HAEMODIALYSIS IN B. P. KOIRALA INSTITUTE OF HEALTH SCIENCES, DHARAN - AN INITIAL EXPERIENCE

Sharma S K¹, Kumar P², Chapagain A³, Koirala S⁴

ABSTRACT

Dialysis supports life, in spite of complete cessation of renal functions. Haemodialysis (HD) service became available in B. P. Koirala Institute of Health Sciences, Dharan since September 1999. Six hundred and sixty one sessions of HD in 50 patients were carried out in one year. End stage renal disease (ESRD), acute renal failure (ARF), acute on chronic renal failure constituted 54%, 26% and 20% of the patients respectively. Majority of the patients (72%) were between 15 to 50 years of age. Chronic glomerulonephritis, chronic interstitial nephritis, and diabetes nephropathy were the most common causes of ESRD. Recovery following HD was 70% in ARF, while all patients of acute on chronic renal failure improved following few sessions of HD. Drop out rate on maintained haemodialysis (MHD) was 52%. The increasing demand of dialysis service in this region is difficult to fulfill due to restricted facilities for dialysis, lack of renal transplantation in Nepal, and economic constraint in the part of patients. Primary and secondary prevention of renal diseases by community education, awareness and participation needs emphasis.

Key Words: Haemodialysis, End stage renal disease, Acute renal failure, Acute on chronic renal failure.

1. Assistant Professor, Department of Medicine, B.P. Koirala Institute of Health Sciences, Dharan, Nepal.

2. Senior Resident, Department of Medicine, B.P. Koirala Institute of Health Sciences, Dharan, Nepal.

3. House Officer, Department of Medicine, B.P. Koirala Institute of Health Sciences, Dharan, Nepal.

4. Professor, Department of Medicine, B.P. Koirala Institute of Health Sciences, Dharan, Nepal.

Address for correspondence : Dr. Sanjib Kumar Sharma, MD., Department of Medicine
B.P. Koirala Institute of Health Sciences, Dharan, Nepal.
E-mail: drsanjib@yahoo.com, Fax: 00977-25-20251

INTRODUCTION

The modern era of haemodialysis (HD) introduced by Kolf and Murray in early 1940's now constitutes the most common form of renal replacement therapy worldwide.¹ In Nepal, HD was started initially on 5th October 1988 in Bir Hospital, Kathmandu.² Since then HD service became available in various centres in Kathmandu. However, to find its place outside the capital city it took another decade. Dialysis division was started under department of medicine at B. P Koirala Institute of health Sciences Dharan in 9th September 1999. Six hundred sixty one sessions of HD were carried out during one year period in fifty patients. In this prospective study the relevant data are analysed.

MATERIAL AND METHODS

Fifty patients managed by HD from September 1999 to August 2000 composed of ESRD (End stage renal disease), Acute on chronic renal failure and acute renal failure (ARF). The pre-designed haemodialysis record sheet, case summary and dialyser re-use records were maintained and analysed. ARF, ESRD and chronic renal failure (CRF) were diagnosed on the basis of biochemical, radiological and clinical findings. In case of maintenance haemodialysis (MHD), adequacy of dialysis was assessed by Kt/V, based on the formula proposed by Jindal et al.³

RESULTS

Total of 661 sessions of HD has been carried out in 50 patients of renal failure patients requiring dialysis therapy. Majority (72%) of the patients were below 50 years of age (Table: 1)

Table: 1 Age distribution of patients on HD

Nine HD sessions were carried out in the first month of initiation of HD. After one year it has sharply increased and 88 sessions of HD were done in the month of August 2000. (Fig: 1). RSRD, ARF and

■	■	■	■	■	■
■	■	■	■	■	■

acute on CRF were present in 27 (54%), 13 (26%) and 10 (20%) of the patients respectively (Table:2)

Table: 2 Diagnosis at the time of first HD

The common causes of ESRD were chronic glomerulonephritis (CGN) and chronic interstitial nephritis (CIN). They constitute 55.5% (n=15) of cases. Diabetic nephropathy was placed third (30%). Obstructive uropathy and renal transplant rejection constituted the rest (14.5%). Post gastroenteritis (n=4) and road traffic accident (n=4) were found to be common causes of ARF in patients

undergoing HD. The common indications for undertaking HD were shown in table 3. Most of the patients had two or more indications for dialysis. 30 patients had metabolic acidosis and it was the commonest indication for HD.

