



Research Article

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A STUDY ON THE MANAGEMENT OF ANAEMIA IN CHRONIC KIDNEY DISEASE

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ABSTRACT

Anaemia is a common complication for patients with Chronic Kidney Disease and is associated with cardiovascular comorbidities and reduced Quality of Life. Susceptibility may change depending upon the stage of chronic kidney disease, age, and social habits. A Prospective and Observational study was designed to assess the demographics of patients and variables in Anaemia along with the management of Anaemia in Chronic Kidney Disease. The suspected patient's blood samples were tested for their Haemoglobin, Erythrocyte Sedimentation Rate, and Packed Cell Volume analysed. Among 115 patients, 79 were males, and 36 were females. 58 patients (50.43%) were identified in the age group >60 years due to diabetes, hypertension and other comorbidities. The patients were given Epoetin Alpha (9.6%) and Iron Sucrose (2.3%) along with Ferrous ascorbate and folic acid (2.7%). In 113 patients (98.3%) and 109 patients (94.78%), the Haemoglobin and Packed Cell Volume were increased due to reduced immune response, comorbidity and severity of Chronic Kidney Disease. Non-pharmacotherapy was provided, and the most common was exercise, meditation (25%), Iron-rich food (2.17%) and a renal low salt diet (1.73%). Follow-up was conducted to check the improvement and found that 95.6% of patients recovered.

Keywords: Chronic Kidney Disease, Anaemia Management

INTRODUCTION

In India, Greater Burden of Disease 2015 ranks chronic kidney disease as the eighth leading cause of death. In 2017, the global prevalence of chronic kidney disease was 9.1%, with roughly 700 million cases. Since 1990, the prevalence of chronic kidney disease has increased by 29.3%. Patients with Chronic Kidney Disease have a high prevalence of Anaemia compared to non-chronic kidney disease patients. Anaemia in patients with chronic kidney disease is severe and warrants proper clinical attention for diagnosis and treatment¹.

Fatigue, weakness, dizziness, and shortness of breath are some of the signs and symptoms of anaemia. Age, sex, the elevation of habitation, smoking habits, and pregnancy condition all affect the ideal haemoglobin concentration required to meet physiologic demands.

Nutritional deficiencies, particularly iron deficiency, though shortcomings in folate, vitamins B12, and A are also common causes of anaemia; infectious diseases, such as malaria, tuberculosis, the Human Immunodeficiency Virus, and parasitic infections, are among the most common causes of anaemia. The bone marrow³ produces red blood cells. The two main treatments for anaemia in chronic kidney disease are erythropoietin (EPO) and iron. If tests suggest that the kidneys are not producing enough EPO, there may be a need for a synthetic form of this hormone and Erythropoietin Stimulating Agent (ESA). Other possible treatments include vitamin B12 or folic acid supplements⁴.

Treatment and prevention guidelines are available to minimise the prevalence of anaemia. Through fortification or supplementation with iron, folic acid, and other vitamins and

minerals, these guidelines, policies, and initiatives attempt to increase dietary diversity, improve infant feeding practices, and enhance the bioavailability and consumption of micronutrients. To modify nutrition-related behaviour, social and behaviour change communication tactics are applied. Disease control, water, sanitation and hygiene, reproductive health, and root reasons such as poverty, lack of education, and gender norms are addressed in interventions to treat the underlying and primary causes of anaemia.⁵

Folic acid comes in pill form. Diet changes like eating more foods high in iron, folic acid, and vitamin B12 could help the anaemia. In rare cases, a blood transfusion is needed. But this is done only if the anaemia is severe. To assess and evaluate the management, we will be using a treatment chart, laboratory reports, and patient interactions will be documented in a suitably designed data collection form. The follow-ups will also be documented up to discharge⁶.

In 2017, the global prevalence of chronic kidney disease was 9.1%, with roughly 700 million cases. Since 1990, most chronic kidney disease has increased by 29.3%, but age-standardized prevalence has remained unchanged during this period⁷. This study aimed to find the prevalence of Anaemia in Chronic Kidney Disease, the clinical presentations and various treatment options and counselling points to help reduce the effects of anaemia and improve the patient's quality of life. This will guide for further management of our patients in future.

