

Peritoneal Dialysis in Nepal - A Review

¹B K Suvedi

²R K Kafle

³P K Satyal

A total of 136 patients undergoing peritoneal dialysis for different indications for a period of two years is reviewed. Male predominance and relatively high frequency in elderly age was seen. Majority of them were diagnosed as Chronic Renal Failure (65.5%) followed by Acute Renal Failure (29.4%). Blood urea and serum creatinine was found raised in all patients while a majority had hyponatremia. A great majority of patients (82.4%) improved with the procedure.

INTRODUCTION

First reported peritoneal dialysis in Nepal was done to a patient with acute renal failure (ARF) following reaction to dextrose saline transfusion.¹ Thereafter, peritoneal dialysis was a routine procedure in Bir Hospital, though we lack the data for indications and outcome. However with establishment of Nephrology Unit under the Department of Medicine in Bir Hospital in Baisakh 2041 (i.e. May 1984) the service of peritoneal dialysis is rendered through this unit.

Many patients with diagnosis 'uraemia' are referred from different hospitals and nursing homes both inside and outside of Kathmandu valley and it is seen that specialized and comparatively sophisticated hospitals with different specialists also refer the patients with uraemia to Bir Hospital, which in turn, is over-loaded with the flow of patients. In

our series, 82 out of 136 (61.1%) patients were referred from different hospitals.

AIM OF THE STUDY

This study was undertaken to see the pattern of patients undergoing peritoneal dialysis as no such reference was available in our national medical literature, to review the outcome and efficacy of the procedure and also to share the experience.

METHODS AND MATERIALS

The case history and hospital data of the patients, who underwent peritoneal dialysis for a period of two years from 1st Baisakh 2046 to 31st Chaitra 2047 (i.e. 14th April 1989 to 13th April 1991) are reviewed. A total of 136 patients were dialysed by peritoneal dialysis (PD) during this period.

1. N. Medical Officer, Bir Hospital.

2. MRD, Medical Registrar, Nephrologist, Bir Hospital.

3. MRCP, Senior Consultant Physician, Nephrologist, Bir Hospital.

Address for Correspondence: Dr B K Suvedi, P O Box 3468, Kathmandu, Nepal.

RESULTS

Table 1 below shows number and sex of patients, who underwent peritoneal dialysis in different years.

Year (B. S.)	Number of patients		
	Male	Female	Total
2046	28	26	54
2047	61	21	82
Total	89	47	136
%	65.4	34.6	100

Table 1: Number and Sex of patients undergoing PD

From the table 1 it is seen that the number of patients is increasing each year and that there is male predominance.

Age group	< 20	20 -29	30 - 39	40 - 49	50 - 59	> 60 yrs	Total
No. of Patients	8	15	17	27	33	36	136
%	5.9	11.0	12.5	19.9	24.3	26.5	100

Table 2: Age group of patients undergoing PD

From this table it is seen that most of the times the procedure was done in advanced age patients with decreasing frequency in the younger age group.

Acute Renal Failure (ARF)*	40 (29.4%)
Chronic Renal Failure (CRF/Ac. Exacerbation)** 61	
Chronic renal Failure/Diabetic Nephropathy 28	89 (65.5%)
Obstructive uropathy/Urolithiasis	7 (5.1%)

Table 3: Provisional Diagnosis in Patients before PD.

- * ARF due to Acute nephritis - 11, Gastro-enteritis - 22, organo-phosphorous poisoning - 2, post - partum - 2, wasp bite - 1 and surgical procedure - 2.
 ** Acute exacerbation in patients with chronic renal failure-9.

From this table it is seen that a majority of the patients are with chronic renal failure, be it chronic nephritis, acute exacerbation of CRF or diabetic nephropathy. What is notable here is that acute renal failure due to different causes are in most instances curable, if managed in time (not shown in the table).

Table 4 shows the range of blood urea and serum creatinine level in patients before performing PD.

Blood Urea Level (mg %)	No. of Patients	%	Creatinine Level (Mg%)	No. of Patients	%
< 100	6	4.4	< 3.5	7	5.1
101 - 200	80	58.8	3.6 - 5	21	15.5
> 201	50	36.8	5.1 - 10	73	53.7
			> 10.1	35	25.7

Table 4: Blood urea and Serum creatinine level before PD

From this table it is seen that a majority of patients had blood urea level in between the range of 101-200 mg% and serum creatinine level in between 5.1 - 10 mg%, which might be explained by prevalence of patients with chronic renal failure.

