

*Research Article***Correlation between parathormone level and anemia in chronic hemodialysis patients****Osama K. EL-Minshawy, Ali M. El-Shrief and Sandy M. Ayad**

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**Abstract**

**Introduction:** HD means a process for removing waste products and excess water from the blood and is used primarily as an artificial replacement for lost kidney functions in people with kidney failure (Cozzollino et al., 2010). **Aim of the work:** Study the level of PTH in chronic HD patients, its relation to anemia and outcome of anemic patients after treatment of increased PTH level. **Patients and Methods:** **Patients:** This study was a cross sectional study of the role of PTH in ESRD and its correlation with Hb level in the participants recruited from the HD unit. The study enrolled seventy (70) patients with ESRD and on chronic HD. They were selected randomly according to inclusion criteria three days per week.

**Keywords:** parathormone level, anemia, chronic hemodialysis

**Introduction**

HD means a process for removing waste products and excess water from the blood and is used primarily as an artificial replacement for lost kidney functions in people with kidney failure <sup>(1)</sup>.

HD may be used for those with an AKI or progressive chronic kidney disease stage 5 which is called ESRD. The latter form develop over months or years and irreversible but in contrast to AKI which is usually reversible, HD is regarding as "holding measure" until kidney transplant can be performed or sometimes as the only supportive measure when transplant would be inappropriate <sup>(2)</sup>.

In CKD there is decreased renal excretion of phosphate and diminished production of calcitriol 1,25 dihydroxyvitamin D (calcitriol increases serum calcium level) the increased phosphate and reduced calcium lead to secondary hyperparathyroidism <sup>(3)</sup>

Anemia is the main character for CKD because of uremia there is decrease in appetite also there is bleeding tendency and the main secretory function of the kidney is EPO which stimulate erythropoiesis, in CKD erythropoietin not secreted which is the main cause of anemia<sup>(5)</sup>.

Over secretion of PTH has direct effect on EPO synthesis, bone marrow progenitors and red cell survival, indirect effect by bone marrow fibrosis. It is noticed that control of hyperparathyroidism increases endogenous EPO production or improves the response to EPO in chronic HD patients <sup>(6)</sup>.

**Aim of the work**

Study the level of PTH in chronic HD patients, its relation to anemia and outcome of anemic patients after treatment of increased PTH level.

**Patients and Methods****Patients:**

This study was a cross sectional study of the role of PTH in ESRD and its correlation with Hb level in the participants recruited from the HD unit.

The study enrolled seventy (70) patients with ESRD and on chronic HD. They were selected randomly according to inclusion criteria three days per week.

**Inclusion criteria:**

The patients who participated through this period and their investigations were complete.

They were divided into 3 groups as follow:

- 1- Kidney patients on chronic HD and have anemia.
- 2- Kidney patients on chronic HD and have secondary hyperparathyroidism.
- 3- Kidney patients on chronic HD and have both anemia and secondary hyperparathyroidism..

#### **Exclusion criteria:**

- Patients receiving ACEIs and ARBs also patients with external blood loss.

#### **Methods:**

##### **Patients are subjected to the following:**

- 1- Through history taking and clinical examination.
- 2- Through laboratory data.

## **Results**

**Table: Etiology of chronic kidney disease**

<b>Etiology</b>	<b>Group 1 N=30</b>	<b>Group 2 N=20</b>	<b>Group 3 N=20</b>	<b>Total N=70</b>	<b>P</b>
• Un known	11(36.7%)	2(10%)	5(15%)	18(25.7%)	0.048*
• Diabetic nephropathy	4(13.3%)	6(30%)	9(45%)	19(27.1%)	
• Hypertensive nephropathy	4(13.3%)	3(15%)	3(15%)	10(14.2%)	
• SLE	5(16.7%)	0	1(5%)	6(8.6%)	
• Cardio-renal	0	1(5%)	0	1(1.4%)	
• Cirrhotic liver	2(6.7%)	0	0	2(2.8%)	
• Others	3(10%)	5(25%)	7(35%)	15(21.4%)	

As shown from table there is statistically significant difference regarding the etiology between groups.

Unknown etiology was in about one third (36.7%) of 1<sup>st</sup> group, 10% in 2<sup>nd</sup> group and 15% of the 3<sup>rd</sup> group. Diabetic nephropathy represent the main etiology as it was 13.3%, 30% and 45% of the etiology in 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> groups respectively which is totally 27.1% in the three groups. Hypertensive nephropathy represent 13.3% in 1<sup>st</sup> group and 15% in 2<sup>nd</sup> and 3<sup>rd</sup> groups. While SLE represent the cause in 16.7% of 1<sup>st</sup> group and 5% in 3<sup>rd</sup> group. Cardio-renal causes present in 5% of 2<sup>nd</sup> group. Cirrhotic liver present in 6.7% of 1<sup>st</sup> group. Other causes represent 10% of 1<sup>st</sup> group, 25% of 2<sup>nd</sup> group and 35% of 3<sup>rd</sup> group.

## **Discussion**

Secondary hyperparathyroidism as well as anemia are common complications of CKD. In this study, a significant association was found between PTH and Hb level, which is consistent with the findings<sup>(7)</sup>.

In our study, we evaluate the correlation between Hb and PTH level in patients of

chronic HD; they were selected through the period of three months from October 2017 to December 2017<sup>(8)</sup>.

We determine common complications of CKD for better treatment of anemia and hyperparathyroidism and improvement of general conditions in patients on chronic HD.

## **Recommendations**

- 1- Routine investigations of hemoglobin and PTH level in patients on chronic HD are very important.
- 2- Nephrological consultation for early detection and proper management of secondary hyperparathyroidism so we can decrease the severity of anemia that affects general conditions of chronic HD patients.
- 3- We should tell our patients about manifestations of both anemia and secondary hyperparathyroidism for rapid consultation.
- 4- Large study should be done to detect the prevalence of anemia and hyperparathyroidism in patients of chronic HD.

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