

Chronic kidney disease 5 on hemodialysis in Nepal Medical College Teaching Hospital

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ABSTRACT

Chronic Kidney Disease (CKD) 5 is defined when glomerular filtration rate (GFR) is $<15.0\text{ml}/\text{min}/1.73\text{m}^2$. Though nephrology service was started in Nepal as early as in 1970, we do not have data regarding CKD 5 patients till date. So this study is being undertaken to know the epidemiological profile and etiology of CKD 5 patients attending hemodialysis (HD) unit of Nepal Medical College Teaching Hospital. This is a prospective study which was carried out in HD unit over a period of one year. CKD 5 patients having GFR of $<15\text{ml}/\text{min}/1.73\text{m}^2$ under HD were included in the study. Among 100 patients included in the study 57 were male and mean age of the study population was 46.9 ± 17.9 years. Most common cause of CKD 5 in the study was hypertension (54.0%); other causes included diabetic nephropathy (18.0%), idiopathic (13.0%) and glomerulonephritis (6.0%). Fifty percent of patients were from outside Kathmandu Valley. Around 20.0% of the study population is on regular follow up while 45.0% were lost to follow up. Twenty percent of the patient underwent transplantation and 15.0% of the study population died. Majority of patients were anemic (85.0%). Correction of anemia was done with blood transfusion in 88.0% and only 12.0% received erythropoietin. Hypertension was the leading cause of CKD 5; majority of patients (45.0%) discontinued hemodialysis most probably due to economical constrain; blood transfusion was the main modality of treatment of anemia.

Keywords: Anaemia, chronic kidney disease 5, hemodialysis, nephropathy.

INTRODUCTION

Chronic Kidney disease (CKD) is defined as kidney damage or glomerular filtration rate (GFR) $<60.0\text{ml}/\text{min}/1.73\text{m}^2$ for three months or more irrespective of the cause.¹ CKD 5 is defined when GFR is $<15.0\text{ml}/\text{min}/1.73\text{m}^2$.²

Exact incidence and prevalence of CKD in a community is difficult to know due to asymptomatic nature of early stages of CKD. In fact CKD patients are increasing in number day by day. Nephrology service in Nepal was started by an eminent nephrologist of Nepal late Dr. P. R. Satyal in early 1970s, but hemodialysis (HD) service in Nepal was started only in 1987 in Bir Hospital (National Academy for Medical Sciences).³ In Nepal Medical College Teaching Hospital (NMCTH) HD service is available since 2005.

HD is usually carried out for 12-14 hours a week. HD can maintain the life of a patient to near normal. The largest number (around 2, 19,813 in 2001) of end stage kidney disease (ESKD) patients are maintained on maintenance hemodialysis (MHD) in Japan.⁴ Similarly in US also the no. of population with ESKD is more than 200,000.⁵ The exact no. of patients on MHD worldwide is not known. Likewise, data from developing countries like ours are scarce. We do not have our own data till date. In this context we would like to present our experience about CKD 5 in NMCTH with an aim to know the epidemiological profile and etiology of CKD 5 patients.

MATERIALS AND METHODS

This is a prospective study carried out in Hemodialysis (HD) unit of NMCTH over a period of one year (Baishakh 2063 to Chaitra 2063). Consecutive patients attending HD unit who met the inclusion criteria were enrolled for the study. Cockcroft-Gault equation was used in most of the patients for estimation of creatinine clearance. Baseline blood investigations such as hemoglobin, blood urea, serum creatinine, serum sodium (Na^+) and potassium (K^+), HBsAg, Anti HCV and HIV I and II were sent in all the patients. The inclusion criteria was CKD patients with GFR $<15.0\text{ ml}/\text{min}/1.73\text{m}^2$. Patients with acute renal failure and CKD 5 patients not on hemodialysis were excluded from the study.

RESULTS

During the study period one hundred patients were included in the study. Fifty seven were male and 43 were female. Age ranged from 20 to 80 years (Fig. 1). Average age of the study population was 46.9 ± 17.9 years. Eighty percent of patients were between the ages of 20-60 years. Fifty percent of the patients were from the Kathmandu Valley.

Baseline hemoglobin, blood urea, serum creatinine, serum sodium (Na^+) and potassium (K^+) of the study population is as shown in the table-1. This blood picture shows that CKD patients present late for the management.



Fig. 1. Distribution of CKD 5 patients according to age group

Hypertension (HTN) was the leading cause of CKD 5 (54.0%) followed by diabetes mellitus (18.0%), idiopathic (13.0%) and glomerulonephritis (GN) (6.0%). Other causes of CKD 5 were obstructive uropathy (5.0%), reflux nephropathy (2.0%) and autosomal dominant polycystic kidney disease (ADPKD) (2.0%) (Fig 2).

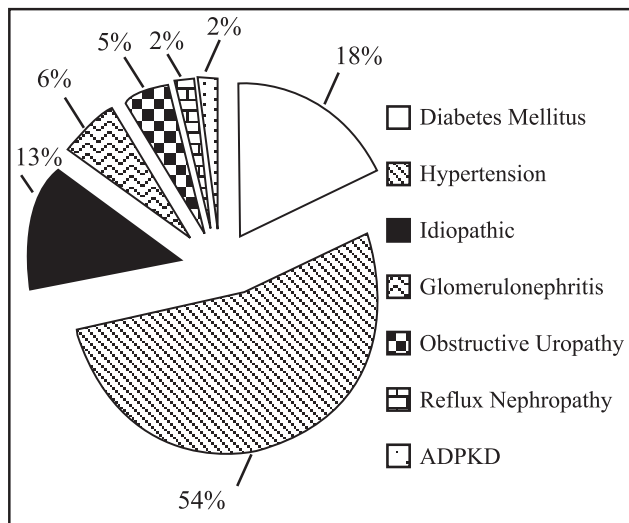


Fig. 2. Causes of CKD 5 patients on hemodialysis

Anemia was present in 85.0% of the population. In 88.0% of the anemic patients blood was transfused to correct anemia and only 12.0% of the anemic patients were able to use erythropoietin.