Table: 3 Indications of dialysis

The majority (70%) of ARF patients recovered, whereas all patients of acute on CRF had improved after, on an average, five sessions of HD. Most of the patients (n=14) of ESRD dropped out after initial session of HD (Table: 4). Among the drop outs most of the patients ((52%)) had undergone maximum of five sessions of dialysis.

Table: 4 Outcome of patients on HD

Patients who were on MHD, in seven patients, kt/v was more than 1 (1 to 1.5) while 3 patients had kt/v below 1 signifying inadequacy of HD treatment. Almost all patients had inter-current ailment while on MHD. Four patients were infected with tuberculosis, two developed respiratory tract infections, whereas infective endocarditis, disseminated herpes zoster and gangrenous change of a-v fistula occurred in one each.

DISCUSSION

Haemodialysis has proven as a viable renal replacement therapy (RRT) for last four decades.⁴ The demographic profile of patients undergoing

HD varies in different countries and is influenced by rates of renal transplantation and restricted facilities for dialysis. However, the major determinant of RRT is certainly economic. The acceptance for RRT is low in developing countries for various reasons. In Bangladesh only 2% of the ESRD patients are accepted for dialysis and transplantation.⁵ Such data are not available from Nepal.

The majority of our patients are in the age group of 15 to 50 years. The involvement of age group in the present study corroborates with another report from Nepal and also with that from India.^{2,6} The median age of patients with ESRD in USA is 60 years, according to data from U.S. Renal Data System (USRDS).⁷ The affliction of younger age group in the most productive age group in developing countries has wide socio-economic implications. The common precipitating cause of CRF was uncontrolled hypertension (n=4) followed by infection (n=3). Majority of the patients undergoing HD were suffering from ESRD. Most of the patients with ARF underwent peritoneal dialysis due to constraint in HD machine in our center.

The most common cause of ESRD was CGN and CTN (55.5%). These two diseases are often difficult to differentiate as patients presented to us at ESRD, though absence of severe hypertension, adequate urine output and absence of edema may point towards CTN. Diabetes (30%) as a cause of ESRD was placed second in this series. In USA diabetic nephropathy is the most common (32%) cause of ESRD, followed by hypertensive nephrosclerosis (28%) and CGN (15%),⁷ While in Europe CGN (24%), CTN (17%) and diabetic nephropathy (12%) are three major causes of ESRD.⁸ In the study from Chandigarh⁹ CGN stood as the commonest cause of ESRD (37%) and was followed by diabetic nephropathy (24%) and hypertension (13%).

Almost all patients with ESRD presented to us with life threatening complications like metabolic acidosis, pulmonary edema, encephalopathy, hyperkalemia and pericarditis in various combinations for which HD was undertaken. In CRF, it is recommended that elective dialysis should be started when creatinine clearance falls below 10 mL/ min/ 1.73 Square Meter of body surface area.¹⁰ The recommendation is hardly applicable to our patients as they presented late probably due to lack of awareness of renal diseases. In addition, economic constraints prevented them from utilising the available treatment.

During the one-year period a total of 50 patients had undergone HD. Two patients died from primary illness. Majority (52%) of the patients dropped out after initial 5 or less sessions of dialysis. The drop out rates in series by Subedi et al and Chettri et al were 28% and 35.7% respectively.^{2,11} In spite of the fact that the survival rate of patients with ESRD without RRT is poor, patients were unable to continue MHD, probably due to financial constraints and non-availability of space for MHD. Lack of renal transplant facility in our country and lack of renal donor may be two other important factors.

