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Serum prolactin level and inflammation in chronic kidney disease

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Abstract
Chronic kidney disease is identified by a blood test for creatinine, which is a breakdown product of muscle metabolism. Higher levels of creatinine indicate a lower glomerular filtration rate and as a result a decreased capability of the kidneys to excrete waste products. Creatinine levels may be normal in the early stages of CKD, and the condition is discovered if urinalysis (testing of a urine sample) shows the kidney is allowing the loss of protein or red blood cells into the urine.
The study has planned in Shri Ramkrishna Institute of Medical Sciences & Sanaka Hospitals. The 25 patients diagnosed with chronic kidney disease were enrolled in to the study. The age group of the patients are from 30-70 years.
Out of 25 study cases stage III CKD patients are 2 this are having creatinine clearance of 30-60 ml/min. 10 patients who are in Stage IV of CKD were having the creatinine clearance of 15-30 ml/min. The Stage V CKD patients are 13 having creatine clearance of Less than 15 ml/min.
In the enrolled study group patients there are 13 patients are having positive serum prolactin observation and 12 patients were negative for the serum prolactin.
Form the present study it can be concluded that results of above-mentioned studies are in line with our study basal serum levels of hormone prolactin remained elevated in more than 50% of CKD patients.

Keywords: chronic kidney disease, serum prolactin level

Introduction
Chronic kidney disease (CKD) is progressive loss in kidney function over a period of months or years. The symptoms of worsening kidney function are not specific, and might include feeling generally unwell and experiencing a reduced appetite. Often, chronic kidney disease is diagnosed as a result of screening of people known to be at risk of kidney problems, such as those with high blood pressure or diabetes and those with a bloodline relative with CKD. This disease may also be identified when it leads to one of its recognized complications, such as cardiovascular disease, anemia, pericarditis or renal osteodystrophy (the latter included in the novel term CKD-MBD) [1, 2]. CKD is a long-term form of kidney disease; thus, it is differentiated from acute kidney disease (acute kidney injury) in that the reduction in kidney function must be present for over 3 months. CKD is an internationally recognized public health problem affecting 5–10% of the world population [3, 4].
Chronic kidney disease is identified by a blood test for creatinine, which is a breakdown product of muscle metabolism. Higher levels of creatinine indicate a lower glomerular filtration rate and as a result a decreased capability of the kidneys to excrete waste products. Creatinine levels may be normal in the early stages of CKD, and the condition is discovered if urinalysis (testing of a urine sample) shows the kidney is allowing the loss of protein or red blood cells into the urine. To fully investigate the underlying cause of kidney damage, various forms of medical imaging, blood tests, and sometimes a kidney biopsy (removing a small sample of kidney tissue) are employed to find out if a reversible cause for the kidney malfunction is present [5].
Prolactin (PRL), also known as lute tropic hormone or luteotropin, is a protein that is best known for its role in enabling mammals, usually females, to produce milk. It is influential in over 300 separate processes in various vertebrates, including humans [3]. Prolactin is secreted from the pituitary gland in response to eating, mating, estrogen treatment, ovulation and nursing. Prolactin is secreted in pulses in between these events. Prolactin plays an essential role in metabolism, regulation of the immune system and pancreatic development.
Hyperprolactinaemia or hyperprolactinemia is the presence of abnormally high levels of prolactin in the blood. Normal levels are less than 500 mIU/L [20 ng/mL or µg/L] for women, and less than 450 mIU/L for men.
Prolactin is a peptide hormone produced by the anterior pituitary gland that is primarily associated with lactation and plays a vital role in breast development during pregnancy. Hyperprolactinaemia may cause galactorrhea (production and spontaneous flow of breast milk) and disruptions in the normal menstrual period in women and hypogonadism, infertility and erectile dysfunction in men.
Hyperprolactinaemia can also be a part of normal body changes during pregnancy and breastfeeding. It can also be caused by diseases affecting the hypothalamus and pituitary gland. It can also be caused by disruption of the normal regulation of prolactin levels by drugs, medicinal herbs and heavy metals inside the body. Hyperprolactinaemia may also be the result of disease of other organs such as the liver, kidneys, ovaries and thyroid [6].
Several studies conducted recently are showing that prolactin may have several biologic actions that participate in the atherosclerotic process and leads to insulin resistance. It is also associated with endothelial dysfunction. Hyperprolactinemia is found in patients with essential hypertension [3], acute phase of coronary syndromes [4], during ischemic strokes [5], and transient ischemic attacks and in preeclampsia.

