Factors affecting anemia in end stage renal disease patients on presenting first time for dialysis to nephrologist

Muhammad Anees[1], Irfan Ilahi[1], Fazal Mateen[1], Sajjad Ahmad[1], Yasir Hussain[1], Muhammad Ibrahim[2]
[1]Department of Nephrology
King Edward Medical University, Lahore. Pakistan
[2]Department of Statistics
MAO College, Lahore, Pakistan

ABSTRACT

Objective: To determineprevalence of anemia in ESRD patients presenting first time for dialysis and factors affecting it.

Study Design: Observational descriptive study.

Place and Duration of Study: Nephrology department of King Edward Medical University / Mayo Hospital, Lahore, from January 2014 to January 2016.

Methodology: All patients presented in nephrology out patients department and with the indication for dialysis for the first time were included in study. Patients with acute kidney failure were excluded from the study. Performa was designed for demographics (age, sex,education, and income), clinical (vital signs, volume status) and laboratory data (hemoglobin, urea, creatinine, albumin, bicarbonate etc.) of all the patients.Patients were asked when they consulted the Nephrologist for first time for the kidney disease and treatment modalities likeblood transfusion, Ironpreparation and EPO for the anemia.

RESULTS

One hundred and seventy six (176) patients were enrolled in the study. Mean age of the patients was 44.70 yearsand almost equal number of the patients were male 93 (52.8 %) and female 83 (47.2 %). Most of the patients were illiterate 123 (69.6 %), and 103 (58.8%) were having income less than Rs.10000 /month. Major cause of ESRD was Hypertension 89 (50.6%), followed by Diabetes Mellitus 80 (45.5%). Mean Hb was 8.47 gm/dL and majority of the patients 155 (88.1%) were anemic, hypoalbuminemic 164 (93.2%) and acidotic 157 (89.2 %). One hundred and twenty five patients (88.7%) initiated dialysis by double lumen dialysis catheter while only 16 (11.3%) were started dialysis via arteriovenous fistula (AVF). Seventy patients were getting medical treatment when they come to know about the kidney disease and only two patients were seen by Nephrologist at that time. Almost all of the patients presented to Nephrologist just before the initiation of the dialysis. Only 27(15.3%) patients were getting EPO for anemia while rest of the patients were getting either blood transfusion or no treatment for anemia. Mean dose of the EPO was 4000IU per week only in 69(39.2%) patients.

CONCLUSION

Majority of the patients were anemic on first presentationto nephrologist for dialysis. Anemia of the CKD patients was not properly managed due to unawareness and non-affordability of the expensive treatment of anemia.
Key words: Anemia, Erythropoietin, Hemodialysis. Nephrologist.

Corresponding Author:
Dr. Muhammad Anees
Professor of Nephrology
Chairman/HOD Nephrology
King Edward Medical University, Lahore. Pakistan
Email Address. dranees109@hotmail.com
Contact No. +923008461540
DOI :10.53778/pjkd1110 PJKD 2017;1(1):8-13

INTRODUCTION

Chronic kidney disease (CKD) is defined as "abnormalities of kidney structure or function, present for more three months, with implications for Health" [1]. There are five stages of the CKD on the basis of glomerular filtration rate (GFR). As the diseases of the CKD progresses, its affects start appearing on different organs of the body. Anemia is one of the most important complication of CKD[2].Anemia is defined by World Health Organization (WHO) as a hemoglobin (Hb) concentration <13 g/dL for adult males and postmenopausal women and an Hb <12 g/dL for premenopausal women[3]. Usually most Nephrologist do not follow this definition and follow the KDIGO guidelines [4].Because lot of the studies have shown that overcorrection of anemia in these patients leads to complication in these patients.