MATERIALS AND METHODS

This was a prospective and observational study conducted in the General Medicine and Nephrology department of Sagar Multispecialty Hospital, Bengaluru. It included chronic kidney

disease patients diagnosed with anaemia in Outpatient Department and admitted to the nephrology ward over six months between October 2020 and March 2021. A total of 115 patients were randomly enrolled in the study.

Both previously and newly diagnosed chronic kidney disease with anaemia patients were included. Both are having controlled, and uncontrolled Haemoglobin was included.

According to World Health Organization (WHO) criteria, Anaemia was diagnosed with symptoms of Anaemia and Haemoglobin concentration <12.0 g/dl in women and 13.0 g/dl in men.

Demographic details like age, sex, weight, date of admission and date of discharge of the patients were obtained. Therapeutic related data such as the name of drugs, doses, route of administration, duration & assessment of the laboratory parameters Haemoglobin, Erythrocyte Sedimentation Rate (ESR) and Packed cell volume were analysed. To assess and evaluate the management, Patient Counselling, diet and exercise, etc. and the follow-ups up to discharge were used.

SPSS version 14 for Windows was utilised to analyse the data, and P-value was calculated, and a value <0.05 was considered significant.

Among the 115 enrolled patients, Haemoglobin and Haematocrit were below the lower limit is 98.3% and 94.7% of patients, respectively.

Table 1: Distribution of subjects according to Gender

Gender	Frequency	Per cent
Female	36	31.3
Male	79	68.7
Total	115	100.0

Table 2: Distribution of variables according to Gender (Before Treatment)

Parameter		Gender		Total
		Male	Female	
Haemoglobin (g/dl)	<12.5	77 (66.95%)	36 (31.3%)	113 (98.3%)
	12.5-17.5	2 (1.7%)	0 (0%)	2 (1.7%)
	Total	79 (68.69%)	36 (31.3%)	115 (100.0%)
ESR Range (mm/hr)	>20	79 (68.69%)	36 (31.3%)	115 (100.0%)
	1-20	0 (0%)	0 (0%)	0 (0.0%)
	Total	79 (68.69%)	36 (31.3%)	115 (100%)
PCV (Percentage %)	<40	73 (63.4%)	36 (31.3%)	109 (94.78%)
	40-50	6 (5.2%)	0 (0%)	6 (5.2%)
	Total	79 (68.69%)	36 (31.3%)	115 (100.0%)

Table 3: Frequency distribution of the pharmacotherapeutic treatment

Pharmacotherapeutic Treatment	Frequency	Percentage
Epoetin Alpha	113	9.6
Darbeoetin Alpha	1	0.1
Iron Sucrose	28	2.3
Ferrous ascorbate + Folic acid + Methylcobalamin	32	2.7
Ferrous ascorbate + Folic acid	3	0.2
Ferrous Fumarate	2	0.2
Ferrous Gluconate	1	0.1
Ferrous Sulphate	1	0.1
Vit B Complex + Vit C + Zinc	4	0.3
Folic acid	2	0.2
Other comorbidity related drugs	989	84.09
Total	1176	100.0