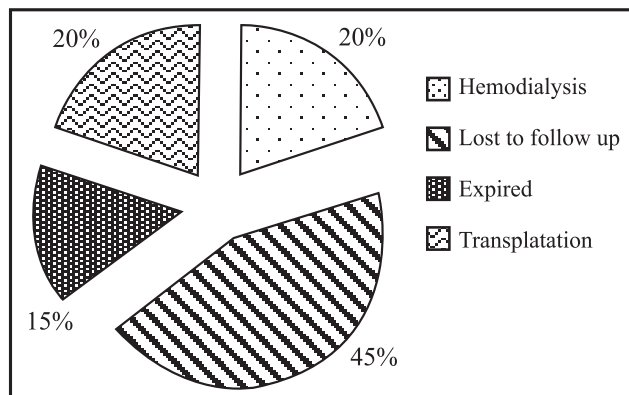


Fig. 3. Outcome of CKD 5 patients on hemodialysis

Twenty percent of patients underwent kidney transplantation. Most of the patients (45.0%) lost to follow up. Around 20.0% of patients are on regular hemodialysis. Fifteen percent of patients died (Fig. 3).

Table-1: Baseline blood parameters of study population

	Mean	SD
Hemoglobin (gm/dL)	7.2	2.1
Urea (mg/dL)	209.7	112.9
Creatinine (mg/dL)	10.9	5.24
Sodium (mmol/L)	129.2	10.1
Potassium (mmol/L)	4.8	0.9

DISCUSSION

Out of 100 patients 57.0% were male which shows male dominance in seeking treatment in our part of the world. In our study majority of patients were less than 60 years old. In developed world mean age of CKD 5 leading to End Stage Kidney Disease (ESKD) is between 60-63 years. In our study average age of presentation was around 46 years which is similar to median age of 43 years old in India.^{6,7} This obviously show the lack of care of primary disease leading to CKD, lack of screening for CKD patients in early stages and to adopt preventable measures in our country. This study also shows that patients seek medical management late in the course of the disease which is evident from the baseline blood parameters like Hb level of 7.2gm%, urea 209.76 mg/dL, creatinine 10.95 mg/dL and Na⁺ 129.27 mmol/L.

This study showed hypertension as a leading cause of CKD where as in previous study from Nepal chronic glomerular disease was most common cause of chronic renal failure (36.0%) while HTN was 29.0%, diabetes mellitus was 9.0%, obstructive uropathy was 11.0% and ADPKD 2.0%.⁸ Studies from neighboring country India show Diabetes⁹ and Chronic GN^{6,7,10} as leading causes. This could be because of small number of patients and referral center based study. Again in our study number of patients of GN may increase if we could have more facilities for diagnosis and if patients would have presented early when renal biopsy could have been performed. If we go to the community the scenario of this etiology may differ.

Anemia is an important complication of chronic disease which is very common in patients with CKD. There are many factors which contribute to anemia and one of them is lack of erythropoietin. Anemia is also responsible for the reduced quality of life of CKD patients, development of left ventricular hypertrophy and exacerbation of left

ventricular dilatation. So the correction of anemia is very important as it reverses most of the cardiovascular abnormalities. It also improves quality of life, sleep pattern, nutrition, sexual function, menstrual regularities, immune responsiveness and platelet function.^{11,12} In our study around 85.0% were anemic with average hemoglobin level of 7.2gm%. In western countries correction of anemia is done with erythropoietin only¹³ but in Nepal as shown by this study it done mainly with blood transfusion. In our center we are generally using fresh packed red cells for the correction. Financial constrain is the main barrier for less use of erythropoietin in our country.

Forty five percent of patients lost to follow up mainly because of financial problem. Some patients were shifted to other nearby HD centers inside and outside the valley. Only 20.0% of the patients were able to continue twice a week hemodialysis in our center. In Nepal patients are put on twice a week dialysis mainly because of the cost which the patients cannot afford. In Pakistan also 75.0% of the patients are on twice a week dialysis.¹⁴ In one study from Nepal, 60.0% of the patients dropped out from the dialysis by 2nd month mainly because they could not afford the dialysis and only 22.0% afforded to continue MHD.⁸ In India also about 60.0% are lost to follow up within three months, primarily due to economic reasons.¹⁵

Lack of financial support from government is one of the major factors for drop out from hemodialysis program.

Though patient can be maintained in MHD for a long time after renal transplant patient can lead a near normal and independent life.¹⁶ Even though transplantation is the best modality of renal replacement therapy worldwide¹⁷, only 20.0% of our patients were able to enjoy this facility. Lack of kidney transplantation service in the native country and expensive cost per and post transplantation could be the major contributors to less number of kidney transplantation. Due to irregular and missed hemodialysis 15.0% of the patient expired.

Almost half of the patients were from out side the Kathmandu Valley. Almost all nephrologists are based in Kathmandu and most of the renal centers are also inside Kathmandu, patients from out of Kathmandu Valley who are in need of renal services are bound to come to the valley for further management. This really is a problem for patients coming from remote places of the country. This would increase the cost of therapy to

them. This is also an important cause of discontinuation of treatment which is clearly shown by the fact of large numbers of patients being lost to follow up in our study.

ACKNOWLEDGEMENTS

We are grateful to house officers and dialysis nurses for helping us to prepare this manuscript.

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