Turkish Journal of Endocrinology and Metabolism, (1998) 4 : 239-241 **ORIGINAL ARTICLE**

The Changes in Serum Prolactin Levels in Diabetic Coma and Effect of Octreotide Acetate, a Long Acting Somatostatin Analogue

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In this study, we investigated serum prolactin levels and the effect of octreotide acetate in 10 healthy men (control group) and 10 male patients with diabetic comatose conditions. Basal serum prolactin levels in the control group were 3.39 ± 1.51 ng/ml whereas after octerotide acetate administration (100 microgram. subcutaneously), serum prolactin levels were found as 5.29 ± 4.59 ng/ml, 6.28 ± 4.70 ng/ml and 3.56 ± 2.25 ng/ml respectively at 30th, 60th and 120 th minutes. Basal prolactin levels in diabetic comatose patients were 5.22 ±3.78 ng/ml and in the same patients prolactin levels at the 30th, 60th and 120th minutes were 5.29 ± 3.10 ng/ml, 3.15 ± 2.68 ng/ml and 5.05 ± 4.5 ng/ml respectively. These results suggest that, analogues of somatostatin had no effect on prolactin secretion in healthy men and male patients with diabetic coma. It seems that absence of somatostatin receptors in lactotroph cells were responsible for this result. Our results showed that serum prolactin levels at least were not increased in comatose conditions of diabetic male patients and administration of octreotide acetate also had no effect on secretion of prolactin in diabetic coma.

Conclusions ; 1-Octerotide acetate has no effect in prolactin secretion in both healthy men and male patients with diabetic comatos conditions. 2-Probably somatostatin receptor s are absent in lactotroph cells .

KEY WORDS Prolactin, octreotide acetate, diabetic coma, somatostatin

Introduction

Some studies show us that there are changes in the prolactin levels of diabetic patients. One thesis revealed that male diabetic patients with libido insufficiency had high prolactin levels (1). In opposition to this thesis one study claimed that there was no increase in prolactin levels in the same conditions (2). To explain these oppositions, experimental animal studies carried out with streptozotocin induced diabetic male rats showed that there was a decrement in plasma prolactin levels (3). This study revealed that stimulation of opioid receptors in non-diabetic male rats increased the prolactin levels but there was no increment in prolactin levels of diabetic rats (3). Many studies claim that prolactin levels of diabetic patients are low, but some studies donot support this idea (4). Previous reports also revealed that prolactin levels did not significantly change in streptozocin-induced diabetic male rats (5). It was shown that diabetic rats who had dehydration and high plasma osmolality had high dopamine levels in the cerebellar, thalamic and hypothalamic area (6). Some authors claimed that patients with diabetic ketoacidosis had high serum prolactin (7). Our study aimed at administration of a long acting somatostatin analogue (octerotide acetate) to healthy and diabetic comatose patients and at investigating the

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effect of octreotide on prolactin secretion in both groups.

Material and Methods

This study was realized at The University of Dicle, School of Medicine in the Department of Endocrinology. The patients who were hospitalized with a diagnosis of diabetic coma (ketoacidosis and/or hyperosmolality) in the department of endocrinology between January 1995 and December 1995 were studied. Subjects who were hospitalized in the department of endocrinology with various complaints and finally found to have no pathologic findings were studied as a control group.

Control group: In the control group there were 10 healthy men 17-41 years old. Control subjects had no history of drug intake or disease. We measured the fasting blood glucoce before the octerotide test and 120 minutes after the test. The Octreotide test was performed at 09:00am, after 12 hours of fasting. This group of subjects was evaluated with the Glasgow coma scale; all the subjects' points were fifteen (8). All of the control group subjects' BMI (Body Mass Index) and arterial blood pressures were normal (BMI: 21-27 kg/m^2 and arterial blood pressure 100/70 -125/85 mmHg).

Patients: There were 10 patients with diabetic coma. They were hospitalized in the period between January 1995 and December 1995 at the University of Dicle, School of Medicine, Department of Endocrinology and Metabolism. All of the subjects were male and did not take any drug which could affect plasma prolactin levels. After the physical examination, subjects were evaluated by the Glasgow coma scale (8). One patient had diabetic non-ketotic hiperosmolar hyperglycemic coma, all of the other patients had diabetic ketoacidosis. The patients were 15-70 years old. Three patients were type-1 diabetes mellitus, seven patients were type-2 diabetes mellitus. Except one, all of the other patients had diabetic retinopathy and neuropathy. Their arterial blood pressures were 90/50-140/70 mmHg. Two of the subjects had coronary heart disease and they were taking asetyl salicilic acids and nitrates. Subjects' BMI were 18-32 kg/m^2. All the patients' HbA1c levels reflected poor glycemic control (HbA1c levels > 12 %). Octerotide test was performed on all the diabetic patients with coma immediately after their hospitalization. The octreotide test was applied in the period between 08:00 am and 21:00 pm. During the test time no drug was administered to the patients except insulin and 0.9 % NaCl solutions.

