

Pattern of End Stage Renal Disease in a Tertiary Care Center

Khakurel S,¹ Agrawal RK,¹ Hada R¹

¹Nephrology Unit, National Academy of Medical Sciences, Bir Hospital, Kathmandu, Nepal

ABSTRACT

Introduction: End Stage renal disease (ESRD) is a major public health problem across the world and it is rising. The incidence prevalence and causes of ESRD is not known in Nepal. With a population of 27 million people the estimated incidence of ESRD is around 2700/year if we take 100/million population at par with India and Pakistan. However majority of patients do not reach hospitals with dialysis facilities. The aim of the present study was to analyze the clinico-epidemiological profile of ESRD in the Nepalese context.

Methods: A retrospective, cross sectional study was conducted on newly diagnosed ESRD patients within five years in a tertiary care center. Their demographic profile, etiology and follow up were studied.

Results: The mean age of the patients was 42 years, male to female ratio being 1.7:1. Chronic glomerulonephritis (41%) was the leading cause of ESRD, followed by diabetic nephropathy (16.8%) and hypertensive nephrosclerosis (13.7%). Unexplained renal failure constituted 18% of our cases. Intermittent peritoneal dialysis (IPD) remained the initial mode of therapy due to easy accessibility. Most of the patients dropped out after having single session of IPD. Others went for repeat sessions of IPD or haemodialysis. Out of the 23.6% who went for haemodialysis only 13% could continue dialysis for more than three months and 3.8% could go to neighboring country for renal transplantation.

Conclusions: CGN is the leading cause of ESRD followed by diabetic nephropathy and hypertension. It affected younger age group people. ESRD treatment is costly and unaffordable by most Nepalese people. Stress should be given to the health education and screening programme for prevention and early detection of CKD.

Key Words: *end stage renal disease, intermittent peritoneal dialysis, Nepal*

INTRODUCTION

Chronic Kidney Disease (CKD) is a public health problem across the world and it is rising. According to United States Renal Data System (USRDS) the incidence of end stage renal disease (ESRD) has gone up in US from 249/

million population in 1992 to 337/million population in 2003.¹ The estimated incidence of ESRD in India and Pakistan is 100/million population/year.² However, recent population-based study in India showed it to be around 232/million population.³

Correspondence:

Dr. Sudha Khakurel
National Academy of Medical Sciences, Kathmandu, Nepal
Email: s.khakurel@hotmail.com
Phone: 9851082128

The prevalence of ESRD increases as the economy of the country grows with more people seeking renal replacement therapy. Prevalence is highest in Japan at 2000/ million and only 100/ million in India.⁴ The incidence and prevalence of ESRD has not been studied in Nepal. The objective of the present study is to find out the clinical and epidemiological profile and problems of ESRD management in the Nepalese context.

METHODS

A retrospective cross sectional study of all ESRD patients (creatinine clearance <15 ml/min) admitted in Bir hospital from April 2001-April 2006 were done. Ethical approval and hospital permission was taken. The hospital records were reviewed. Acute and acute on chronic renal failure were excluded by the history, physical examination with exclusion of reversible factors like infection, dehydration, nephrotoxic drugs, investigations including ultra sonogram of abdomen (USG) showing normal kidneys and hydronephrosis without thinning of cortex, reversibility on treatment and follow up. Each patient was counted only once as a new ESRD despite of several admission for different problems. Different etiological diagnosis was reached from history, examination, investigations including urine analysis, haematological tests, biochemical parameters, radiological investigations including USG abdomen, X ray chest and X ray KUB. Creatinine clearance was calculated by Cockcroft and Gault formula. Electrocardiogram (ECG) was done in all cases and echocardiography was done in selected cases. Doppler USG and angiogram was done in cases with ischemic renal disease. Mode of treatment and outcome was computed. Population on maintenance haemodialysis (MHD) in Bir hospital and other centers were followed up. Statistical analysis was done by statistical package for social science version 13 for windows.

RESULTS

Total number of ESRD patients during the period was 802 of which 510 were male and 292 were female with male to female ratio of 1.7:1. The mean age of patients was 46 years (range 2-96 years) with 66.3% patients in the age group 20-59 years. Annual number and age group of ESRD patients during study period is given in Table 1. On an average 13 new ESRD patients are enrolled monthly.