Anemia in CKD is usually normochromic, normocytic and usually secondary to EPO deficiency. Microcytic anemia may be due to iron deficiency, aluminum excess, or certain hemoglobinopathies macrocytic anemia may be associated with B12 or folate deficiency. Anemia in CKD is usually evident when a patient's creatinine clearance (CC) is less than 30 ml/min/1.73 m2 or serum creatinine (SC) is more than 3 mg/dl. If the GFR is less than 20 ml/min or the SC of more than 5, anemia is invariably present, and the hemoglobin level is found below 10 g/dl[5]. Anemia is the leading cause of morbidity and mortality of dialysis patients[6-7].It also lowers the quality of life leading to high rate of infections and more hospitalization rate[8-9].

In Pakistan, there is paucity of the data on the issue, so this study was conducted to determine the prevalence of the anemia and factors affecting anemia in these patients.

METHODOLOGY:

All patients presenting in nephrology out patients department and having indication for dialysis for the first time, were enrolled in the study. Patients with acute kidney failure were excluded from the study. History of the disease was taken and physical examination was done. Blood samples were drawn for routine hematological (Hb), biochemical data (serum urea, creatinine, albumin, bicarbonate, calcium, phosphate, sodium and potassium) and viral markers (HBs Ag and Anti HCV). Self-designed questionnaire was used for demographics (age, education, gender, marital status and monthly income), clinical and laboratory data. Normal and abnormal lab parameters were decided according to KDIGO guidelines[1].Patients were asked about seeking nephrology services at the initiation of the disease and later on. Patients, who were not having permanent access for dialysis, were dialyzed through temporary catheter.

Data was entered using SPSS version 21.0. Continuous variables were expressed as Mean ± SD. Categorical variables were presented as frequencies. Chi-square was used to determine any association between variables. P value was considered less than 0.05 as significant.

RESULTS

One hundred and seventy six(176) patients were enrolled in the study. Mean age of the patients was 44.70 years and majority of the patients 84 (47.7 %) were in middle age group(30-50 years).Almost equal number of the patients were male 93 (52.8 %) and female83 (47.2 %). Mostof the patients were illiterate 123 (69.6 %), and103 (58.8%) were having income less than Rs.10000 /month. Major cause of ESRD was Hypertension89 (50.6%), followed byDiabetes Mellitus80 (45.5%).Mean Hb was 8.47 gm/dL and majority of the patients 155 (88.1%) were anemic, hypoalbuminemic 164 (93.2%) and acidotic 157 (89.2 %).One hundred and twenty five patients (88.7%) initiated dialysis by double lumen dialysis catheter while only 16 (11.3%) were started dialysis via arteriovenous fistula (AVF).Laboratory of the patients is shown in **Table No.1**.Seventy patients were getting medical treatment when they come to

know about the kidney disease and only two patients were seen by Nephrologist at that time. Almost all of the patients presented to Nephrologist just before the initiation of the dialysis. Only 27(15.3%) patients were getting EPO for anemia while rest of the patients were getting either blood transfusion or no treatment for anemia. There was no statistical difference found between both groups (p>0.05).

Table.No.1: Laboratory data of ESRD patients presenting first time for dialysis

S.No	Parameters	Mean± SD
1	Hemoglobin(gm/dl)	8.48± 1.7
2	Serum Albumin(gm/dl)	2.93± 0.72
3	Seum Sodium (138.39mmol/L)	138.39± 9.0
4	Serum Potassium (mmol/L)	4.8± 0.90
5	Serum Urea (mg/dl)	275± 18.5
6	Serum Creatinine (mg/dl)	11.25± 4.4
7	Serum Calcium phosphorus product	57.0± 5.4

DISSCUSION

The association of chronic kidney disease (CKD) and anemia has been recognized since the early 19th century, first noted by Richard Bright in 1836 when he observed pallor in the development of Bright's disease[10].In this study almost all of the patients were anemic like other studies conducted locally and internationally[11]. There are multiple reason for such a high prevalence of anemia in these patients. There is deficiency of Nephrologist in Pakistan and kidney patients are being managed by non-renal physicians till the need of dialysis[12]. As most of the non-renal physicians are not well versed about the treatment guideline of the KDIGO regarding anemia management [13]. It has been observed that patients who were taking EPO, before starting it no proper workup like iron studies, serum folic acid and Vitamin B12 was done in these patients.

