

Determination of the Concentrations of Serum Visfatin, and Endothelin -1, in obese Diabetes Mellitus type 2 Patients in Tikrit City-Iraq.

Raghad Tahseen Thanoon⁽¹⁾

Mossa M. Marbut⁽²⁾

Wahbi A. Salman⁽³⁾

(1)College of Dentistry, (2) College of Medicine, (3) College of Education for Women. (1,2,3)Tikrit University, Iraq.

Article Info:

-Article History:

-Received: 8/5/2020

-Accepted: 21/6/2020

-Available Online:

*7/2020

Keywords:

BMI, Visfatin, endothelin, DMT2, obesity.

Corresponding Author:

Name: Raghad T. Thanoon

E-mail: rtahsee@gmail.com

Tel: 07718693438

Affiliation:

(1) Asst. Lec. Department of Basic Sciences, College of Dentistry, Tikrit University, Iraq. (2) Prof. College of Medicine, Tikrit University, Iraq. (3) Prof. College of Education for Women, Tikrit University, Iraq.

Abstract

Background: The aim is to determine the concentrations of serum Visfatin, and Endothelin -1, in obese Diabetes mellitus type 2 patients in Tikrit city-Iraq. **Patients and methods:** Ninety subjects include in the study, 35 patients diagnosed with type -2 Diabetes mellitus and obese, while 35 patients diagnosed with obese only and 20 healthy subjects as Control. The study was carried out in Salah-Aldin Hospital in Salah – Aldin governorate from beginning of March to end of June 2019. **Result:** There was a significant increase in serum Visfatin level in obese DMT2 (G1) & obese patients as compare with healthy subjects ($G3P \leq 0.05$). Moreover, regarding endothelium 1- there was a significant elevation in ET-1 in obese DMT2 (G1) & obese patient as compare with control subjects ($G3P \leq 0.01$).

Introduction:

Type 2 diabetes is the most common type of diabetes. Family history and genes play a large role in type 2 diabetes. Other risk factors include a low activity level, poor diet and excess body weight around the waist ^(1,2). Visfatin has the ability to bind to insulin receptors causes hypoglycaemia by stimulating glucose utilization in adipocytes and myocytes, ⁽³⁻⁵⁾. Increased circulating levels of Endothelin -1 (ET-1)

has been found in patients with diabetes mellitus patients. ET-1 is a potent vasoconstrictor peptide, ⁽⁶⁾. The aim of the study is to measure the levels of serum endothelin -1 and visfatin in diabetes mellitus type 2 patients.

Patients and methods

Ninety subjects who include in the present study, 35 diabetes mellitus type 2 patients,

while 35 obese patients and 20 Controls. The study was carried out in Salah-Aldin Hospital in Salah –Aldin governorate from beginning of March to end of June 2019. Body weight and height were measured & Body mass index calculated from body weight in Kilogram divided by body height in meter square.

According to the following equation:

$$BMI = \text{weight (kg)} / (\text{height})^2 \text{ (meter)},^{(7)}.$$

A- inclusion criteria of subjects

- 1-Diagnosed as newly type 2 diabetic patients
- 2-Aged 40 – 65 years old
- 3-Obese normotensive subjects (BMI more than 30 kg/m²).

B-Exclusion criteria

- 1-Type 2 DM on treatment.
- 2-Hypertensive patients on treatment.
- 3-Patients with cardiac diseases.
- 4-type 2 diabetic patients with physical, mental or cognitive limitation.
- 5- Patients with other endocrine disorders.

Approximately 5 ml of fasting human blood was collected from each subjects and transferred into sterilized test tubes and allowed for 30 minutes to clot at room temperature , the sample was centrifuged for 5 minutes at 3500 rotations per minute and the serum was immediately separated and stored at (-20°C) till used for biochemical analysis . Serum Visfatin, and Endothelin -1 were measured by using human Elisa kits manufactured by bioassay technology laboratory company-China.

Results and Discussion:

Table (1) show the age, and anthropometric measurements, body mass index (BMI), in all groups, Obese DMT2, Obese and control. However, there is significant elevation in BMI in obese patients with DMT2, (G1), patients with obesity only, (G2), as compare with control group, (G1); ($p \leq 0.01$). In previous study, it was found that there association between the risks to get diabetes mellitus increases positively with the increase in body mass index, ⁽⁸⁾. Table (2) and Fig.(1) show the concentration of serum vasfatin (ng/ml) in all groups . There is an increase in the concentration of serum visfatin in obese DMT2 & obese as compare with control healthy subjects ($P \leq 0.05$). Previous study agree with the present finding in G1 and G2 that serum, ⁽⁸⁻¹⁰⁾.

Moreover, regarding endothelium 1- Table (3) and Fig.(2), show the concentration of (ET-1 ng/L) in all groups. There were a significant elevation in ET-1 in obese DMT2 (G1) & obese patient as compare with control subjects ($G3P \leq 0.01$). Previous study have showed an elevated of endothelin I (EI) in some patients with Diabetes Mellitus Type 2 ⁽¹¹⁾. This elevation of Endothrlin-1 may be activate angiotensin II receptor type 1 (AT1), then produce inflammatory cytokines, and lead to increase in macrophage chemo-attractants substances, also activate reactive oxygen species that produce oxidative stress in myocytes and smooth muscle cells, ⁽¹²⁾.

