Original Article

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Study of Clinical Profile of CAPD Patients in Eastern India – A Clinical Observation

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Abstract

Background: The prevalence of end-stage renal disease (ESRD) requiring renal replacement therapy is rising steadily in developed and developing countries. Currently, continuous ambulatory peritoneal dialysis (CAPD) and in-center hemodialysis (HD) are the two major modes of dialysis used to treat ESRD. Only 8% of PD patients are initiated on PD directly, 92% are shifted from HD There are several approaches to measuring peritoneal membrane function like peritoneal equilibration test (PET), the standard permeability analysis (SPA). Successful treatment with PD encompasses several important quality targets like Patient survival, Technique survival, Quality of life, Nutrition status. Complications includes Catheter malfunction, Exit site infection, Peritonitis, Fluid leaks. In this observational study of clinical profile of CAPD patients 40 patients were taken. Of the 40 patients included in study 72.5% were male and 27.5% were female. Various factors for preference of CAPD are remote places, expenditure (35%), cardiovascular morbidity (25%). The observations are out of 52 % had well maintained nutrition, KT/V score ranges from 1.2 to 7 with mean (SD) 3.88 ± 1.59, only 22.5% have peritonitis and catheter exit site infections. None had catheter removal. All our outcome (such as correction of anemia, nutritional status, clinical well-being, absence of edema) and biochemical parameters (for e.g. Peritoneal Equilibrium Test, weekly KT/V) will used to knowing the adequacy which is consistent to results of various national and international studies.

Keywords: ESRD, CAPD, Peritoneal equilibration test (PET), Peritonitis.

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Introduction

Continuous ambulatory peritoneal dialysis (CAPD) and in-center hemodialysis (HD) are the two major modes of dialysis used to treat ESRD. Fifty-eight percent of PD patients are treated in developing countries (n=114,221), and the remaining 42% in developed countries (n=81,334). Top five PD countries are New Zealand, Sweden, Denmark, Finland and Australia. Among the developing countries India is at fourth position preceded by Mexico, China and Brazil. Despite PD having been available for almost 15 years, the modality's penetration remains below 20% in India.[1] Only 8% of PD patients are initiated on PD directly, 92% are shifted after being on HD for a mean duration of about 6 months. Of those, two thirds are switched because they tolerate HD poorly, 30% because of comorbid conditions and vascular access problems, and 3% because of lifestyle issues .Currently about 7000patients in India are on PD.[2]

The peritoneal microvessels and mesothelium are thought to function by either the two or the three-pore size model of capillary permeability.[3] There are several approaches to measuring peritoneal membrane function peritoneal equilibration test (PET), the standard permeability analysis (SPA), the peritoneal dialysis capacity (PDC) measurement, and the dialysis adequacy and transport test (DATT). The (PET) has been the test most widely used. A good catheter provides obstruction free access to the peritoneum. Globally, the catheter most widely used is the Tenckhoff catheter, followed by the swan-neck catheter. A patient's economic situation also dictates a PD prescription. The most common method practiced in India is to put patients on three 2-L exchanges daily. Successful treatment of uremic patients with peritoneal dialysis (PD) encompasses several important quality targets. The most important are patient survival, technique survival, quality of life, nutrition status, hypertension control, correction of anemia, control of renal osteodystrophy, reduction of cardiovascular events. Recommendations by the Kidney Disease Outcomes Quality Initiative (KDOQI) that the weekly dose of CAPD achieve a

Kt/Vurea of at least 2.0 for all patients. Recently published data shows culture positive organisms found only in 63% – 72% of peritonitis episodes, out of them gram-negative organisms constitute 60% – 66% of all positive cultures. Some of the complications of CAPD includes catheter malfunction, exit site infection, peritonitis, fluid leaks, Pain related to peritoneal dialysis i.e. Inflow and Outflow pain, blood-stained dialysate and nutritional and metabolic complications.[4] So here we focused on complications, adequacy of dialysis, maintainanance of residual renal function by taking the clinical profile of 40 CAPD patients.