Higher levels of serum prolactin which observed in chronic kidney disease may contribute to vascular derangements. This influence lead to worse the condition of cardiovascular outcomes among chromic kidney patients. This was undertaken as a prospective clinical and biochemical study of serum prolactin levels in CKD patients.

Methodology

The study has planned in Shri Ramkrishna Institute of Medical Sciences & Sanaka Hospitals. The 25 patients diagnosed with chronic kidney disease were enrolled in to the study. The age group of the patients are from 30-70 years. The patients visited to Out Patient Department (OPD) and in-patient department (IPD) of a tertiary care hospital in North India were considered in the study. All the patients are informed consents. All the patient's clinical history were collected. The approval of the institutional ethical committee is taken for the planned study.

Inclusion Criteria:

- Patients with established CKD on maintenance dialysis irrespectiveof etiology
- Symptoms of uraemia for 3 months or moreElevated blood urea, serum creatinine, and decreased creatinineclearance

Exclusion Criteria:

- Patients of Chronic liver diseases
- Thyroid patients
- Pregnant Females
- Patients of seizure disorder

Blood test and urine tests were performed and data were collected. After selecting the patients, about 5 ml of blood sample is collected in a non heparinized bottle, and quantitative determination of serum prolactin was done by fully automated bidirectionally interfacedchemiluminescent immunoassay (CLIA).

Results & Discussion

The various serum and renal markers were measured in the enrolled group of patients.

The creatinine clearance is observed as below.

Table 1: creatinine clearance

Creatinine clearance	Chronic Kidney Disease Stage	Number of patients
30-60 ml/min	Stage III	2
15-30 ml/min	Stage IV	10
Less than 15 ml/min	Stage V	13

Out of 25 study cases stage III CKD patients are 2 this are having creatinine clearance of 30-60 ml/min. 10 patients who are in Stage IV of CKD were having the creatinine clearance of 15-30 ml/min. The Stage V CKD patients are 13 having creatine clearance of Less than 15 ml/min.

Table 2: Blood Urea Levels

Blood Urea mg/dl	Number of Cases
Less than 60	2
60-80	5
80-100	3
100-120	7
120-140	5
More than 140	3

The maximum number of 7 cases are observed with the blood urea level 100-120 mg/dl. Thereafter 5 cases are having blood urea level of 60-80 mg/dl and 120-140 mg/dl.

Table 3: Serum Creatinine

Serum Creatinine mg/dl	Number of Cases
Less than 5	12
5-10	9
10-15	3
15-20	1

The highest 12 cases are having serum creatinine less than 5 mg/dl. There are 9 cases are showing the serum creatinine 5-10 mg.dl.

Table 4: Serum Prolactin

Observations	Number of Cases
Positive	13
Negative	12

In the enrolled study group patients there are 13 patients are having positive serum prolactin observation and 12 patients were negative for the serum prolactin.

In CKD patients, there are alterations in signal feedback mechanisms of various hormones in the body. In addition, alteration of hormonal production and elimination occurs [7].

Patients with CKD also suffer from various other conditions such asprote in energy malnutrition, a state of chronic inflammation, multiple drug intake, and the presence of metabolic acidosis. Most importantly, there is a disturbance in the hypothalamic-pituitary-gonadal axis inpatients with CKD [8].

A Similar study of evaluating serum prolactin levels in chronic renal failure patients, CKD patients on haemodialysis, and transplant recipients was conducted by Peces *et al.*

In this study, Peces *et al.* conducted serum prolactin estimation in twelve patients with CKD who were on conservative line of treatment and thirty patients with CKD who were on haemodialysis, and nineteen patients with CKD who were post-transplant recipients with a functioning kidney [8].

Conclusion

Form the present study it can be concluded that results of above-mentioned studies are in line with our study basal serum levels of hormone prolactin remained elevated in more than 50% of CKD patients.

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