مجلة الدراسات التربوية والعلمية - كلية التربية - الجامعة العراقية
العدد الخامس والعشرون - المجلد الثاني عشر - علوم الحياة - آب 2025 م
doi.org/10.52866/esj.2023.12.25.19

The effect of prolactin level on kidney in women with hyperprolactinemia

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Abstract :

The Prolactin is a hormone secreted by the anterior pituitary gland. Also, the prolactin is produced by various tissues in the body. Its role of is to organize the breast development in women, its introduction are changed in different women with chronic kidney disease which causes the hyperprolactinemia. As well as, CKD is correlated with elevated the dangerous of coronary artery disease. The aim of the study to explain the effect of hyperprolactinemia on the kidney in these patients . As the results showed increased in the levels of prolactin hormone in the patients (23.46) ng / ml compared with the control group (11.01) ng / ml, as wheel as these results showed significant increase in the albumin levels (5.80) g / l, as compared with the controls (4.45) g / l, also the creatinine (0.89) mg / 100ml was higher than the controls groups (0.57) mg / 100ml and the urea levels were significantly higher in patients (46.40) mg / 100 ml when compared with the healthy groups (24.18) mg / 100 ml.

Keywords: Serum prolactin, Chronic kidney disease, Hypertension, urea, creatinine, albumin.

تأثير مستوى البرولاكتين على الكلى لدى النساء المصابات بفرط برولاكتين الدم

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مستخلص:

البرولاكتين هرمون تفرزه الغدة النخامية الأمامية. كما تُنتجه أنسجة مختلفة في الجسم. دوره هو تنظيم نمو الثدي لدى النساء، ويختلف إفرازه لدى النساء المصابات بأمراض الكلى المزمنة، مما يُسبب فرط برولاكتين الدم. كما يرتبط مرض الكلى المزمن بارتفاع خطر الإصابة بأمراض الشريان التاجي. يشرح هذا البحث العلاقة بين فرط برولاكتين الدم وظهور تلف الكلى لدى هؤلاء المرضى.

هدفت الدراسة إلى توضيح تأثير فرط برولاكتين الدم على الكلى لدى هؤلاء المرضى. حيث أظهرت النتائج ارتفاع مستويات هرمون البرولاكتين لدى المرضى (23.46) نانوغرام/ مل بالمقارنة مع مجموعة الاصحاء (11.01) نانوغرام/ مل، كما أظهرت هذه النتائج ارتفاعًا معنويًا في مستويات الألبومين (5.80) غم/ لتر بالمقارنة مع مجموعة الاصحاء (4.45) غم/ لتر، كما كان الكرياتينين (0.89) ملجم/ 100 مل أعلى من مجموعة الاصحاء (0.57) ملجم/ 100 مل، وكانت مستويات اليوريا أعلى معنويًا لدى المرضى (46.40) ملجم/ 100 مل بالمقارنة مع المجموعات السليمة (24.18) ملجم/ 100 مل.

الكلمات المفتاحية: برولاكتين المصل، مرض الكلى المزمن، ارتفاع ضغط الدم، اليوريا، الكرياتينين، الألبومي.

1 .Introduction

The Prolactin indicated different role in the human body as it could stimulate the mammary glands for milk production , also it stimulates the secreted of Oligodendrocyte cells which introduced the myelin that considered the cover of the axon in the central nervous system [1]. Despite the renal of a human weighted less than (0.5%), they deals with about (2000) liters of blood per day. The chronic kidney disease (CKD) is characterized by the change in the kidney function which causing the metabolic and synthetic failed in the accumulation of some nitrogenous substances and exist with different clinical appearance [2] . The chronic kidney disease (CKD) is consider one of the world's most higher risk factors for coronary heart disease as its associated with the increased in the prolactin serum levels. The Prolactin secreted is decrease in CKD, and its production is change as wheel as its activity is also raised [3]. Several research illustrated that the prolactin may have a large biologic role that cooperate in the atherosclerotic process and causes the insulin resistance [4]. It is also correlated with endothelial damage. Hyperprolactinemia is establish in women patients with major hypertension .The increase levels of serum prolactin which occurs in CKD may due to vascular disturbance [5]. This could lead to lower cardiovascular events among CKD patients. This was consider as an important medical and biochemical sign of serum prolactin levels in women with CKD [6] .Hyperprolactinaemia is a usual biochemical occurrence found in pituitary tumors, medication, pituitary failure , pregnancy, chest lesions (in the T4 dermatome) and the renal damage [7]. The clinical symptoms of hyperprolactinaemia vary according to the patient's age and sex such as the headaches and cranial neuropathies [8]. The serum prolactin levels correlated with the aetiology; so the prolactin level greater than 250 µg/L indicate a prolactinoma whereas the serum above than 500 µg/L is denote of a macroprolactinoma [9]. Hyperprolactinaemia is a common endocrine unusual in patients with renal damage [4,5]. In patients with hyperprolactinaemia symptoms could lead

for a prolactinoma [10] .

