



PREVALENCE OF ANAEMIA IN PATIENTS WITH CHRONIC KIDNEY DISEASE STAGE 5 UNDERGOING DIALYSIS.

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ABSTRACT

Though almost all patients with CKD undergoing hemodialysis have anemia, most often it is attributed to erythropoietin deficiency. But in fact, most of these patients are also suffering from other causes of anemia which is grossly ignored. Presence of anemia in CKD patients undergoing hemodialysis increases the prevalence of high output states in these patients. Thus, directly or indirectly this high output state may make the patients prone to congestive cardiac failure, acute events of silent myocardial infarction, generalized tiredness and fatigue (commonly attributed to muscle cramps associated post dialysis or to dyselectrolytemia) and other common complications like cerebrovascular accident. Hence the prevalence of anemia needs to be defined clearly so that patient can be managed accordingly.

**Summary:** Out of the 120 patients included in our study, 75 percent had anaemia. Among them 55% had mild anaemia, 27% had moderate anaemia and 18% had severe anaemia. 48% had anaemia of chronic disease mostly due to erythropoietin deficiency evidenced by normocytic normochromic anaemia in peripheral blood smear. 38% had iron deficiency anaemia evidenced by microcytic hypochromic anaemia in peripheral blood smear. 12% had other causes like mixed deficiency, vitamin B12 deficiency, folic acid deficiency as evidenced by dimorphic anaemia in peripheral blood smear.

**KEYWORDS :** ANAEMIA, CHRONIC KIDNEY DISEASE, HEMODIALYSIS, IRON DEFICIENCY.

INTRODUCTION

CKD is considered a gradually progressing irreversible deterioration of the renal function.(1) patient's ability to maintain metabolic, electrolyte balance is compromised, which may lead to acidosis or alkalosis depending upon the condition of the patient.(2) These patients should also be watched for uraemia or azotaemia. (3)

CLASSIFICATION OF CKD PATIENTS BASED ON GFR (ml/min/1.73m<sup>2</sup>):

CKD patients are classified based on the glomerular filtration rate(GFR) into stages 1- 5.(4) As the stage of kidney disease progresses it denotes advanced stage of CKD.(5)

- CKD STAGE 1 – GFR >90
- CKD STAGE 2 – GFR 60-89
- CKD STAGE 3 – GFR 30-59
- CKD STAGE 4- GFR 15-29
- CKD STAGE 5 – GFR <15

A reduction of glomerular filtration rate to less than 60 mL/min/1.73 m<sup>2</sup> indicates CKD.(6) It will be associated with structural or functional renal abnormalities.(7)

Prevalence of CKD in the United States as studied ranges from 1.5% to 15.6%.(8) One of the functions of the kidneys is erythropoietin production. Erythropoietin is a signalling molecule which is found to stimulate red blood cell production by responding to decreased oxygen levels in the blood. (9)Due to the functional abnormality in kidney diseases, there will be erythropoietin deficiency (erythropoietin is primarily produced by kidney), which has the potential to produce anaemia. This is a condition in which the number of circulating red blood cells decreases thereby producing lower haemoglobin. (10)

Other possible causes of anaemia in CKD include iron deficiency, anaemia of chronic disease, and megaloblastic anaemia.(11)

Most of the studies found that financially CKD patients with anaemia has increased healthcare costs and quality of life issues than compared to CKD patients without anaemia.(12) Most of these studies also found that the prevalence of anaemia in CKD patients increases with increase in age of the patient.(10)

MATERIALS AND METHODS

After obtaining clearance from IEC and consent from patients, we included 120 patients of age group 18-65 years, who were admitted in Sree Mookambika Institute of Medical Sciences from February 2021 to April 2021, who had chronic kidney disease stage 5 undergoing hemodialysis.

Chronic kidney disease patients with evidence of hepatorenal syndrome and Patients in intensive care unit who were sick were excluded. Relevant data were obtained, hemoglobin values and peripheral blood smear reports were taken to identify patients with anemia. Descriptive and Analytical statistics was performed by SPSS version 16. A p value of less than 0.5 was considered statistically significant.

