups.

The results obtained in this study showed that among female groups, the mean concentration of blood sugar was 13.5 mmol/L in the age group of 45–55 years, serum cholesterol was 5.95 mmol/L in the age group of 26–35 years, and serum TG was 3.9 mmol/L in the age group of <25 years, respectively, whereas in the male groups, blood sugar was 17.18 mmol/L in the age group of 45–55 years, serum cholesterol was 3.05 mmol/L in the age group of <55 years and serum TG was 3.62 mmol/L in the age group <55 years, respectively.

Table 3 reveals that both genders had a high concentration of blood sugar in the age group of 46–55 years (13.5 mmol/L in males and 17.18 mmol/L in female) which may be due to geriatric DM; serum cholesterol levels at the same age groups were within normal values [Table 4]. Normal levels of cholesterol vary with age, diet, and geographical region. Table 5 shows the high concentration of serum TG in both genders (in the age group of 26–35 years for females and in the age group of <55 years for males). This variation may be due to diet and geographical region. Finally, the results in this study showed a weak relation between the increase in lipid levels and the increase in blood sugar levels.

The changes in glucose concentration for both genders after 55 years as shown in Table 3 may be due to the present study data.

TG increased and cholesterol decreased with age in females as shown in Tables 4 and 5, which may be due to hormonal changes during female aging, but in males, the picture is

Table 4: The mean concentration of serum cholesterol among female age groups in comparison with male age groups

Age (years)	Female patients (mmol/L)	Male patients (mmol/L)
>25	4.8	0
26–35	5.95	4.55
36–45	5.51	4.58
45–55	4.76	4.28
<55	5.2	3.05

Table 5: The mean concentration of serum triglyceride among female age groups in comparison with male age groups

Age (years)	Female patients (mmol/L)	Male patients (mmol/L)
>25	2.56	0
26–35	3.03	2.3
36–45	2.45	2.43
45–55	2.16	3.55
<55	1.8	3.62

opposite to females in the present study, which may be due to their physical structure and also the diet.

From this study, it can be concluded that glucose level may be elevated with age. There is no increase in lipid (cholesterol and TG) that leads to an increase in glucose level; there is weak relationship between diabetic patient and lipid (cholesterol, TG) with age. Any patient suffering from lipid elevation must check blood sugar at least every 6 months.

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Conflicts of interest

There are no conflicts of interest.

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