Chronic glomerulonephritis is the leading cause of ESRD followed by diabetic nephropathy and hypertensive nephrosclerosis (Table 2). Uncommon causes were chronic tubulointerstitial nephritis, ischaemic renal disease and chronic allograft nephropathy. In 18.1% patients the cause of ESRD could not be ascertained. The major cause of obstructive uropathy was

nephrolithiasis (53.1%) followed by neurogenic bladder (15.6%), posterior urethral valve (6.2%), stricture urethra (3.1%), phimosis (3.1%), benign enlargement of prostate (3.1%) and causes unidentified (15.6%). Three out of the five cases of neurogenic bladder were due to spinal injury. Ischaemic renal disease was due to atherosclerosis in one case and Takayasu's arteritis in another.

The mean age varied with different diseases being low in chronic glomerulonephritis and chronic pyelonephritis and higher in diabetic nephropathy, hypertensive nephrosclerosis and ADPKD (Figure 1). Chronic glomerulonephritis was the commonest cause of ESRD in all age groups below 60 years while diabetic nephropathy was the commonest cause in age group 60-79 years (Table 2).

Presenting features were uraemic symptoms (65.8%), uraemic encephalopathy (3.7%), fluid overload (15.3%), acidosis (5.3%), oliguria (10%), swelling of the body (7.8%), generalized weakness (5%), epistaxis (3.4%), pruritus (1.5%), chest pain and haemoptysis (0.9%) and muscle cramp (0.6%).

Biochemical investigations revealed blood urea 190 ± 67 mg %, serum creatinine 10.6 ± 8.7 mg%, serum sodium 134.7 ± 11 meq /L and serum K 5.0 ± 3.0 meq/L, serum calcium 8.1 ± 1.2 mg % and serum phosphorous 6.6 ± 2.8 mg%. Mean Hb was 7.3 ± 1.7 gm/dl.

Intermittent peritoneal dialysis (IPD) was the initial mode of therapy in 68% which was followed by haemodialysis in 9.6% cases. Out of the patients receiving peritoneal dialysis 86.1% received only one session, 10.3% received 2 sessions, 3.6% received more than 2 sessions. Haemodialysis was the initial mode of treatment in 14% cases. Only conservative treatment was received by 17.6% cases, some of whom were in stage V CKD with severe anaemia and others refused dialysis due to financial reasons. Continuous ambulatory peritoneal dialysis was least popular due to its high cost and received by only two cases (0.24%). Out of 23.6 % cases receiving haemodialysis, 5.1 % had only few sessions, 5.2% had dialysis for less than three months and only 13.3% cases could continue MHD for more than three months. Kidney transplant which was not available in the country was done in neighboring country in only 3.8% of cases.

Blood transfusion for anemia was the mode of therapy in 93 % cases and only 3.4% could afford erythropoietin. Hypertension was present in 83.6%, which was controlled on one drug in 39.8%, two drugs in 30.6%, three drugs in 12.1% and four drugs in 1.1% patients. 14.7% patients expired during hospital admission.

Table 1. Annual ESRD patients according to age group (Years)

Year	Age (Years)					Total
	< 20	20-39	40-59	60-79	> 79	
2001/2002	7	32	42	18	3	102 (12.7%)
2002/2003	4	39	59	40	8	150 (18.7%)
2003/2004	8	71	58	49	3	189 (23.6%)
2004/2005	14	71	52	43	3	183 (22.8%)
2005/2006	20	48	59	46	5	178 (22.2%)
Total	53 (6.6%)	261 (32.5%)	270 (33.7%)	196 (24.5%)	22 (2.7%)	802 (100%)

Table 2. Aetiology of ESRD within different age groups (Years)

Diagnosis	Total number and percentage of cases within age groups (Years)					Total
	< 20	20-39	40-59	60-79	> 79	
Chronic glomerulonephritis (CGN)	35 (66%)	157 (60.2%)	97 (35.9%)	31 (15.8%)	6 (27.3%)	326 (40.6%)
Diabetic Nephropathy (DN)	0	12 (4.6%)	55 (20.4%)	63 (32.1%)	5 (22.7%)	135 (16.8%)
Hypertensive Nephrosclerosis (HTN)	0	12 (4.6%)	51 (18.9%)	40 (20.4%)	7 (31.8%)	110 (13.7%)
Obstructive Uropathy (OBS)	3 (5.7%)	10 (3.8%)	10 (3.7%)	9 (4.6%)	0	32 (4%)
Autosomal dominant polycystic kidney disease (ADPKD)	0	2 (0.8%)	9 (3.3%)	6 (3.1%)	1 (4.5%)	18 (2.2%)
Chronic pyelonephritis (CPN)	5 (9.4%)	8 (3.1%)	4 (1.5%)	3 (1.5%)	0	20 (2.5%)
Chronic tubulointerstitial nephritis (CTIN)	1 (1.9%)	0	3 (1.1%)	3 (1.5%)	0	7 (0.9%)
Chronic allograft nephropathy (CAN)	0	1 (0.4%)	3 (1.1%)	1 (0.5%)	0	5 (0.6%)
Rapidly progressive glomerulonephritis (RPGN)	1 (1.9%)	1 (0.4%)	0	1 (0.5%)	0	3 (0.4%)
Ischaemic renal disease (IRD)	0	1 (0.4%)	0	1 (0.5%)	0	2 (0.2%)
Unexplained causes (UNX)	8 (15.1%)	57 (21.8%)	38 (14.1%)	38 (19.4%)	3 (13.6%)	144 (18%)
Total	53 (100%)	261 (100%)	270 (100%)	196 (100%)	22 (100%)	802 (100%)