2. Materials and methods

The women samples were collected (180 samples) from Medical city complex with ages ranging from (28-45) years to estimate some biochemical characteristics in the blood serum and compared with the (180 samples) for controls group when the serum was obtained by placing a few milliliters of blood drawn in a plastic tube with a tight cap and free from anticoagulant as it was placed in Centrifuge for 15 minutes at a speed of 3000 r / min. The serum was kept at freezing (-20) ° C until analysis of biochemical tests was performed [11].

2.1 Concentration of prolactin in the blood serum

The concentration of Prolactin was estimated by the steps provided with the ready ELISA kit according to the instructions for ELISA technology [12].

2.2 Concentration of albumin in the serum

The serum albumin concentration was estimated using a ready ELISA kit from the French company Biolabo, a color method [12].

2.3 Concentration of creatinine in serum

The serum creatinine concentration was estimated using BIOLABO SA (France) kit [13].

2.4 Concentration of Urea in serum

Urea concentration was measured in patients' serum using the Plasmatec Lab. UK kit analysis kit [12] .

2.5 Statistical Analysis:

The results were analyzed statistically by using the (SAS, 2001) program, according to the one-way analysis of variance.

3. Results and Discussion

Upon the comparison between the serum prolactin in the infected women and healthy people, the results showed a significant increase in the patients group at the level of ($P \leq 0.05$), as the concentration of the hormone in the patients group was (23.46) ng / ml compare with the control group (11.01) ng / ml. These results also showed a significant increase in the women patients group at a significant level ($P \leq 0.05$), as the concentration of albumin in the patients group was (5.80) g / l, while in

the control group was (4.45) g / l. Also the creatinine (0.89) mg / 100ml was higher than the controls groups (0.57) mg / 100ml and the urea levels were significantly higher in patients (46.40) mg / 100 ml when compared with the healthy groups (24.18) mg / 100 ml.

Table 3.1 The comparison of clinical data between the controls and patients with elevated prolactin serum

Parameters	controls	patients	p-value
Serum prolactin	ng/ ml (11.01)	ng/ ml (23.46)	($P \leq 0.05$)
albumin	g / l (4.45)	,g / l (5.80)	($P \leq 0.05$)
creatinine	.mg / 100 ml (0.57)	mg / 100ml (0.89)	($P \leq 0.05$)
Urea	mg / 100 ml (24.18)	mg / 100 ml (46.40)	($P \leq 0.05$)

These data were agreement with other findings ,as it suggested that these women suffering from a higher prolactin concentration and the reason for these is the usual fake breast-feeding; so leaving the child with no milk could catalyze the hormone to increase leading to imbalance in the hormone causing disorders of the thyroid gland secretions [14]. Upon the comparison of albumin between the two groups. The increased of albumin over its normal range can illustrated by the dehydration or eating very large quantities of protein-rich foods and increased the blood pressure [15]. The examination of creatinine in the blood serum is one of the indications of kidney failure like certain cases of kidney disease or chronic pancreatitis [16] . some research estimated a high creatinine concentration in patients with urinary tract infection and renal damage , as well as the result conducted with the chronic inflammation that may lead over time to renal damage [17] .The increase in urea could severe the urinary tract causing the accumulation of toxin and finally injury to the kidney , as wheel as the diuresis could leading to an increase in blood concentration and less flow into the kidneys [18].

For further estimation by using ECG and ECHO for those with higher serum

prolactin levels. These results showed that of the 180 women patients with hyperprolactinemia, at least 58 had coronary artery heart disease, which is approximately 67.90%, and that there is a statistically significant association between hyperprolactinemia CKD patients and the development of coronary artery heart disease among them [19].

Table 3.2 The comparison of ECG and ECHO evidence between the controls and patients with elevated prolactin serum

variable	Hyperprolactinemia negative	percentage	Hyperprolactinemia positive	percentage	p-value
ECG evidence of CAD	1	4.50%	19	67.90%	*0.001
2D ECHO evidence of CAD	1	4.50%	19	67.90%	*0.001

The Prolactin's main role in women is to set the growth of the breast and breastfeeding [20]. The level of serum prolactin increased as the kidney disease developed. The increase of serum prolactin were associated to the creatinine serum levels [21]. The hyperprolactinemia is associated with an increase in the inflammatory response leading to insulin resistance. The scientists also indicated that the Prolactin hormone some time not respond to the stimulating drugs because of the decreased in response to the disease in the pituitary [22].

5. Conclusion:

Chronic kidney disease is associated with an increased in the serum levels of the prolactin hormone (hyperprolactinemia). Hyperprolactinemia could be detected in 56% of patients with CKD

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