In Pakistan, people have misconceptions about the dialysis and they think dialysis mean death. It has been observed that seventy percent of the patients refuse dialysis in Mayo Hospital and they wish to continue conservative treatment[14]. These patients opt for treatment options like herbal, spiritual and homeopathic modalities. These patients later on present with advanced complications like severe anemia, metabolic acidosis and malnutrition. This high prevalence of anemia is a risk factor for cardiac complications leading to high morbidity and mortality of the ESRD patients.

The use of erythropoiesis-stimulating agents (ESAs) for treatment of anemia in CKD, their efficacy in raising hemoglobin (Hb), reducing the need for red blood cell (RBC) transfusion, and improving symptoms has been established in guidelines[15-16]. In this studyonly few CKD patients are getting EPO for anemia management. These patients were managing anemia and they were either not getting any treatment or multiple blood transfusions foranemia. As the data shows that most of the patients belong to poor socioeconomic background and cannot afford expensive treatment in the form of either iron or EPO. The cost of the EPO according to standard dose is Rs. 12000/ per month.Even the patients who were getting EPO, they were getting under dose of the EPO as compared to international data. EPO therapy is being sponsored by government of the Punjab just for in center hemodialysis patients at public hemodialysis center in the province. No free of cost therapy or such program is for pre ESRD patients at the time of writing, in practice. There is need of awareness about anemia in CKD and its

timely management. Hazards of transfusion and seroconversion by transfusion, as most of time viral screening is done by rapid kit method, should be educated at community level.

Table.No.2. Treatment of the anemia of the CKD patients

S.No		N (%)
1	**Treatment Modality**	
	Blood transfusion	67(38.1%)
	EPO Treatment	27(15.3%)
	Both	43(24.4%)
	No Transfusion	39(22.2%)
2	**Number of Blood Transfusion**	
	Less than 2 times	31(17.6%)
	2-4 blood transfusions	68(38.6%)
	More than 4 transfusions	14(8.0%)
3	**Dose of EPO**	
	2000IU/week	6(3.4%)
	4000IU/week	69(39.2%)
	None	101(57.4%)

Blood transfusion was one of most preferred treatment for anemia observed in this study. Important factors for this preference were lack of knowledge about anemia in CKD in both patients as well as treating non-renal physicians. Transfusions is seemed to be cheaper and easy treatment as mostly it is freely available or donated by close relatives. Also blood transfusion is believed to be repeated less frequently. Blood transfusion are sometimes needed for rapid anemia correction as for surgery or gastrointestinal/ per vaginal bleed. Most of the doctors are opting it because of poor knowledge of anemia in CKD and finding transfusion as best available, less costly treatment.

It is also common practice to prescribe blood transfusion to ensure patients and attendants that CKD is an end of life disease. Despite in the advancement in the treatment of anemia, most of the patients cannot afford anemia treatment as most of them belong to poor socioeconomic class as observed in this study.

Level of Hb had strong effect on number and frequency of transfusion, as kidney disease advanced the number and frequency of transfusion were more, high lightening the fact of worsening of anemia and its management as disease progressed. This observation was similar to an international study where number of blood transfusion were more when Hb was below 10 gm/dl[16-17].

Iron deficiency is most important cause of anemia and is of multifactorial. It may be secondary to poor nutrition, loss of appetite, uremic gastritis, infection, inflammation and ongoing blood loss. In this study majority of patients were not getting either oral or intravenous iron which seemed to be secondary to poor buying capacity, unawareness of iron rule in anemia treatment and fear of anaphylactic reactions.

