



ETIOLOGY OF CHRONIC KIDNEY DISEASE AND ITS HAEMATOLOGICAL PROFILE IN SOUTHERN RURAL HARYANA

Pathology

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KEYWORDS

INTRODUCTION

Renal failure is a medical condition in which the kidney fails to filter waste products from the blood efficiently. As per National Kidney Foundation (NKF) in India, kidney diseases rank 3rd amongst life threatening diseases, after cancer and heart disease, which rank 1st and 2nd respectively. Chronic Kidney Disease (CKD) is defined as a progressive deterioration in nephron number and function of the kidneys, due to different causes and there is kidney damage marked by albuminuria and GFR less than 60 mL/min per 1.73 m² for less than or equal to 3 months. Kidney damage is demonstrated by:

- Proteinuria more than 300 mg/day OR
- Pathological abnormality found in histopathological(HPE) study OR
- Renal image analysis (USG) showing kidneys bilaterally contracted less than 9.0 cm with thinned out parenchyma and reduced corticomedullary differentiation

CKD is identified by blood test for creatinine. More is the increase in the levels of creatinine, lower is the glomerular filtration rate and, thus decreased is the capacity of kidneys to excrete the waste products and more is the severity of CKD.

Chronic kidney disease is associated with a variety of haematological derangements. Anaemia is the most common haematological manifestation of CKD. Anaemia reflects the degree of renal damage and its most important cause being failure of renal erythropoietin production. Other factors being chronic blood loss, intravascular haemolysis and marrow suppression by retained toxic uremic metabolites. A diminished capacity to excrete toxic products may be one of the causes leading to anaemia by shortening the RBC life span, by marrow depression and by increasing the risk of blood loss. Concomitant inflammatory conditions/ malnutrition may aggravate anaemia.

Other haematological parameters effected in CKD are total leucocyte count, platelet count, bleeding time and prothrombin time, bleeding time etc. Due to limited number of researches done in our country in this regard, there is a need to carry out a study to know the effects of CKD on various haematological parameters. Such type of study is first of its kind undertaken in our medical college.

MATERIALS AND METHODS

This is a descriptive cross-sectional study based on laboratory data of (50) patients with fully diagnosed chronic kidney disease admitted in nephrology department of SGT hospital Gurugram, Haryana from a period between January 2021 to June 2021.

Inclusion Criteria

- All patients above 15 years of age
- Patients who had serum creatinine levels higher than 1.5mg/dl.

Exclusion Criteria

The following were excluded from the study:

- Pregnancy and lactating women
- Hypoplastic and aplastic anaemia
- Diagnosed haemato-oncological malignancy causing secondary

renal failure

- History of transfusion during the last 3 months
- History of EPO therapy during the past 3 months
- Patients suffering from recent haemorrhagic episodes
- Patients with history of renal transplant

METHODS

After due consideration in to inclusion and exclusion criteria, all patients had to undergo through lab investigations like haemoglobin, TLC, packed cell volume, serum urea and creatinine by standard methods available in the hospital.

The World Health Organization(WHO) has defined anaemia as Hb concentration <12 gm/dl (females), <13 gm/dl (males). Thrombocytopenia was defined with a value of $<150 \times 10^3 / l$.

Data Analysis

Data was analysed using SPSS 20.0.

RESULTS

The results showed changes in various haematological parameters of the patients of CKD. In total of 50 patients included in our studies 34 were males and 16 were females. 2% of patients were of less than 20 years of age, 4% were in age group 21-30 years, 10% were in age group 31-40, 24% were in age group 51-60 and 30% of patients were above 61 years of age. The serum creatinine levels of 8 patients were in the range from 1.5-5 mg/dl, 29 patients were in the range of 5.1-10 mg/dl, 10 patients were in the range of 10.1-15mg/dl and 3 patients creatinine levels were more than that of 15.1mg/dl.

Table 1 : Severity Of Anaemia In CKD Patients (n=50)

Haemoglobin (mg/dl)	N	%
Less than 5	3	6%
5.1 to 7	12	24%
7.1 to 10	27	54%
More than 10.1	8	16%

Table 2 : Types Of Anaemia In CKD (n=50)

Type of Anaemia	N	%
Normocytic normochromic	28	56%
Microcytic hypochromic	14	28%
Macrocytic	4	8%
Dimorphic	4	8%

Table 3 : Etiology In CKD (n=50)

Diseases	N	%
Hypertension	44	88%
Diabetes Mellitus	36	72%
Coronary Artery Disease	24	48%
Renal Calculi	11	22%
Chronic Glomerulonephritis	7	14%
Undiagnosed		14%

Table 4 : Distribution Of Total Leucocyte Count (TLC) In CKD Patients (n=50)

TLC count(per cumm)	N	%
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Less than 4000	3	6%
4001 to 12000	41	82%
More than 12000	6	12%

Table 5 : Distribution Of Packed Cell Volume (PCV) In CKD Patients (n=50)

PCV	N	%
10-20	3	6%
21-30	29	58%
31-40	10	20%
41-50	8	16%

Table 6 : Distribution Of Platelet Count In CKD Patients (n=50)

Platelet count (lakh per ml)	N	%
Less than 1	6	12%
1-1.5	6	12%
1.5-2	30	60%
More than 2	8	6%

DISCUSSION

In our study majority of subjects were males similar to the findings of Bhattacharjee K et al, Arun S et al, MN Islam et al. In the present study the main cause of CKD in most of the patients was found to be hypertension followed by diabetes similar to the findings of Bhatta S et al and George SV et al.

In the present study anaemia (less than 10gm%) was present in most (84%) cases of CKD similar to the findings of Suresh et al, Singh et al, Alghythan et al and Bhatta S et al. Anaemia correlated with the severity of renal insufficiency. Whereas the most common type of anaemia in our study was normocytic normochromic (54% of cases) similar to the studies done by Suega et al, Gautam et al and Bhattacharjee et al. In studies conducted by Bhatta S et al and Talwar et al, microcytic hypochromic anaemia was the most common type of anaemia in CKD patients. In our studies microcytic hypochromic anaemia was second (28% of cases) most common type of anaemia seen in the peripheral smear.

In the present study PCV was decreased in the patients of CKD similar to the result of studies done by Suresh et al, Singh et al, Wasti et al and Alghythan et al.

The platelet count was decreased in 24% of cases in our study which is less than that of study by Bhattacharjee et al conducted in 2015, which observed thrombocytopenia in 56% cases. In our study only 6% patient also had neutrophilic leucocytosis similar to that of results by George SV et al and Rathod SG.

CONCLUSION

Our study concluded that patients of CKD show abnormality in haematological indices. Anaemia is the main cause of morbidity in patients with CKD, which is mainly normocytic normochromic type. The prompt identification and treatment of anaemia in patients with CKD is advised for better prognosis. Hypertension followed by diabetes mellitus are the main causes leading to CKD. Thus early treatment and proper screening through kidney function tests of hypertensive and diabetic patients is highly recommended from time to time. A limited sample size in this study warrants a further detailed study in this regard to confirm the results.

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