RESULTS

Table 1: Age Distribution, Gender Distribution And Prevalence Of Anemia.

VARIABLES		PERCENTAGE
Age, years (mean)		40 years +/- 8.6
Gender	Males	60%
	Females	40%
Anaemia	Present	75%
	Absent	25%

Out of the 120 patients included in our study, 75 percent had anaemia. Mean age of the study group was 40 +/- 8.6 years. 60 percent of the study population were males and 40 percent were females.

The mean haemoglobin value calculated was 9.5g/dl. Among the 90 patients with anaemia in CKD patients, 50 patients had mild anaemia ie. 55%, 25 patients had moderate anaemia ie. 27% and 15 patients had severe anaemia ie.18%.

Among the 90 patients with anaemia in chronic kidney disease, 44 patients ie. 48% had anaemia of chronic disease most probably due to erythropoietin deficiency evidenced by normocytic normochromic anaemia in peripheral blood smear. 35 patients ie. 38% had iron deficiency anaemia as evidenced by microcytic hypochromic anaemia in peripheral blood smear. 11 patients ie.12% had other causes like mixed deficiency, vitamin B12 deficiency, folic acid deficiency as evidenced by dimorphic anaemia in peripheral blood smear.

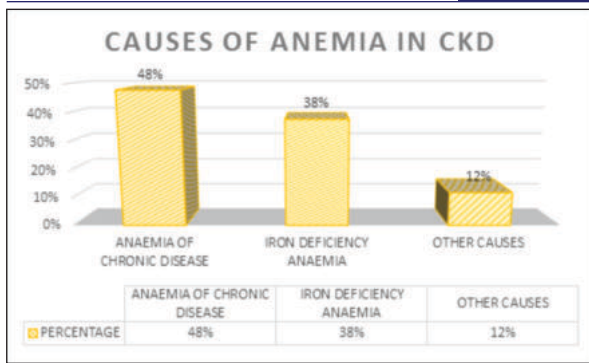


Figure 1: Causes Of Anemia In Ckd.

## DISCUSSION

CKD patients are more prone for frequent fatigue, muscle cramps, extreme range of tiredness. But these symptoms are aggravated by anaemia. Anaemia is defined as the haemoglobin level less than 13 g/dl in males and less than 12g/dl in females. To find out the appropriate cause for anaemia, peripheral blood smear is needed which mostly will be able to denote the cause of anaemia.

In our study, a significant 75 percent of patients had anaemia among patients with CKD. In the 75% patient, according to the severity of the anaemia, most of the patients had only mild anaemia and these patients required only conservative management with oral supplements of iron and subcutaneous erythropoietin injection on a weekly or twice weekly basis. Lesser number of patients had severe anaemia which needed intravenous iron sucrose supplementation and packed red blood cell transfusion. Based on the peripheral blood smear inference, the causes of anaemia are divided into anaemia of chronic disease, iron deficiency anaemia and other causes like megaloblastic anaemia and mixed deficiencies. In anaemia of chronic disease, the picture may be of normocytic normochromic anaemia or microcytic hypochromic anaemia. In iron deficiency anaemia, the picture is microcytic hypochromic anaemia. In megaloblastic anaemia, the cause may be both vitamin B12 deficiency or folic acid deficiency which shows macrocytic hyperchromic anaemia. In some patients there may be both microcytic and macrocytic red blood cells denoting dimorphic anaemia. Here, most of the patients had anaemia of chronic anaemia which was most probably considered to be of erythropoietin deficiency, the next common being iron deficiency anaemia.

## CONCLUSION

Our study shows significant prevalence of anaemia among patients with CKD. Thus, it is postulated that early detection of anaemia in CKD patients helps in appropriate management of anaemia. Thus, better and early management of anaemia helps in preventing further complications.

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