

Incidence of end stage renal disease on renal replacement therapy in Nepal (1990-1999)

Hada R¹, Khakurel S¹, Agrawal RK¹, Kaffle RK², Bajracharya SB³ and Raut KB⁴

¹National Academy of Medical Sciences, Bir Hospital, ²National Kidney center, ³Shree Birendra Hospital, Chhauni, ⁴Tribhuban University Teaching Hospital

Abstract

Background: End stage renal disease patients are treated with dialysis in Nepal. But there is no renal registry to indicate the burden of disease in the country.

Objectives: The objective of this study is to find out the incidence of ESRD on renal replacement therapy and their outcome.

Materials and methods: It is a retrospective analysis (audit) of all ESRD patients who had received dialysis and transplantation from 1990 to 1999 inside Nepal. The haemodialysis (HD) registry, HD patients file, intermittent peritoneal dialysis (IPD) registry of Bir Hospital, Shree Birendra Hospital, Tribhuban University Teaching hospital and National Kidney Center were reviewed. Acute renal failure and acute on chronic renal failure were excluded and the demographic profile, dialysis session, dialysis duration and outcome of all ESRD patients were computed. One patient was counted only once in spite of attending more than one center for dialysis. SPSS package was used for analysis.

Results: Total number of 1393 ESRD patients received renal replacement therapy (RRT) in the decade. Mean age of patients were 46.7 ± 16.7 with 70% of ESRD were between 20-60 years age with male: female ratio of 1.8:1. Initial mode of RRT was IPD in 58.2%, HD in 41.7% and pre-emptive transplantation in 0.1% patients. Records of 189 patients could not be found and out of remaining 1208 patients, 85.8% received dialysis for < 3 months, 6% received dialysis for more than a year and 9.5% had undergone kidney transplantation. The incidence of ESRD had increased gradually with 3.4 per million populations (pmp) in 1990 to 11.89 pmp in 1999 with an average annual incidence of 6 pmp and only 0.31% of expected ESRD patients received RRT.

Conclusion: The incidence of ESRD is increasing but majority discontinue or die within 3 months. Dialysis centers needs to be expanded to different parts of country and prospective studies have to be carried out to find out of cause of ESRD and to institute preventive measures.

Key words: End stage renal disease, Renal replacement therapy, Haemodialysis, Intermittent peritoneal dialysis, Incidence of end stage renal disease, Nepal.

End stage renal disease (ESRD) is a common and rapidly increasing public health problem all over the world, both in developed and developing countries, consuming a bulk of economy in treating these patients¹. The National and international registries on ESRD and renal replacement therapy (RRT) in developed countries have highlighted the incidence, prevalence, etiology, prognostic factors, survival and mortality of ESRD patients^{2,3}. But in most of the developing countries such registries and government health policy to support these patients is lacking with the variation of reported annual incidence of ESRD 34 to 240 per million population (pmp)⁴. Due to lack of exact figure, the incidence of ESRD is estimated to be 100 per million populations (pmp) in South Asian countries Pakistan, India and Bangladesh^{5,6,7}.

Nepal, another South Asian country, had started dialysis service with initiation of intermittent peritoneal dialysis (IPD) in 1972 and establishment of haemodialysis (HD) unit in 1987 in Bir hospital⁸.

To cope up with increasing number of ESRD patients, HD was started in Shree Birendra hospital in December 1995, Tribhuban University Teaching Hospital (TUTH) in April 1996 and National Kidney Center (NKC) in April 1997 and other private hospitals after 2000. There were total 15 HD machines and 9 Nephrologists in the country, all in capital by the end of 1999 and IPD

Correspondence

Dr. Rajani Hada
Associate Professor,
National Academy of Medical Sciences,
Bir Hospital, Kathmandu, Nepal
E-mail: rajani.hada@hotmail.com

was practiced only in Bir hospital during the period. Continuous ambulatory peritoneal dialysis (CAPD) is performed quite infrequently and kidney transplantation has just started this year.

ESRD and RRT registry is not yet started and no data compiled to indicate the incidence of ESRD and / or RRT in Nepal. So, this retrospective study was carried out to highlight the extent of ESRD on RRT and their outcome.

Materials and methods

It is a retrospective analysis of all ESRD patients who had received one or other form of renal replacement therapy (RRT) in Nepal from January 1990 to December 1999. The haemodialysis enrollment registers and haemodialysis patient files in Bir hospital, Shree Birendra hospital, TUTH and NKC and IPD register in Bir hospital were reviewed. Acute renal failure and acute on chronic renal failure was excluded and only the patients with ESRD were included. Patients name, age, sex, address were enlisted alphabetically to avoid inclusion of same patient more than once. From IPD register, total session of IPD and outcome were recorded and from haemodialysis patients file total session, total duration of dialysis and outcome were recorded to find out the survival of these patients. As there was no etiology recorded in these dialysis registers, the cause of ESRD could not be analysed. The first dialysis enrollment date for RRT was included as the date of registration. Same patient attending a different center is counted only once. Any patient with confusion is deleted from the study. From the records of transplantation patients in outpatient department of these centers, the transplantation patients were included as ESRD patients if they had undergone pre-emptive transplantation. Results of this study were analysed by using SPSS software.

