

KIDNEY DIALYSIS FOUNDATION

ANNUAL REPORT

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EXECUTIVE SUMMARY

The Peritoneal Dialysis Centre of the Kidney Dialysis Foundation is located at the Kreta Ayer Centre and the programme started on 1 July 2003. The dialysis service is contracted out to a dialysis provider and the current provider is Baxter Healthcare Pte Ltd.

This report covers medical data collated at the end of 2005.

Patient demographics: There were 75 patients on the PD programme as of 31 Dec 2005. Fifty-nine new patients were accepted into the PD programme during the period of 1 Jan 2005 to 31 Dec 2005. Thirty-five of the patients were referred from the National University Hospital, 22 from the Singapore General Hospital and 2 from Tan Tock Seng Hospital.

The mean age of the 75 patients was 50 ± 9.5 years; 27 were male, 48 female; Chinese-47, Malay-24, Indian-4. Fifty-nine were on CAPD and 16 on APD. The major cause of end-stage renal failure was diabetic nephropathy making up 57.6% of the new patients and 49.4% of the existing patients. The average age of entry into the programme increased from 46 ± 9.3 years in 2003 to 59 ± 10.8 years in 2005.

Hospitalisations: 44.0% of the patients were admitted in the year. The admission rate was 1.11 episodes per patient year or 9.68 days per dialysis year. The rate in diabetics was 1.34 episodes per patient year and 13.1 days per dialysis year.

Dialysis Parameters

Dialysis Adequacy: The total KT/V was 2.37 ± 0.7 with 88.4% of the patients meeting the minimum target of 1.7.

Peritonitis Rate: The peritonitis rate was 1 in 65.2 patient months.

Anemia: The mean haemoglobin was 10.7 ± 1.8 g/dl with 62 patients (82%) on erythropoietin. Eleven (14.7%) patients had a haemoglobin above the target level of 12 g/dl.

Serum Albumin: The patients tended to have a low serum albumin level with a mean of 31.5 ± 4.7 g/L. About half (52.1%) of the patients could not meet the lower limit of normal which is 37 g/L.

Lipid profiles: Profiles were generally poor with a mean LDL cholesterol of 2.9 ± 1.1 mmol/L and triglyceride of 2.5 ± 1.8 mmol/L. The mean HDL cholesterol level was 1.5 ± 0.4 mmol/L.

Transplant Waiting List: 10.6% of the patients were on the National Transplant waiting list while another 41.3% were not medically eligible for transplantation.

PERITONEAL DIALYSIS PROGRAMME

STAFFING

Medical

The Medical Director of the PD programme reviews the PD patients every 6 months following their routine blood investigations. The patients continue on follow-up with their referring physicians in the restructured hospitals. Urgent medical cover has been arranged with family physicians working in the vicinity using the same clinics as those arranged for the hemodialysis patients.

Nursing

The PD programme is supervised by the Patient Services Manager Ms Theresa Soh and there are two nurses employed by the dialysis provider, Baxter Healthcare Pte Ltd. The Charge Nurse, Wu Sin Yan, is renal-trained and the second nurse is S/N Vivienne Ong. The number of nurses in the programme will be increased at the rate of one new nurse for every 40 new patients with a current cap of 200 patients and 6 nurses. The charge nurse and other KDF staff perform home visits on a periodic basis.

PATIENT TRAINING

As of Dec 2004, CAPD training has been conducted by the parent hospital. In instances where the patient has been admitted to the KDF PD programme prior to initiation of dialysis, the patient undergoes orientation in KDF prior to training. On completion of training by the hospital, the patient is assessed after discharge by the KDF charge nurse in the PD Centre. The charge nurse and other KDF staff also perform a home visit to ensure a proper environment for the PD procedure.

DIETETICS

The dietician Ms Pauline Chan is provided by Baxter Healthcare Pte Ltd and gives dietary counseling to the PD patients. The patients are seen once every 6 months at the same time as their medical follow-up visit with the Medical Director.

PATIENT WELFARE

Patients received subsidies for dialysis and erythropoietin on a case by case basis and patient welfare matters are handled by the Welfare Executive, Ms Janice Soon.

PATIENT POPULATION

There were 75 patients on the PD programme as of 31 Dec 2005. Fifty-nine new patients were accepted into the PD programme during the period of 1 Jan 2005 to 31 Dec 2005. Thirty-five of the patients were referred from the National University Hospital, 22 from the Singapore General Hospital and 2 from Tan Tock Seng Hospital. The large number of patient referrals coming from NUH is the result of a partnership programme known as the KDF-NUH Peritoneal Dialysis Programme where patient care is optimised by early patient referral and close communication between the two organizations.