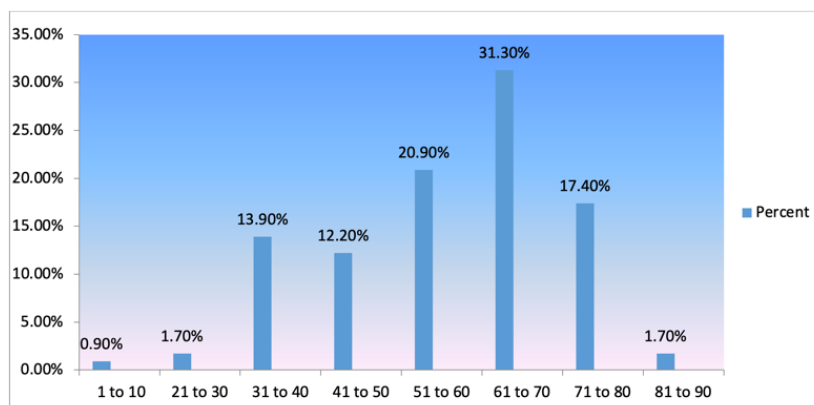


Figure 1: Distribution of subjects according to age group

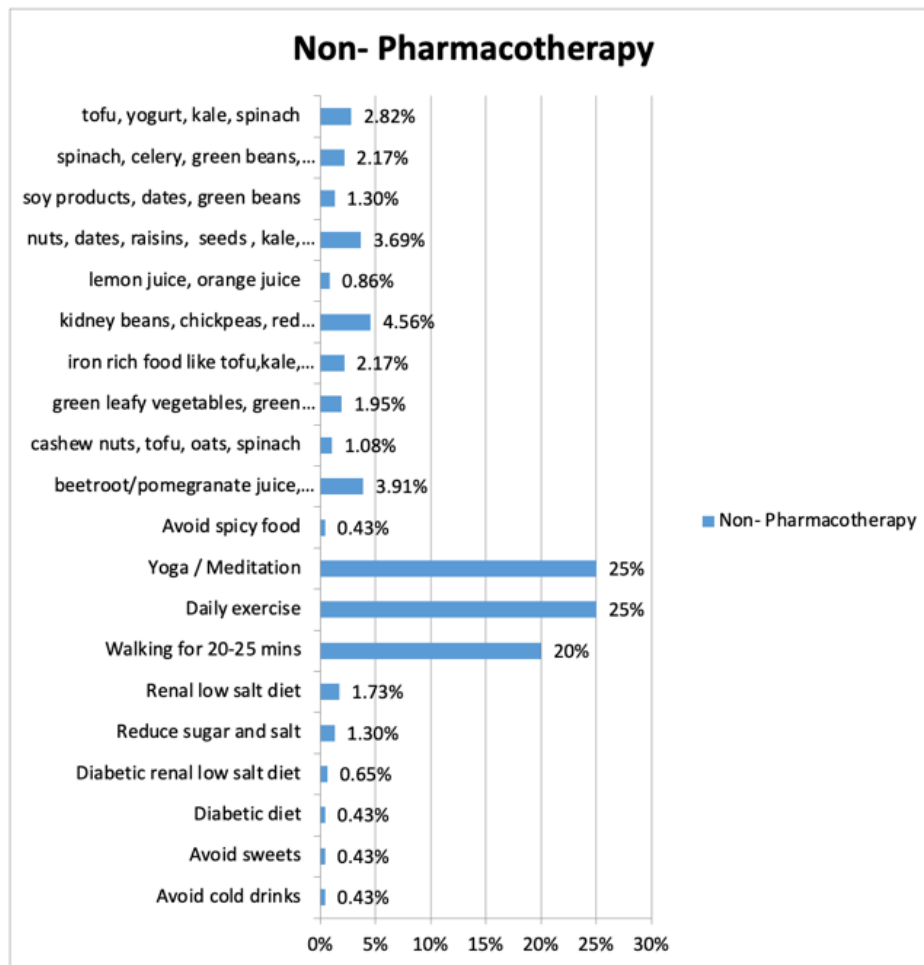


Figure 2: Frequency distribution of the non-pharmacotherapeutic treatment

RESULTS

Among 115 patients, 36 (31.3%) were female, and 79 (68.7 %) were male. In patients above 18 years of age, 58 patients belonged to the age group >60 years, contributing 50.4%, 24 patients were of the age group 51-60 years, that was 20.9%, 14 patients belonged to the age group 41-50 years that was 12.2%, and other affected age group were 31-40 years and 21-30 years giving 13.9% and 1.7% respectively. The mean age was 58.33 ± 14.45 years.

98.3% of the population had Haemoglobin <12.5g/dl, and 94.78% of people had a Packed Cell Volume of <40%. Also, all male and female subjects had ESR >20 before treatment.