Results

Thirteen hundred and ninety-three ESRD patients received RRT in 10 years (1990-1999) in Nepal. 1391 patients received dialysis and 2 patients had undergone pre-emptive transplantation in India. Out of 1391 patients, 46 patients received dialysis in more than one centre. Mean age of patients was 46.7 ± 16.7 years with age ranging from 8 to 89 years. 905 (65%) patients were male and 488 (35%) patients were female with male to female ratio of 1.8:1.

On grouping of the subjects according to age distribution 86 (6.2%) patients were up to 20 years, 439 (31.5%) patients were of >20 to 40 years age, 549 (39.4%) patients were of >40 to 60 years age and 319 (22.9%) patients were of >60 years showing 70% of ESRD in productive age group (20-60 years).

Incidence of ESRD on RRT

Annual incidence of ESRD patients during the study period is shown in Table 1 and Fig. 1.

There is gradual increase in number of patients of ESRD each year with 61 patients in 1990 to 270 patients in 1999 and an increasing trend to affect all age groups and both sex.

Calculation of total incidence of ESRD on RRT per million populations (pmp) of Nepal has shown rise of incidence from 3.4 pmp in 1991 to 11.89 pmp in 1999 with an average of 6 pmp in the decade. On calculating the percentage of RRT given in Nepal with estimated incidence of ESRD 100 pmp per year as par with South Asian countries^{5,6,7}, only 0.31% ESRD had received RRT in that decade.

Mode of RRT and survival of patients

Out of 1393 ESRD patients, 2 had pre-emptive transplantation, 810 (58.2%) had IPD [160 (11.5%) had IPD followed by HD] and 581 (41.7%) had only HD. Among total number of 741 (53.2%) patients on HD the records of 189 (13.6%) ESRD patients could not be found.

So on further analysis of total 1204 ESRD patients on RRT, 115 (9.5%) patients had undergone transplantation (2 - pre-emptive, 3 after IPD and 110 after HD) and 6 (0.45%) patients on HD had switched over to CAPD. Out of remaining 1083 (89.95%) ESRD patients, 647 (59.7%) received only IPD and 436 (40.3%) received HD [339 (31.3%) had only HD and 97 (9%) had IPD followed by HD].

All patients on IPD received dialysis for < 3 month though 511 (36.6%) received 1 session, 98 received 2 sessions, 24 received 3 sessions, 8 received 4 sessions, 3 received 5 sessions, 3 received 6 sessions.

On analysis of patients on HD, 282 (26%) had dialysis for < 3 months, 95 (8.7%) had dialysis for < 1 year and 59 (5.4%) had dialysis for > 1 year.

So, total number of 929 (85.8%) ESRD patients had dialysis for < 3 months and only 59 (5.4%) patients had maintenance dialysis for more than 1 year. But on including 15 patients in HD for > than 1 year prior to transplantation and CAPD, total 74 (6.1%) patients had survived for > 1 year in HD.

Survival of these patients is shown in Table 2. Among 4 patients with survival for > than 5 years 1 deceased on MHD, 1 deceased after switching to CAPD and 2 are still surviving (1 has completed 10 years & another has completed 9 years).

Table 1: Annual incidence of ESRD with renal replacement therapy in Nepal

Years	Total number of ESRD on RRT	Total population of Nepal ^b (in million)	Total number of ESRD on RRT per million population (pmp)	Estimated incidence of ESRD with 100 pmp per year as par with South Asian countries ^{5,6,7}	Proportion of patient receiving RRT in % ^c
1990	61	17.9 ^a	3.4	1790	0.18
1991	68	18.4	3.6	1840	0.19
1992	97	19.0	5.1	1900	0.26
1993	78	19.5	4.0	1950	0.20
1994	125	20.0	6.25	2000	0.31
1995	134	20.5	6.53	2050	0.31
1996	159	21.2	7.5	2120	0.35
1997	189	21.6	8.75	2160	0.40
1998	212	22.1	9.59	2210	0.43
1999	270	22.7	11.89	2270	0.52
	1393 (100%)		Average – 6.0		Average – 0.31%

^a Estimated population on the basis of population growth from 1991 to 1992 using exponential growth rate model ($P_{1991} = P_{1990} \times e^r$).

^b Projected population (Median variant) by sex and single calendar year, Population projection of Nepal, 1991 – 2011, Central Bureau of Statistics.