During the period of 1 Jan to 31 Dec 2005, there were 4 deaths and 3 patients transferred to hemodialysis.

STOCK AND FLOW

Table 1 – Patient Stock and Flow

ENTRY	2003	2004	2005
New cases	9	14	59
Transfers	0	0	0
Total Entries	9	14	59
EXIT			
Transfer out to other program	0	0	3
Deaths	0	0	4
Total Exits	0	0	7
Total No of Pt	9	23	75

Table 2 – Source of Referral

	2003	2004	2005
SGH	7	12	22
NUH	2	2	35
TTSH	0	0	2
Total Entries	9	14	59

Patient characteristics

The mean age of the 75 patients was 50 ± 9.5 years, with a predominance of females [Male: 27 (36%), Female: 48 (64%)] and a larger proportion of Malays when compared to the ethnic distribution of the general population [Chinese-47 (62.7%), Malay-24 (32%), Indian-4 (5.3%)]. Fifty-nine patients were on CAPD and sixteen on APD. The major cause of end-stage renal failure in the PD programme is diabetic nephropathy making up 57.6% of the new patients and

49.4% of the existing patients. The mean age of entry into the programme has increased over the years from 46 ± 9.3 years in 2003 to 59 ± 10.8 years in 2005.

CAUSE OF END-STAGE RENAL DISEASE

Table 3 - Etiology of end-stage renal disease in new patients

Etiology	2003		2004		2005	
	n	%	n	%	N	%
Chronic glomerulonephritis (no biopsy)	2	22.0	2	14.3	10	17.0
IgA nephropathy	2	22.0	2	14.3	1	1.7
Focal sclerosing GN	-	-	1	7.1	-	-
Drug induced GN	-	-	-	-	1	1.7
Membranous GN	-	-	-	-	1	1.7
Diabetic nephropathy	2	22.0	6	42.9	34	57.6
PCKD	3	34.0	-	-	1	1.7
Renal calculi	-	-	1	7.1	-	-
Renovascular disease	-	-	-	-	2	3.4
Unknown	-	-	2	14.3	9	15.2
Total	9	100.0	14	100.0	59	100.0

Table 4 - Etiology of end-stage renal disease in prevalent patients

Etiology	2003		2004		2005	
	n	%	n	%	N	%
Chronic glomerulonephritis (no biopsy)	2	22.0	4	17.4	14	18.7
IgA nephropathy	2	22.0	4	17.4	5	6.7
Focal sclerosing GN	-	-	1	4.3	1	1.3
Drug induced GN	-	-	-	-	1	1.3
Membranous GN	-	-	-	-	-	-
Diabetic nephropathy	2	22.0	8	34.8	37	49.4
PCKD	3	34.0	3	13.0	4	5.3
Renal calculi	-	-	1	4.3	1	1.3
Renovascular disease	-	-	-	-	2	2.7
Unknown	-	-	2	8.8	10	13.3
Total	9	100.0	23	100.0	75	100.0

GENDER

Table 5 - Gender of new patients

	2003		2004		2005	
	n	%	n	%	n	%
Male	1	90.1	3	21.4	31	52.5
Female	8	88.9	11	78.6	28	47.5
Total	9	100.0	14	100.0	59	100.0

Table 6 - Gender of prevalent patients

	2003		2004		2005	
	n	%	n	%	N	%
Male	1	90.1	4	17.4	27	36.0
Female	8	88.9	19	82.6	48	64.0
Total	9	100.0	23	100.0	75	100.0

Table 7 – Ethnic distribution of new patients

	2003		2004		2005	
	n	%	n	%	N	%
Chinese	5	56.0	8	57.0	41	69.5
Malay	2	22.0	6	43.0	17	28.8
Indian	2	22.0	0	0	1	1.7
Others	0	0	0	0	0	0
Total	9	100.0	14	100.0	59	100.0

Table 8 – Ethnic distribution of prevalent patients

	2003		2004		2005	
	n	%	n	%	n	%
Chinese	5	56.0	13	56.5	47	62.7
Malay	2	22.0	8	34.8	24	32.0
Indian	2	22.0	2	8.7	4	5.3
Others	0	0	0	0	0	0
Total	9	100.0	23	100.0	75	100.0

AGE

Table 9 – Mean age of entry into programme

Year	2003	2004	2005
Mean age (years)	46	49	59
SD	9.3	7.3	10.8

Table 10 – Mean age of prevalent patients on programme

Year	2003	2004	2005
Mean age (years)	49	48	50
SD	9.0	8.1	9.5

COMORBIDITY

There were 37 (49.4%) patients with diabetes in the prevalent population in 2005.