Octerotide test: The blood samples were collected in EDTA tubes, thirty minutes after the insertion of a 22 gauge catheter in to the antecubital vein and these blood samples were named basal values. After this procedure, 100 micrograms of octreotide acetate were administered to the patients subcutaneously. Blood samples were collected in EDTA tubes at the 30th, 60th and 120th minutes after octreotide administration. All of the blood samples were centrifuged immediately. Blood glucose levels were measured 120 minutes after the octreotide administration. The blood samples were kept in deep-freeze (-20°C). All the prolactin levels were measured on the same day and under the same conditions.

Prolactin measurements: The serum Prolactin (Prl) levels of patients were measured by enzyme Immunoassay "RA-50 chemistry Analyser (Technicon-ames)" and prolactine EIA bio Merioux kits were used. The values were found as ng/ml. The accepted normal values were 2-13 ng/ml for men.

Analysis of results: The prolactin value of groups and the changes of value between the groups were compared by Student -t test.

Results

The mean blood glucose levels of the control group were 89.4 ± 15 mg/dL and. mean blood glucose levels of diabetic patients with coma were 383 ± 73 mg/dL. Blood glucose levels of diabetic patients were significantly higher than the control group ($P<0.01$). The One hundeed twenty minutes after the administration of octreotide blood glucose levels were 88 ± 11.3 mg/dL in the control group and 258 ± 43 mg/dL in diabetic patients with coma The 120th minutes blood glucose levels of diabetic patients with coma were significantly lower than the basal level. Basal serum prolactin levels in the control group were 3.39 ± 1.51 ng/ml whereas after the octreotide acetate administration (100 microgram. subcutaneusly), serum prolactin levels

were found as 5.29 ± 4.59 ng/ml, 6.28 ± 4.70 ng/ml and 3.56 ± 2.25 ng/ml respectively at the 30th, 60th and 120 th minutes. Basal prolactin levels in diabetic comatose patients were 5.22 ± 3.78 ng/ml and at the30th, 60th and 120th minutes after octreotide injection serum prolactin levels were 5.29 ± 3.10 ng/ml, 3.15 ± 2.68 ng/ml and 5.05 ± 4.5 ng/ml respectively. (The data are shown in Table 1). According to these results; octreotide administration has no statistically significant effect on the serum prolactin levels of the control group and patients with diabetic coma. After octreotide administration prolactin levels of diabetic patients had no any significant changes.

Table 1. Prolactin levels of subjects in this study, before and after the administration of octerotide acetate.

GROUPS	PROLACTIN			
	Basal	30th min.	60th min.	120th min.
Control	3.39±1.51	5.29±4.59	6.28±4. 70	3.56±2.25
Diabetic koma	5.22±3.78	5.29±3.1	3.15±2.68	5.05±4.51

Discussion

In this study, the average of basal serum prolactin levels and average levels of serum prolactin which were obtained after the octreotide administration in the control group were normal. These results are in parallel with the literature which expressed that somatostatin analogues have no effects on the prolactin levels of healthy men. The absence of a somatostatin receptor in the lactotroph cells may be responsible for this condition (9). As a matter of fact somatostatin can have a positive effect on hypersecretion of prolactin caused by growth hormone secreting tumors although it has no effect on prolactin secreting hypophyseal tumors (10). In our study the basal prolactin levels of patients with diabetic coma are normal and after octerotide administration we did not observe significant differences in the levels of prolactin. Some authors claim that dopaminergic tonicity may decrease or increase in diabetic patients. Dehydration and/or hyperosmolality can cause high levels of dopamine in the hypothalamic area of diabetic rats (9). Some studies express that diabetic ketoacidosis decreases the plasma prolactin levels and increase the plasma levels of catecholamines. Our results show that serum prolactin levels at least did not increase in comatose conditions of diabetic male patients and administration of octreotide acetate had no effect on secretion of prolactin in diabetic coma. It seems that an absence of somatostatin receptors in lactotroph cells was responsible for this result. Conclusions; 1- Octreotide acetate has an effect on prolactin secretion in both healthy men and male patients with diabetic comatose conditions. 2- Probably somatostatin receptors are absent in lactotroph cells.

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