Subjects and Methods

The clinical observation were carried from august 2017 to August 2019. All patients of both genders who fulfill the inclusive and exclusive criteria were taken. The study was done at Department of Nephrology IMS and SUM hospital Bhubaneswar. All CAPD patients from different institution were taken. The inclusion criteria was the 40 diagnosed CAPD patient. The exclusion criteria includes patients who were on other modes of RRT for e.g. hemodialysis, Patients who went for renal transplant. CKD5, ESRD patients on CAPD were taken. Consent from the patient as well as ethical committee clearance was taken. All patients were counseled. Patients who were on CAPD, their clinical profile was evaluated and analyzed

In this study following 3 clinical features were studied to look for protein energy wasting (PEW). [International Society of Renal Nutrition and Metabolism (ISRNM) 2008) Body mass (BMI < 23 kg/m2; Unintended weight loss > 5% over 3 months or > 10% over 6 months; Reduced skin fold thickness (> 10% less than 50th percentile for reference population). Peritoneal Equilibrium Test (PET) were done.

Results

The clinical observations were carried from august 2017 to August 2019. All patients of both genders who fulfill the inclusive and exclusive criteria were taken .The study was done at Department Of Nephrology IMS and SUM hospital Bhubaneswar. The total numbers of patients were 40.

Table 1: Distribution of study population according to Age and Sex

Age Group (Mean Age (SD) = 42.93± 14.75years)*	Sex		Total (%)
	Male (%)	Female (%)	
10-29	4(44.4)	5(55.6)	9 (22.5)
30-49	15(88.2)	2(11.8)	17 (42.5)
50-69	9(69.2)	4(30.8)	13 (32.5)
≥70	1(100)	0	1 (2.5)
total	29(72.5%)	11(27.5%)	40

In the study population youngest of the patient was 13 years old and oldest was 80 years. one third (42.5%) belonged to the age group of 30-49 years, 32.5% in 50-69 years and 2.5% were above 70 years of age. Mean age of the CAPD patient was 42.93± 14.75. Out of 40 patients 72.5% were male and 27.5% were female. M: F ratio was 26:1.[Table .1].

The clinical profile of patients of CAPD was given in [Table 2].

Clinical Profile	Present (%)	Absent(%)
Nausea	26 (65)	14(35%)
Vomiting	18 (45%)	22(55%)
Decrease Appetite	34 (85%)	6(15%)
Effort Intolerance	37 (92.5%)	3(7.5%)
Dyspnoea	26 (65%)	14(35%)
Bone Pain	16 (40%)	24(60%)
Uremic Bleeding	10 (25%)	30(75%)
Hemoptysis	6 (15%)	34(85%)
Pruritus	16 (40%)	24(60%)

Table 2: The clinical profile of patients.

Table 3: Distribution of study population according to presence of comorbidities

Age group In yrs	DM		Hypertension		Heart diseases	
	Present %	Absent %	Present %	Absent %	Present	Absent %
10-29	0 (0)	9 (28.1)	6 (19.4)	3 (33.3)	1 (9.1)	8 (27.6)
30-49	2 (11.8)	15 (46.9)	13(41.9)	4 (44.4)	5 (45.5)	12 (41.4)
50-69	5 (38.5)	8 (25)	11(35.5)	2(22.2)	4(36.4)	9 (31)
≥70	1 (12.5)	0	1(3.2)	0	1 (9.1)	0
total	8 (20)	32 (80)	31(77.5)	9(22.5)	11 (27.5)	29 (72.5)

Table 4: Nutrition in CAPD patients

Age group	Reduced skin fold thickness (< 10% less than 50th percentile for reference population	Weight loss < 10% over 6 months
10-29	4(44.4)	4(44.4)
30-49	10(58.8)	7(41.2)
50-69	6(46.2)	4(30.8)
≥70	1(100)	1(100)
total	21(52.5%)	16(40%)

In the studied patient the hemoglobin was well maintained.6% had mild pallor,45% had moderate pallor. Severe pallor was seen in 40% cases [Table 5].