DEATHS AND WITHDRAWALS

There were four deaths and three withdrawals (transfers to hemodialysis) in 2005. The causes of death in the 4 cases were sepsis from a gangrenous limb, acute myocardial infarction, malignancy (colon and lung) and death at home. The 3 transfers to hemodialysis were the result of scrotal odema, a catheter-related problem and peritonitis.

HOSPITALISATIONS

There were 58 admissions in 33 patients. Therefore, 44.0% of the patients were admitted in the year. There were five patients with recurrent admissions of 3 or more admissions in the year and they accounted for 201 admission days (39.6% of total admission days). The admission rate was 1.11 episodes per patient year or 9.68 days per dialysis year. The rate in diabetics was 1.34 episodes per patient year and 13.1 days per dialysis year. PD related admissions accounted for 25.7% of all admissions.

Table 11 – Hospitalisations

HOSPITALISATION	ALL	DM	NON-DM
Number of patients ever in prog	75	45	30
Total patient years	52.4	29.8	22.6
Number of patients ever admitted	33	22	11
Admission episodes	58	40	18
Admission days	507	386	121
Days hospitalized			
PD related – technical	19	10	9
- infection	117	66	51
Other Infections	79	55	24
Others	292	255	37
% patients ever admitted	44.0%	48.9%	36.6%
Episodes per patient year	1.11	1.34	0.79
Days per patient year	9.68	13.1	5.35
Days per patient year			
PD related – technical	0.36	0.34	0.39
- infection	2.23	2.21	2.26
Other Infections	1.51	1.84	1.06
Others	5.57	8.57	1.64
Percentage of admissions			
PD related - technical	6.8%	5.0%	11.1%
- infections	18.9%	15.0%	27.8%
Other Infections	13.8%	10.0%	22.2%
Others	60.5%	70.0%	38.9%

Hospitalisations during the period Jan-Dec 2005 were analysed and expressed as days hospitalized per patient year of dialysis programme.

DIALYSIS PARAMETERS

Dialysis Adequacy

Dialysis adequacy is assessed using the total KT/V and is measured 6 monthly. The minimum total KT/V is 1.7. The total KT/V (which is the sum of the dialysate and residual KT/V) of the cohort was 2.37 ± 0.7 . Although the mean KT/V was above the minimum requirement, 8 patients (11.6%) did not meet the required minimum of 1.7. The 8 patients had virtually no residual renal function compared to the group with $KT/V > 1.7$ (0.03 ± 0.06 vs 0.37 ± 0.47) but they were otherwise no different in terms of duration on PD or body surface area (BSA).

Table 12 - KT/V

	2003	2004	2005
N	9	23	69 (6 not done)
Total KT/V	2.55 ± 0.5	2.53 ± 0.5	2.37 ± 0.7
Dialysate KT/V	2.10 ± 0.3	2.07 ± 0.3	1.96 ± 0.4
Residual KT/V	0.45 ± 0.4	0.46 ± 0.3	0.33 ± 0.5
% patients with KT/V ≥ 1.7	100.0	100.0	88.4 (8 out of 69 <1.7)

Peritonitis Rate

There were a total of 11 episodes of peritonitis during the period of 1 Jan 2005 to 31 Dec 2005 making the peritonitis rate 1 episode in 65.2 patient months. The peritonitis rate in 2004 when there were 23 patients on the programme was better at 1 episode in 112 patient months. The peritonitis rate has increased as a result of a number of factors including the older age of the new patients who also have more co-morbid conditions, including diabetes.

Table 13 – Peritonitis rate

System	Total Patient Months	No of episodes	Infection Rate (Episodes/ Patient month)
APD (Home choice)	91.18	2	45.59
CAPD (Ultrabag)	626.02	9	69.56
All Systems	717.2	11	65.2

Anemia

The mean haemoglobin was 10.7 ± 1.8 g/dl with 62 patients (82%) on erythropoietin. Eleven (14.7%) patients had a haemoglobin above the target level of 12 g/dl.