From this study, out of 115 patients, 113 patients were prescribed only Epoetin Alpha, seven patients were prescribed both Epoetin Alpha and iron supplements, and moderate daily exercise along with yoga/meditation mainly was advised, along with dietary changes like the addition of iron-rich food like kidney beans, tofu, spinach, nuts etc. (4.56%).

The female gender number was 36 (31.3%), and the male gender number was 79 (68.7%). (Table 1)

98.3% of the population had Haemoglobin <12.5g/dl, and 94.78% had a Packed Cell Volume of <40%. All the subjects had ESR >20 mm/hr. (Table 2)

The subjects were prescribed various drugs to improve their haematological condition. Epoetin Alpha (9.6%) was prescribed

majorly, and the least prescribed drugs were Ferrous sulphate and ferrous gluconate, which were only 0.1% of the total population. (Table 3)

A greater number of patients were identified in the age group of 61 to 70 years (31.3%), and the least was found in the age group of 1 to 10 years (0.9%), then 21 to 30 years (1.7%) and 81 to 90 years (1.7%). (Figure 1)

Daily exercise and meditation (25%) were advised majorly, and eating nuts, tofu, oats, and spinach were suggested to only 1.08% of the subjects. Diabetic diet & renal low salt diet were subjected to 0.43% of 1.73% of patients. (Figure 2)

DISCUSSION

A higher incidence of chronic kidney disease with Anaemia and its complications was found in the age above 60 years; males are more affected than females giving 68.7% and 31.3%, respectively, as shown in Table 1. Similar findings were found in the study conducted by Livingstone Gayus Dogara *et al.*⁸, where the mean age of the participants diagnosed with Anaemia in Chronic Kidney Disease at and above 45 years of age. (45.8 ± 14.6 years).

Patients' characteristics were assessed and evaluated; the study showed that the prevalence of males was more when compared to females due to poor control of blood pressure and proteinuria. The study showed that for chronic kidney disease, more patients were identified in the age group >60 years due to diabetes, hypertension, and other comorbidities.

Males predominated over females in chronic kidney disease. Hence the prevalence of Anaemia in Chronic Kidney Disease was higher in males. Similar findings were found in a survey conducted by Livingstone Gayus Dogra⁸ and colleagues, where males were more prone to chronic kidney disease with Anaemia (74.7% males and 62.0% females).

Epoetin Alpha (9.6%) was prescribed majorly, and 8.05% of patients were prescribed both Epoetin Alpha and iron supplements, as shown in Table 3. Roberto Minutolo, *et al*⁹ also found similar results in their study.

CONCLUSION

This study was conducted to determine the prevalence of Anaemia in CKD patients, the effects of age and gender on its prevalence, and the enrolled subjects' susceptibility. The study includes the laboratory data to monitor the status before and after pharmacotherapy and non-pharmacotherapy and improve treatment recommendations in a hospital.

In our study, 115 subjects were enrolled, assessed, and evaluated for the haematological samples, pharmacotherapy, and non-pharmacotherapy.

Patients' characteristics were assessed and evaluated; the study showed that the prevalence of males was more when compared to females due to poor control of blood pressure and proteinuria; the study showed that for CKD by age, a greater number of patients were identified at the age group >60 years due to diabetes, hypertension and other comorbidities.

Patients were evaluated and diagnosed based on a few commonly observed symptoms of fatigue, shortness of breath, pallor, dizziness, malaise and tachycardia. Laboratory parameters of the patients like Hb, PCV and ESR were studied. These parameters were chosen in this study.

The patients' drug utilisation pattern was assessed. It was observed that Epoetin Alpha (9.3%) was prescribed majorly. The least prescribed drugs were Ferrous gluconate and Ferrous sulphate, which was only 0.1% of the total population and daily exercise, yoga/meditation (25%) were advised majorly as non-pharmacotherapy and consuming kidney beans, green vegetables, tofu, oats and red meat were suggested only to 4.56% of the subjects. A renal low salt diet was also advised for 0.65% of the subjects.

Based on the outcome, 95.6% of subjects recovered during hospital admission, and 4.34% did not show appropriate responses to the pharmacotherapy and non-pharmacotherapy.

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