Table 5: 25 Hydroxy vitamin D in CDK3,4 and CDK5

Pallor	Number (%)
Mild	6 (15%)
Moderate	18 (45%)
Severe	16 (40%)

BMI was well maintained in 67.5%.as per BMI < 23 which is an indicator of protein energy wasting was present in only 32.5%.Non was obese. BMI ranges from 17 to 28.5 with mean of 23.7 ± 2.63 [Table. 6].

Table 6: Proportion of BMI in CAPD patients

BMI	Number (%)
18-23	13(32.5%)
≥ 23-30	27 (67.5%)
≥30	0

Table 7: Distribution of study population according to D/P2cr with Age

Age Group In yrs	D/P2 Cr		Total(%)
	<0.5	≥0.5	
10-29	4(44.4)	5(55.6)	9 (22.5)
30-49	8(47.1)	9(52.9)	17 (42.5)
50-69	5(38.5)	8(61.5)	13 (32.5)
≥70	1(100)	0	1 (2.5)
Total	18(45%)	22(55%)	40

Table 8: Association of Edema with D/P2cr

D/p2cr	EDEMA		Chi Square Test
	Present(%)	Absent(%)	
<0.5	7 (31.8)	15 (68.2)	$\chi 2$ =16.17 P=0.001 OR=26(4.01 - 121.18)
≥0.5	17 (94.4)	1 (5.6)	

Edema is significantly (p<0.001) associated with low D/P2cr (i.e ≥ 0.5).Patients with high D/P2cr value have1 26 times more chance of developing edema than those of with high value which is found statistically significant in chi-square test and binary logistic regression [Table. 8].

Table 9: Distribution of study population according to KT/V with different age group

AGE GROUP in yrs	KT/V				
	<1.7	1.7 – 3.4	3.5 -5.1	>5.1	Total
10-29	2(22.2%)	0	2(22.2%)	5(55.3%)	9
30-49	1(5.9%)	5(29.4%)	9 (52.9%)	2(11.3%)	17
50-69	1(7.7%)	4(30.8%)	6 (46.2%)	2(15.4%)	13
≥70	0	1(100%)	0	0	1
Total	4 (10%)	10(25%)	17(42.5)	9(22.5)	40

Table 10: Association of Peritonitis with RKF

RKF	Peritonitis		CHI Square Test
	Present(%)	Absent(%)	
≤ 6	5 (62.5)	(37.5)	$\chi 2$ =9.17 P=0.006 Or=11.66(2.95 - 68.76)
>6	4 (12.5)	28 (87.5)	

** RKF value ranges from 3 to 15 with Mean (SD) = 8.85± 2.94.

Peritonitis is significantly (p<0.05) associated with RKF. Patients with lower RKF value i.e ≤ 6 have 11.66 times more chance of developing peritonitis than those of higher RKF value which is found statistically significant in chi-square test and binary logistic regression [Table.10].

Discussion

Of the 40 patients included in study 72.5% were male and 27.5% were female. Male to female ratio was 2.63:1 .In the study patients youngest patient was 13 years old and oldest was 80 years old. Among them 42.5% belonged to the age group of 30-49 years, followed by 32.5% in 50-69 years age group and least (2.5%) were aged 70 years and above. Mean age (SD) of the population was 42.93± 14. Among the various factors 35% preferred CAPD due to difficulty in coming from remote places, expenditure of travel and hospital stay. In 25% cardiovascular morbidity was an important cause in which CAPD is preferred . In 32.5% cases due to lack of responsible male attendants to bring them hospital repeatedly for hemodialysis they went for CAPD. In 27.5% cases all vascular accesses were exhausted, so they had to go for CAPD as they had no transplant option due to lack of suitable donor.

