EVALUATION LEVEL OF APELIN AND GALANIN IN PATIENTS WITH DIABETES MELLITUS TYPE2

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ABSTRACT

This study was conducted for a sample of diabetes mellitus type2 who included males and females as well as healthy people as compared we were measured Apelin and Endogenous Galanin. The results displayed that there were a significantly decreased in Apelin and Endogenous Galanin significantly increase in values .That aged ranged from (30-70) year, for both male and female patients with diabetes mellitus type2 and healthy control groups.

Keywords :DMT2,Apelin,Endogenous Galanin.

Diabetes mellitus (DM) is a chronic metabolic disorder characterized by hyperglycemia that develops as a consequence of insulin deficiency (type 1 DM) and/or insulin resistance (type 2 DM [T2DM]). It is a common disorder with increasing prevalence worldwide (1, 2). In Iraq, the prevalence of diabetes had been increased dramatically over the last 4 decades to reach around 20%. (3) Moreover, DM is considered as a leading cause of death in most developing countries. (4,5) especially in Iraq. (6) This may be attributed to uncontrolled hyperglycemia, which is associated with many serious complications such as renal failure and cardiovascular disorders. (2) Glycemic control is necessary to reduce morbidity and mortality of DM through the prevention and/or delay of these complications. (7) Optimum glycemic control can be achieved only when the patients are adherent to self-management behaviors such as healthy diet, physical activity, monitoring of blood glucose, taking medications, reducing the risk factors, ability to resolve diabetes problems, and healthy coping. (7,8) Type 2 DM is due primarily to lifestyle factors and genetics. (9) A number of lifestyle factors are known to be important to the development of type 2 DM. These are physical inactivity, sedentary lifestyle, cigarette smoking and generous consumption of alcohol. (10) Obesity has been found to contribute to approximately 55% of cases of type 2 DM. (11) The increased rate of childhood obesity between the 1960s and 2000s is believed to have led to the increase in type2 DM in children and adolescents. (12) Environmental toxins may contribute to the recent increases in the rate of type 2 DM. A weak positive correlation has been found between the concentration in the urine of bisphenol A, a constituent of some plastics, and the incidence of type 2 DM. (13) This study was conducted to measure the level of Apelin and Endogenous Galanin.

I. MATERIALS AND METHODS

The study was accomplished on sample of 90 people ,including 45 people with Diabetes Mellitus type2 (DMT2),and the control sample included 45 healthy people including 31 female and 14 male for both Diabetic and healthy groups,and age range from(30-70)year .The study was conducted in diabetes and Endocrinology center.Statistical Analysis The results were analyzed by using the (SPSS) Analysis of variance by ANOVA table as well as excretion mean and standard deviation depending on basic statistic method

II. RESULT

The products of the study displayed that Diabetes Mellitus Type2 has direct effect on some of the blood parameters of all age and sex group.
There was a significantly difference increase and decrease between patients with DMT2 patients and control in biomarkers and biochemicals parameters.

Table (1) level of Apelin and Endogenous Galanin in patients and healthy control groups.

<table>
<thead>
<tr>
<th>parameters</th>
<th>subject</th>
<th>Mean±SD</th>
<th>p.value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apelin(pg/ml)</td>
<td>45 patients</td>
<td>545.5 ± 221.3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>45 control</td>
<td>920.7 ± 404.1</td>
<td></td>
</tr>
<tr>
<td>Endogenous Galanin(pg/ml)</td>
<td>45 patients</td>
<td>29.1 ± 16.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>45 control</td>
<td>21.8 ± 11.7</td>
<td></td>
</tr>
</tbody>
</table>

As for the blood parameters, the results displayed that there was a significantly difference increase in valuable of c-peptide, HBA1C, FBS, Microalbuminuria, urea and creatinine except that vitaminD3 level of was significantly decrease under the level of probability 0.001 in comparing the products between illness of male and female of all ages groups table (2). Results displayed that DMT2 patients had a significant effects on the level of Apelin compared with healthy where concentration was significantly lower in both sexes and in all aged groups as showin in figure(1)

Figure (1): serum Apelin level among type2 diabetes patients and healthy control groups.

While results of Endogenous Galnin displayed that DMT2 patients was significantly higher in both sexes and all aged groups comparing to healthy groups figure(2).
III. DISCUSSION

Significantly decreased circulating apelin levels at (p ≥0.001). Besides, plasma Apelin seems to be associated with IR and circulating adiponectin concentration. The results are new and of importance concerning the specifically selected group of a newly diagnosed and treatment naïve T2DM patients having no additional condition associated with inflammation, IR or medication of any. Apelin, a newly described adipokine, has various effects in many organ systems including regulation of blood pressure and vascular tone (14,15,16), cardiac contractility and circulation (17), heart rate (18), food intake (19), anterior pituitary functions (20), angiogenesis (21), apoptosis (22) and inflammation (23). However, the patient population enrolled in that work had the disease for several months to years and were under treatment with antidiabetics at the time of sampling. The results of the present investigation with a selected group of patients are not consistent with the previous data and, as in the case of most other diseases, synthesis and/or secretion of apelin seem to be down regulated in treatment naïve T2DM. Data obtained from the present study of Endogenous Galanin levels for men and women showed significant increase (p>0.001) in level of plasma galanin in all age groups compared to healthy control. Also the same results were found in women.

Clinical studies indicated that the galanin concentration was correlative to morbidity of type 2 diabetes mellitus in humans (24; 25, 28, 26, 27, 30).

These data are supported by a series of other studies overall demonstrating that plasma levels of galanin increase following glucose administration (25, 30, 31). At 1 h and 2 h after dinner, serum galanin, insulin and glucose levels were significantly higher in patients with impaired glucose tolerance (IGT) than in controls with controls (31). Notably, a link between galanin and insulin resistance is also suggested by the fact of galanin resistance. It appears paradoxical, at first glance, that galanin can increase insulin sensitivity to reduce the blood glucose level, but the high circulating galanin level is observed in patients with hyperglycemia and type 2 diabetes mellitus (24,26,29,30,33,34,32,35,36) This is similar to the situation of insulin which can decrease the blood glucose level, but patients and animals with type 2 Diabetes mellitus frequently present both hyperinsulinism an hyperglycemia. Accordingly, similar to insulin resistance also, a new concept of galanin resistance emerged, which referred to the discrepancy between high galanin level and low glucose handling (27,30). Recent results supported a conjecture that the high level of galanin was in response to the development of galanin resistance in obese and type 2 diabetic male subjects (26, 27,30). In summary, there is accumulating preclinical and clinical evidence overall supporting a beneficial effect of galanin pathway activation for improvement of glucose handling and treatment of type 2 diabetes mellitus.

IV. CONCLUSION

We have shown that plasma apelin is reduced in newly diagnosed and untreated patients with T2DM who have no additional disorder. High levels of serum Galanin Current data support that the galanin peptide family can regulate glucose metabolism.

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Ethical Clearance: A formal permission taken from responsible diabetes and Endocrinology center in Marjan Teaching Hospital in Babylon –Iraq.

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Conflict of Interest: Nil

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