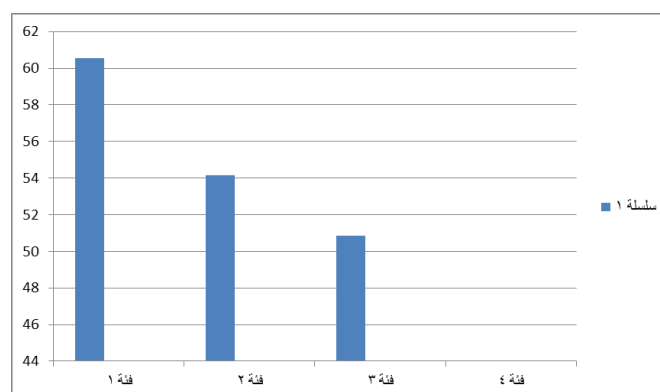


Fig. (1): The mean values and SD of Vasfatin in G1,G2&G3.

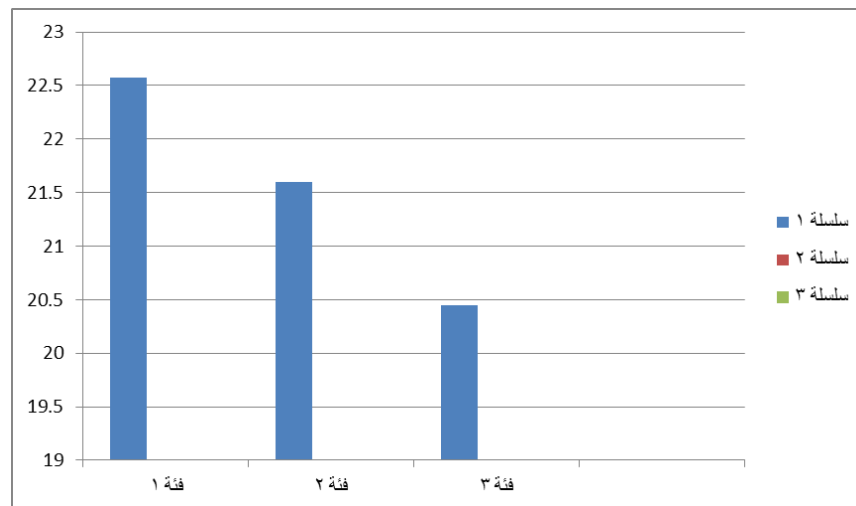


Fig. (2): The mean values and SD of ET-1 in G1,G2&G3.

Table (1): Show the age, and anthropometric measurements, body mass index (BMI), in all groups, Obese DMT2, Obese and control.

	DMT2	Obese	Control	P value
Age (years)	52.38±9.6	50.2±7.5	49.7±6.1	NS
Body weight(Kg)	96.4±20.8	80.1±10.5	74.7±4.5	0.01
Height (Cm)	169.2±5.8	170.5±5.6	173.9±5.9	NS
BMI (Kg/m2)	30.2±2.2	29.3±2.2	24.1±1.4	0.01

Table (2): The concentration (mean values and SD) of Vasfatin in G1,G2&G3

Groups	Mean ±SD (ng/ml)	P≤ value
Diabetes Mellitus type 2 & Obese (G1).	60.6 ± 40.1	0.05*
Obese only, (G2)	54.2 ± 25.2	0.05*
Controls, (G3)	50.84 ± 27.7	

Table (3) The concentration of (mean values and SD) of ET-1 in G1,G2&G3 .

Groups	Mean ±SD (ng/l)	P≤ value
Diabetes Mellitus type 2 & Obese, (G1)	22.58 ± 1.95	0.01**
Obese only, (G2)	21.59 ± 1.43	0.01**
Controls, (G3)	17.45 ± 1.16	

References

- 1-Dibner C, Schibler U, Albrecht U. The mammalian circadian timing system: organization and coordination of central and peripheral clocks. *Annu Rev Physiol.* 210; 72: 517-49.
- 2- Aljabri K, et al,. The Relation between Overweight and Plasma Lipids in Saudi Adults with DMT 2. *Int J Diabetes Clin Res.* 2015; 2: 33-39.
- 3- Gunduz, FO., Yildirmak, ST., et al. Serum Visfatin levels and Glycemic Control in Patients with Obese Type 2 Diabetes Mellitus. *Diabetes Metab.* 2011; 35: 523-28.
- 4- Haider DG, Schaller G, Kapiotis S. The release of the adipocytokine visfatin is regulated by glucose and insulin. *Diabetologia.* 2006; 49: 1909-14.
- 5- Fukuhara A, Matsuda M, Nishizawa M, et al. Visfatin: a protein secreted by visceral fat that mimics the effects of insulin. *Science.* 2006; 307: 426-30.
- 6- Mohammed , M.N. and Twwwfik , NM. The effect of metformin on ghrelin serum level in type 2 diabetes mellitus . *Iraq Journal of Pharm.* 2018; 13: 86-94 .
- 7- De- Onis M. and Habicht JP. Anthropometric reference data for international use: recommendations from a World Health Organization committee. *Am J Clin Nutr* 1996; 64:650-8.
- 8- Zahorska-Markiewicz B, Olszanecka-Glinianowicz M, Janowska J. et al. Serum concentration of visfatin in obese women. *Metabolism.* 2007; 56: 1131–34.
- 9-Olszanecka–Glinianowicz, M, Janowska,J. et al. Plasma visfatin and TNF–a levels in metabolic syndrome. *Kardiologia Polska.* 2011; 69, 8: 802–7.
- 10- Chen MP, Chung FM, Tsai JC. Elevated plasma level of visfatin/pre-B cell colony-enhancing factor in patients with DMT2. *Journal of Clinical Endocrinol Metab.* 2006; 91: 295-9.
- 11- Altieri P., Alvarado S., Banchs H., Escobales N., Crespo M. The role of Angiotensin II and Endothelin I in the cardiomyopathy of diabetic patients. *J Investigative Med .* 2012; 11: 81-88.
- 12- Heeneman S, Sluimer J, Daemen Mat JAP. Angiotensin converting enzyme and vascular remodeling. *Circ Res.* 2007; 101: 441-54.