Complication during haemodialysis is common. Acute complications like hypotension, muscle cramp, nausea, vomiting, headache, chest pain were routinely encountered. Infections in the dialysis patients constitute a major cause of morbidity due to multiple defects in host resistance.¹² In our small series tuberculosis was detected in 5 patients. The incidence of tuberculosis has been estimated to be tenfold higher among HD patients than general populations.¹³ The quality of life and adequacy of dialysis is similar factor that needs close analysis in patients who are undergoing MHD. In this preliminary analysis it was found that Kt/v was more than 1 in 70% of the patients.

Analysis from randomised National Co-operative Dialysis Study (NODS), it was found that if Kt/v is <0.8, there is higher rate of mortality and morbidity.¹⁴ Reanalysis of NODS by Hakim et. al.¹⁵ concluded that higher the Kt/v above unity, better is the outcome. Therefore, it is mandatory to keep close observation on adequacy of dialysis in patients who are undergoing MHD.

CONCLUSION

The number of patients requiring dialysis is expected to increase in future in BPKHS, which caters entire Eastern Nepal and bordering districts of India. This increase in demand is certainly difficult to cope due to limitations related to various resources like manpower, machinery and investment. Availability of renal transplant facility in the country, more dialysis units with adequate resources and social insuring may partially fulfill the demand. The efforts must be combined with prevention of renal disease by health education, community awareness, early detection and effective control of primary and secondary renal diseases to reduce the burden of ESRD.

REFERENCE

1. Steven J. Peitzman. Origins and early reception of clinical dialysis. *Am J Nephrol* 1997; 17: 299-303.
2. Subedi B K, Kafle R K, Satyal P R, Haemodialysis in Nepal. A review. *J. Inst. Med.* 1991; 13: 133-138.
3. Jindal K K, Manual A, Goldstein M B, Percent reduction in blood urea concentration during haemodialysis (PRU). A simple and accurate method to estimate kt/v urea. *Trans Am Soc Artif Inter Organs* 1987; 33: 286-288.
4. Lowrie EG. Chronic dialysis treatment. *Am J Kidney Dis.* 1994; 24: 255-266

5. Rashid H U, Rahman H, Nephrology services in Bangladesh - A neglected field in Medicine. Bangladesh Renal J 1986; 51:3-4.
6. Sakuja V, Jha V, Ghosh A K, Ahmed S, Shahu T K, Chronic renal failure in India. Nephrol Dial Transplant 1994; 9: 871 - 872.
7. U. S. Renal Data System, USRDS 1990 Annual data report. Causes of ESRD. Am J. Kidney Dis. 1990; suppl-2: 220.
8. Wing A J, Brenner F P, Twenty three years of dialysis and transplantation in Europe: Experience of the EDTA registry. Am J Kidney Dis 1989; 16: 341 - 347.
9. Mani M K, Chronic renal failure in India. Nephrol Dial Transplant 1993; 8: 684 - 689.
10. Edward T, Zawada Jr. Indications of dialysis. In: handbook of Dialysis. J T Daugirdas, T S Ing, eds. Boston, little, Brown and Company, p. 3, 1994.
11. Chhetri P K, Satyal P R, Kafle R, Khakhurel S, Pradhan B R, Experience of haemodialysis in Bir Hospital. Nepal Med. Col. J 1999; 2: 99- 100.
12. Goldblum R E, Reed W P, Host defense and immunologic alteration associated with chronic haemodialysis. Ann Intern Med. 1980; 93: 597- 613.
13. Joseph R, Lentino, David J. Leehay. infections. In: handbook of Dialysis. J. T. Daugirdas, T. S. Ing, eds. Boston, little, Brown and Company, p.473, 1994.
14. Gotch F A, Sergeant J A. A mechanistic analysis of national co-operative dialysis study (NODS). Kidney Int. 1985; 28: 526 - 534.
15. Hakim R M, Depner T A, Parker T P Adequacy of Haemodialysis. Am J. Kidney Dis 1992;20: 107- 123.

n n n

With Best Compliments

From

MEDOPHARM

Maker of

Emsolone (Prednisolone) - 40 mg, 20 mg, 10 mg, 5 mg

Serbin forte - B₁, B₆, B₁₂

M. Toin (Phenytoin) - 100 mg, 50 mg

Rogyl (Metronidazole) - 400 mg, 200 mg