CONCLUSION

Majority of the patients were anemic on first presentation to nephrologist for dialysis. Anemia of the CKD patients was not properly managed due to unawareness and non-affordability of the expensive treatment of anemia.

DISCLOSURE

All the authors declared no conflict of interest.

REFERRENCES

1. Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 clinical practice guideline for the evaluation and management of chronic kidney disease. Kidney Int Suppl. 2013; 3:1-150.

2. Center for Disease control and prevention. Prevalence of chronic kidney disease and associated factors-United States,1999-2004. MMWR Rep.2007; 56(8):161-5

3. World Health Organization. Nutritional Anemias: Report of a WHO Scientific Group. Geneva, Switzerland: World Health Organization, 1968.

4. KDIGO Clinical practice guidelines for anemia in chronic kidney disease. Kidney Int Suppl.2012.2;4 :(2012) 2,279; doi:10.1038/kisup.2012.37

5. Lee GR. The anemias associates with renal disease, liver disease, endocrine disease, and pregnancy. In: Lee GR, Foester J, Lekuns J, Paraskevas F, Greer JP, Rodgers GM, eds. Wintrobe clinical hematology. 10th ed. Baltimore: Williams & Wilkins Awalverly Co.; 1999. p. 1497-517)

6. Astor BC, Coresh J, Heiss G, Pettitt D, Sarnak MJ: Kidney function and anemia as risk factors for coronary heart disease and mortality: The Atherosclerosis Risk in Communities (ARIC) study.Am Heart J151: 492–500, 2006).

7. M Anees, M Ibrahim, Anemia and Hypoalbuminemia at initiation of hemodialysis is a risk factor for survival of dialysis patients. JCPSP 2009. Vol 19 (12) 778-780.

8. Perlman R, Finkelstein F, Liu L, Roys E: Quality of life inchronic kidney disease (CKD): A cross-sectional analysis in the Renal Research Institute–CKD study. Am J Kidney Dis 45: 658 – 666, 2005).

9. Perlman R, Finkelstein F, Liu L, Roys E: Quality of life inchronic kidney disease (CKD): A cross-sectional analysis in the Renal Research Institute–CKD study. Am J Kidney Dis 45: 658 – 666,2005.

10. Remuzzi G, Rossi Ec. Hematologic consequences of renal failure. In: Brenner BM, Ed. The kidney. 5th ed. Philadelphia:WB Saunders Co; 1995. p. 2170-85.

11. Anees M, A Mumtaz, Nazeer M, Ibrahim M, S M Rizwan and T Kausar, Referral pattern of hemodialysis patients to nephrologists.JCPSP 2007; 17 (11):671-674.

12. Obarador GT, Ruthanzer R, Arora P, Kausaz AT, Perrira BJ. Prevalence of and factors

associated with suboptimal care before initiation of dialysis in United States. J Am Soc Nephrol.1999; 10(8): 1793-800.

13. Anees M, Ibrahim M, SZAdhmi, and Nazir M. Comparison of awareness about nephrology and kidney diseases amongst doctors in institutes with and without nephrology departments.Pak J Med Sci. 2014; 30(4): 891-894.

14. AneesM, J Khan, A Basit, M Ibrahim, A Mumtaz. Refusal of dialysis amongst patients of Chronic Kidney Disease(CKD). Annals of KEMU 2014. 20(3): 228-232.

15. Leaf DE, Goldfarb DS: Interpretation and review of health related quality of life data in CKD patients receiving treatment for anemia. Kidney Int75: 15–24, 2008.

16. National Kidney Foundation: K/DOQI Clinical Practice Guidelines for Anemia of Chronic Kidney Disease, 2006. Am J Kidney Dis47[Suppl 3]: S11–S145, 2006.

17. Elizabeth V. Lawler et al Transfusion Burden among Patients with Chronic Kidney Disease and Anemia.Clin J Am Soc Nephrol 5: 667– 672, 2010