DISCUSSION

The cause of end stage renal disease varies in different part of the world with diabetic nephropathy being the leading cause worldwide. The number of diabetic ESRD population is increasing⁵ as diabetes is on the rise and people with diabetes are living longer. Diabetic nephropathy now accounts for 44% of all new ESRD in US.¹ CGN is a leading cause of ESRD in developing

countries like India, Pakistan and Bangladesh^{2,6,7} although recent population based study in India³ had shown diabetic nephropathy as the leading cause of ESRD. Present study also has shown CGN as the commonest cause of ESRD followed by diabetic nephropathy and hypertension. Most of our patients presented very late in the disease and hence the cause could not be ascertained in 18% cases. Chronic pyelonephritis that constituted 2.5% of our cases was probably under diagnosed. The

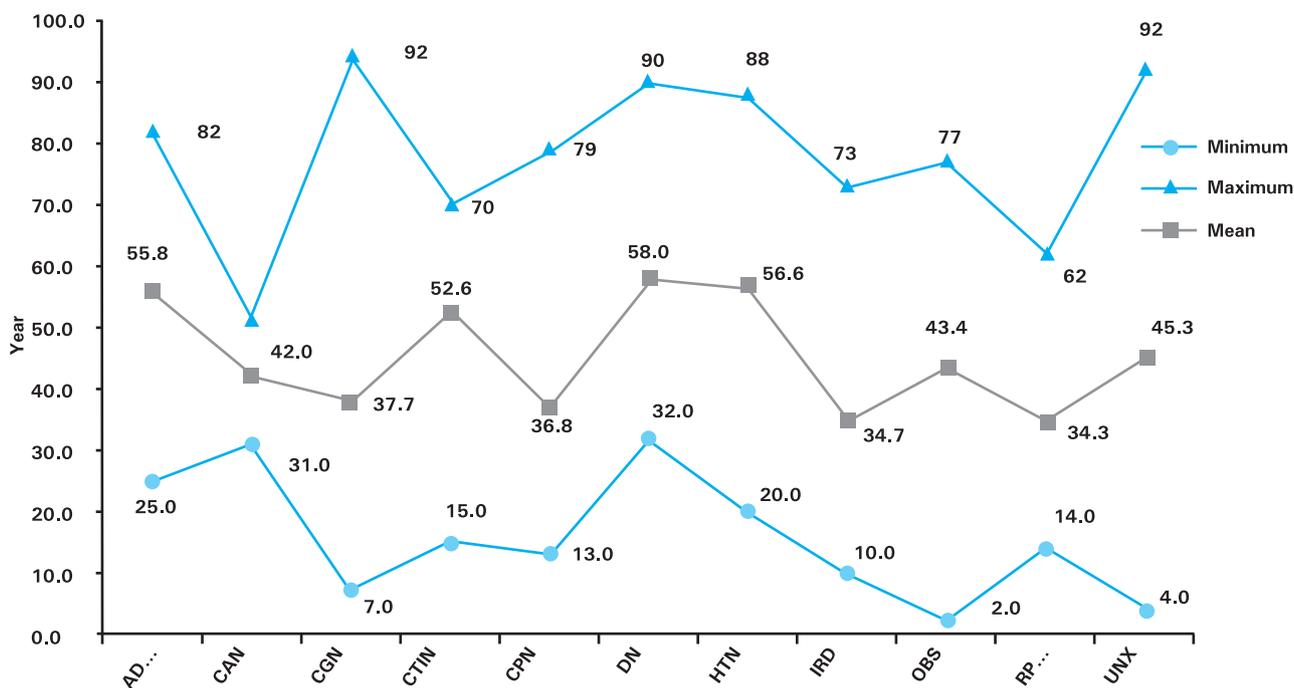


Figure 1. Mean age (years) of patients with different diseases

mean age of the patients with ESRD was younger with two third of all cases in 20-60 age group compared to developed countries where the elderly ESRD population is increasing.⁸ Most patients could not afford the cost of erythropoietin and hence blood transfusion was the mode of therapy. Intermittent peritoneal dialysis, which has largely been replaced by CAPD in most developed countries, is still being practiced for treatment of ESRD in some developing countries.⁹ It remained the initial mode of therapy in majority of cases because it was easily accessible and haemodialysis machines were few in number. Most patients could afford only one or two sessions of IPD and succumbed to death. Some patients had repeated IPD whenever they became symptomatic. Those who could continue dialysis went for maintenance haemodialysis. Hardly few could continue MHD because of the high cost of dialysis. Acceptance to renal replacement therapy has been low in developing countries like Bangladesh where one third abandon treatment within the first three months and out of the remaining patients 10% go for renal transplant.⁷ Similarly review article by Sakhujia et al has shown that less than 10% of all patients in India and Pakistan receive any kind of renal replacement therapy as majority of patients starting dialysis stop treatment within the first three months due to financial constraints and only 5% go for renal transplant.² High dropout rate of 57% after few sessions of haemodialysis has been reported at B.P. Koirala Institute of Health Sciences in eastern Nepal.¹⁰