^c (ESRD on RRT pmp ÷ Estimated incidence of ESRD with 100 pmp per year) x 100

Table 2: Survival in years of ESRD patients on Dialysis

	Only on dialysis	Dialysis prior to transplantation and CAPD	Total
>1 – 2 years	34	9	43
>2 – 3 years	13	2	15
>3 – 4 years	5	2	7
>4 – 5 years	4	1	5
> 5 years	3	1	4
Total	59	15	74

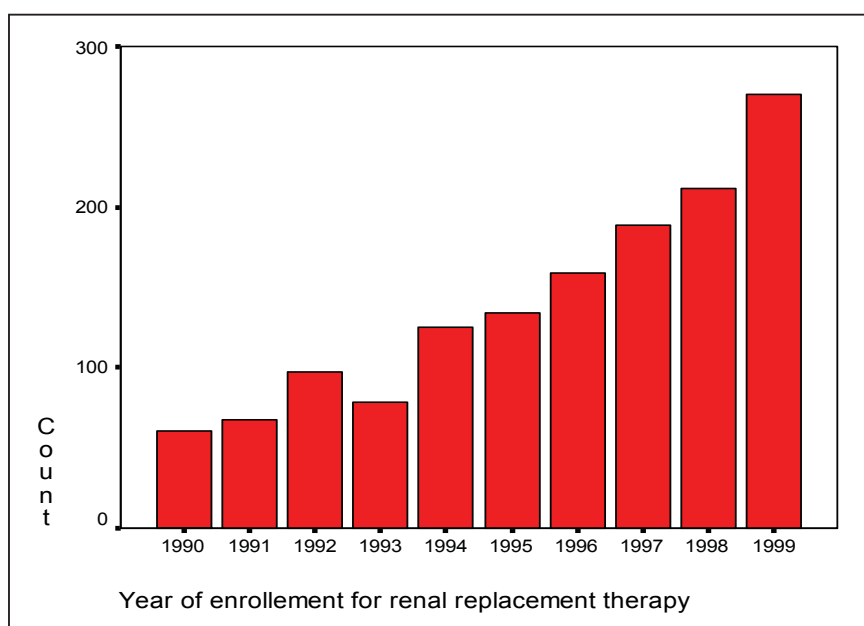


Fig 1: Annual incidence of ESRD patients

Discussion

Due to lack of health education, centralised dialysis facilities, under diagnosis & inadequate referral from peripheral hospitals and low socioeconomic conditions, the result of this study indicates the tip of ice berg of ESRD in this country and majority of patients must have died without diagnosis and reaching central hospitals.

Mean age of ESRD patients were 46.7 ± 16.7 years, older than reported in developing countries - Bangladesh, India and Pakistan (38-42 years)^{7, 9, 10}, much younger than developed countries (> 60 years)¹¹ and 70% patients were of productive age group from 20- 60 years.

Present study has shown predominance of male (65%) over female (35%) similar to other studies in India (67.8% male and 32.2% female)¹², Saudi Arabia (64.5% male and 35.5% female)¹³ and Japan (54.4% male and 45.6% female)¹⁴.

With increasing population, the incidence of ESRD patients is increasing dramatically all over the world. Due to lack of registries, the estimated annual incidence of ESRD in South Asian countries^{5, 6, 7} is 100 pmp though the number of patients enrolled for dialysis is only 3-5 pmp in India¹⁵. Present study has shown gradual increase of incidence of ESRD patients with 3.6 pmp in 1990 to 11.8 pmp in 1999 with an average annual incidence of ESRD on RRT of 6 pmp. RRT replacement therapy was given to only 0.31% of estimated ESRD patients (Table-I) showing inadequate referral, under diagnosis and need of expansion of dialysis facility to peripheral hospitals.

Due to unavailability of adequate number of HD machines and financial constraint of patients, IPD using rigid stylet-based catheter was performed as a temporary means of dialysis of ESRD patients in many developing countries though survival of ESRD patient (6 months – 2.5 years) with IPD was reported in Bangladesh in 1984¹⁶. With increasing dialysis centers in government and private hospital, IPD is now restricted to remote areas of India¹⁷. IPD as the initial mode of dialysis in 58.2 % and HD in 41.7% ESRD patients in the present study indicate the inadequate number of HD machines.

Due to poor economic status 60% of HD patients in India discontinue dialysis within 3 months, 17% undergo kidney transplantation, 13% die within 1 year and 4% remain on MHD for more than 1 year⁶. Moreover due to high cost of RRT, 30% of patients on dialysis in Bangladesh abandon treatment within 3 months after the start of dialysis and die and 10% undergo transplantation⁷. In the present study, 85.8% patients discontinued dialysis and died within 3 months, 8.7% died within 1 year, 6% survived for more than 1 year

on dialysis and 9.5% had undergone transplantation indicating the poor outcome of ESRD patients in Nepal till this decade.

Conclusion

The incidence of ESRD patients are increasing in all age group and sex.

Majority of patients discontinue dialysis and die within 3 months. Hence, Dialysis needs to be given more attention. Dialysis centers need to be expanded to different parts of country. Prospective studies have to be carried out to find out of cause of ESRD and institute preventive measures.

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