Serum Na level (meq/L)	No. of Patients	%	Serum K level (meq/L)	No. of Patients	%
< 135	97	71.3	< 3.5	32	23.5
135-145	37	27.2	3.5 - 5.5	87	64.0
> 145	2	1.5	> 5.5	17	12.5

Table 5: Serum sodium & potassium level in patients before PD

From this table it is seen that a majority of the patients were hyponatremic but normokalemic, however hyperkalaemia was seen more often than hypernatraemia.

Table 6 shows outcome of the procedure.

Improved with the procedure	112	82.4%
Died during the procedure	23	16.9%
Left against medical advice	1	0.7%

Table 6: Outcome of peritoneal dialysis procedure.

From this table it is seen that the procedure has very good outcome: more than 82 percent of the patients improved with the procedure. Of the total 136 procedures, 5 patients had complications due to the procedure, namely, peritonitis in 2, and turbid dialysis fluid in 3 (not shown in the table). But the cause of death was not due to the procedure, but the disease itself, as on an average, only 9 PD cycles (which are not sufficient to get the effect of the procedure), could be done in those patients, before death.

DISCUSSION

The term "Dialysis" was coined by a Scot chemist Thomas Graham. Peritoneal dialysis was first used in 1923 by Ganter and became widespread in the 1950s, exclusively for the management of acute renal failure.¹

Peritoneal dialysis (PD) is an effective method to correct fluid volume disturbances and also to maintain the plasma biochemistry within acceptable limits.² It is easy to perform and can be undertaken in almost any clinical environment where sterility can be provided.³

Peritoneal dialysis can be regarded as emergency procedure in countries like ours where acute renal failure (ARF) due to pre-renal (dehydration and surgical and gynaecological procedures) and renal causes might cause significant morbidity and mortality due to its geographical condition and non-availability of services like hemodialysis.

Peritoneal dialysis has four main indications⁴ and performed acutely for acute renal failure by a temporary peritoneal catheter or on chronic basis for continuous ambulatory peritoneal dialysis. The indications are:

- For acute dialysis including the presence of uremic syndrome, hyperkalaemia, acidosis or volume overload & prophylactically in patients with ARF.
- Chronic dialysis, if creatinine clearance is < 0.10-0.15 ml/min/kg.
- Uremic syndrome.
- Hyperkalaemia.

Besides these indications, patients with anuria or oliguria with hypertension and hyponatremia were also provided PD service.

Peritoneal dialysis uses the peritoneal membrane as the semi-permeable membrane and allowing equilibration to take place between extracellular fluid and fluid instilled in the peritoneal cavity. In acute PD, exchanges may be performed often (hourly). Peritoneal Dialysis does not require systemic anticoagulation and produces less stress on the cardio-vascular system, so offers advantages over hemodialysis, besides easy technique and low cost. In term of efficiency, though, it is approximately one eighth as efficient as hemodialysis in altering blood solute composition and about one fourth as efficient in term of fluid removal.⁴ But in patients with contraindications for hemodialysis or non-availability of this service, PD is the only option.⁵

In this series of ours the number of patients is increasing each year and in an average a total of 58 cycles was performed to each patient. Average day of stay was very high in these patients (21 days), which made it almost impossible to accept new patients and it arouses a very delicate question: Can't PD service be provided in other referring hospitals, where a physician is available?

Chronic renal Failure (CRF), due mainly to chronic glomerulo-nephritis and diabetic nephropathy, was the frequently found entity in patients undergoing PD procedure but acute

renal failure also contributed to significant proportion, mainly due to dehydration (acute gastroenteritis - 55% and acute nephritis).

Blood urea and serum creatinine level were found to be in higher side whereas serum sodium in lower side, compared to normal serum potassium. (A serum potassium level higher than 6.5 meq/L is an emergency!).

The outcome of the procedure seems convincing towards starting PD services in at least hospitals, where the physicians and nursing staff to tackle with dialysate exchange are available. Our Nephrology Unit is planning to run PD service at the general medical ward, so that we will be able to demonstrate the feasibility of such procedure in medical ward as ARF deserves attention immediately and is worth taking to save lives in context like ours where these have ended fatally due to non-availability of a simple but safe and effective procedure as PD.

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