Nephrology service is limited to Kathmandu valley and a few other centers outside valley. The cost of twice weekly dialysis is \$160 per month in Government hospital and \$320 per month in non-government sector. Government hospital cannot provide dialysis for all and there is long waiting list for dialysis. Even in the government hospitals only service is provided at a nominal cost and patients have to buy the consumable items for dialysis. There is as yet no insurance policy for health services. Nepal being a country with a poor socioeconomic status with per capita income of \$270 per year most Nepalese cannot afford to have maintenance dialysis. Only a handful could go to neighboring country like India for renal transplantation.

CONCLUSIONS

CGN is the leading cause of ESRD in our context followed by diabetic nephropathy and hypertensive nephrosclerosis. It affects younger age group people in their productive life. Most of the disease could have been prevented through screening programme. ESRD treatment is costly, not available in most parts of the country and unaffordable by most Nepalese people. This highlights the need for health education for prevention and early detection of chronic kidney disease. There should be health insurance policy and easy accessibility to dialysis facilities at subsidized cost. Renal transplantation would cut down the cost on dialysis and improve quality of life.

REFERENCES

1. United State Renal Data System. USRDS 2004 ADR/Atlas [Online]. 2004 [cited 2009 Jan 20]; Available from: URL: http://www.usrds.org/atlas_2004.htm
2. Sakhuja V, Sud K. End-stage renal disease in India and Pakistan: burden of disease and management issues. *Kidney Int Suppl.* 2003;83:S115-8.
3. Modi GK, Jha V. The incidence of end-stage renal disease in India: a population-based study. *Kidney Int.* 2006;70(12):2131-3.
4. Barosum RS. Chronic Kidney Disease in the Developing World. *N Engl J Med.* 2006;354:997-9.
5. Steward JH, McCreddie MR, Williams SM, et al. Trends in incidence of treated end stage renal disease, overall and by primary renal disease, in persons aged 20-64 years in Europe, Canada and Asia Pacific region,1998-2002. *Nephrology.* 2007;12(5):520-7.
6. Naqvi SAJ. Nephrology Service in Pakistan. *Nephrol Dial Transplant.* 2000;15:769-71.
7. Rashid HU. Health Delivery System for Renal Disease Care in Bangladesh. *Saudi J kidney Dis and Transplant.* 2004;15(2):185-9.
8. Wakai K, Nakai S, Kikuchi K, et al. Trends in incidence of end-stage renal disease in Japan, 1983-2000: age adjusted and age specific rates by gender and cause. *Nephrol Dial Transplant.* 2004;19:2044-52.
9. Jha V, Chugh KS. The Practice of Dialysis in the Developing Countries. *Hemodialysis International.* 2003;7(3):239-49.
10. Sharma SK, Kumar P, Chapagain A, et al. Haemodialysis in B.P. Koirala Institute Of Health Sciences,Dharan- An Initial Experience. *J Nepal Med Assoc.* 2001;40:134-38.