This findings are consistent with various studies done in India only 8% of PD patients are initiated on PD directly, 92% are shifted after being on HD for a mean duration of about 6 months.[1] According to Prowant BF et al published in Current trends in the use of peritoneal dialysis catheters.[5]Globally, the most widely used catheter (> 90%) is the standard Tenckhoff catheter, followed by the swan neck catheter.[6] In our study most common comorbid condition associated was found to be hypertension (77.2%) followed by heart disease (27.5%) and DM(20%).Most of the co morbidities were more prevalent in 30 -49 years age group.

In CAPD patients BMI was well maintained in 67.5%.as per BMI < 23 which is an indicator of Protein Energy Wasting ,was present in only 32.5%.Non was obese and Out of 40 patients 52%(58% in th age group 30-49%) had well maintained nutrition measured by reduced skin fold thickness (< 10% less than 50th percentile for reference population) and 40%(44.4% in the age group 10-29) had weight loss < 10% over 6 months. It is consistent with the study by Park YK et al which shows 33% of PD patients were malnourished.[7] From all the above clinical profile studies patients on CAPD have better quality of life, nutritional status, correction of anemia and patient survival. The clinical outcomes like adequate ultra filtration, decrease in uremic milieu and adequacy of dialysis were assessed by using Peritoneal Equilibrium Test (PET)and weekly KT/V calculation. Edema was significantly (p<0.001) associated with D/P2cr value (i.e ≥ 0.5).Patients with average, high D/P2cr value have 26 times more chance of developing edema which is found statistically significant in chi-square test and binary logistic regression.

This finding is similar with study by Hambeirgers et al.[8] To calculate the adequacy of dialysis taking various parameters like blood urea nitrogen(BUN),dialysate urea nitrogen(DUN), urinary urea nitrogen(UUN) ,dialysate volume(DV) 24 hours and urine output, weekly KT/V was calculated for each patients. Study at our centre revealed In the age group 10-29 years 22.2% patients have KT/V< 1.7 and 55.5% have KT/V > 5.1,in the age group 30-49 years 5.9% have KT/V <1.7 and 52.9% have KT/V 3.5-5.1,in the age group 50-69 years 7.7% have KT/V <1.7 and 46.2 % have KT/V 3.5-5.1, in the age group ≥ 70 years all have KT/V 1.7-3.4 KT/V score ranges from 1.2 to 7 with mean (SD) 3.88 ± 1.59. Edema was significantly (p<0.05) associated with low KT/V value (i.e <2). Patients with low KT/V value have 13.8 times more chance of developing edema than those of with high value which is found statistically significant in chi-square test and binary logistic regression.[9] In our study out of 40 patients only 22.5% have peritonitis and catheter exit site infections. Most of them were gram positive organisms (90%) and gram negative organisms and fungal peritonitis were found only in 7.5% and 2.5% patients respectively similar to findings of Daugirdas et al. in 2012.[10]

Conclusion

All our clinical profile study and outcome and biochemical

parameters (for e.g. Peritoneal Equilibrium Test, weekly KT/V) used to knowing the adequacy were consistent to results of various national and international studies. About two third patients have mild to moderate pallor requiring ESAs once weekly or every two weekly instead of twice weekly. Our study revealed that edema was significantly ($p<0.001$) associated with D/P2cr value (i.e.≥ 0.5) and low KT/V value (i.e. <2). Also out of 40 patients only 22.5% had peritonitis and catheter exit site infections Peritonitis was significantly ($p<0.05$) associated with increased age, diabetes mellitus and low residual kidney function. Nutritional status measured by BMI, skin fold thickness and weight loss measurement revealed less PEW which is contrary to normal finding of PEW more common in CAPD. Clinical survival, quality of life and correction of anemia was better in our studied CAPD patients.

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