Table 14 – Haemoglobin and Use of Erythropoietin

Hb (g/dl)	2003		2004		2005	
N	9		23		75	
Mean \pm SD	11.9 ± 2.6		11.1 ± 1.8		10.7 ± 1.8	
< 10 not on EPO	1	11.0%	1	4.3%	3	4%
< 10 on EPO	2	22.0%	4	17.4%	22	29%
> 10 not on EPO	1	11.0%	6	26.0%	10	13%
> 10 on EPO	5	56.0%	12	52.2%	40	53%

Serum Albumin

The patients tended to have a low serum albumin level with a mean of 31.5 ± 4.7 g/L. However, the nutritional status of the cohort appears to have improved with 52.1% not exceeding the lower limit of serum albumin of 37g/L compared to 2004, when 95.1% did not exceed the lower limit.

Table 15 – Serum albumin

Albumin (g/L)	2003	2004	2005
N	9	21	71
Mean \pm SD	28.7 ± 4.6	30.7 ± 5.9	31.5 ± 4.7
% < 37 g/L	88.8	95.2	52.1
% < 30 g/L	66.7	33.3	39.4

Hyperlipidemia

Patients had poor lipid profiles with a mean LDL cholesterol of 2.9 ± 1.1 mmol/L and triglyceride of 2.5 ± 1.8 mmol/L. Only 25% of the patients were within the recommended MOH guidelines for LDL cholesterol (< 2.6 mmol/L) while 59.3% were within the recommended level for triglyceride (<2.3 mmol/L). Interestingly, the mean HDL cholesterol level was 1.5 ± 0.4 mmol/L with 88.3% falling within the recommended level (≥ 1.0 mmol/L).

Table 16 – Serum Cholesterol and Triglycerides

	2003	2004	2005
Total Cholesterol (mmol/L)	5.7 ± 2.2 (n = 2)	5.7 ± 1.2 (n = 18)	5.3 ± 1.5 (n = 59)
% < 4.1 mmol/L	50.0	11.0	10.2
LDL Cholesterol (mmol/L)	3.3 ± 1.2 (n = 2)	3.1 ± 1.0 (n = 15)	2.9 ± 1.1 (n = 52)
% < 2.6 mmol/L	100.0	26.7	25.0
HDL Cholesterol (mmol/L)	1.9 ± 0.6 (n = 2)	1.5 ± 0.4 (n = 18)	1.5 ± 0.4 (n = 60)
% ≥ 1.0 mmol/L	100.0	94.0	88.3
Triglycerides (mmol/L)	1.3 ± 0.8 (n = 2)	2.3 ± 1.8 (n = 16)	2.5 ± 1.8 (n = 59)
% < 2.3 mmol/L	100.0	56.3	59.3

TEMPORARY HEMODIALYSIS

No patients required temporary hemodialysis in the year.

TRANSPLANT WAITING LIST

Only 8 (10.6%) patients were registered on the transplant register with 23 (30.6%) pending registration. A large number of patients (31 patients, 41.3%) were not eligible for transplant as a result of exceeding the age limit of 60 years (27 patients, 36.3%) or because they were seropositive for Hepatitis B or C (4 patients, 5%)

Table 17 - Transplant Status

	2003		2004		2005	
N	9		23		75	
Registered	1	11.0%	6	26.0%	8	10.6%
Not eligible	1	11.0%	4	17.4%	31	41.3%
Opted out	0	0	4	17.4%	13	17.3%
Pending	7	78.0%	9	39.0%	23	30.6%

ACTIVITIES OF THE PD CENTRE

KDF-NUH programme: A meeting was held on 1 Dec 2004 to discuss the details of the programme that has since been implemented and resulted in the large increase in the number of referrals from NUH in 2005.

Patient activities: The PD patients participated in a Family Day at Fort Canning on 13 March 2005.

Most Compliant Patient Award

The awards are given to compliant patients that participate actively in their dialysis treatment and the PD nurses and Medical Director (PD) select the awardees based on standard criteria. This year's awardees were Mdm Roszia bte Hashim (2nd time), Ms Wang Lian Huay and Mdm Yap Mui Kia.

CONCLUSION

The PD programme grew tremendously in 2005 from 23 patients in 2004 to 75 patients by 31 Dec 2005. As expected in any PD programme, the patients have many co-morbid conditions including an older age and diabetes. This has led to a deterioration in certain dialysis parameters including the peritonitis rate and hospitalization rates.

The current challenge for the PD programme would be to continue to provide affordable, high quality dialysis in a cohort of patients with multiple co-morbid conditions.

Dr Grace Lee Siew Luan
Medical Director (Peritoneal Dialysis)