Original Article

Continuous ambulatory peritoneal dialysis in Khyber Pukhtonkhuwa province of Pakistan and adjoining areas of Afghanistan

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Objective

To report the outcome of Continuous ambulatory peritoneal dialysis (CAPD) in End Stage Renal Disease (ESRD) patients from predominately rural areas of Khyber Pukhtonkhuwa (KPK) province of Pakistan and adjoining areas of Afghanistan who had no access to hemodialysis near their localities.

Patients and Methods

This retrospective study was carried out at District Headquarter Teaching Hospital, Dera Ismail Khan and Institute of Kidney Diseases, Hayatabad Medical Complex Peshawar, KPK, Pakistan. All ESRD patients who were initiated on CAPD from January, 2005 to January, 2010 and who had regular follow up were included in the study. Complications and outcome were noted.

Results

A total of 50 patients were analyzed. There were 36 male and 14 female. The mean age was 47.5 years (range 15-80). 43 (86%) patients were from rural area and 3 (14%) from urban area. 38 wepatients took CAPD as their first modality of dialysis while 12 patients choose it as a second modality after being on hemodialysis for some months. The etiology of ESRD were as follows: chronic glomerulonephritis 18 (36.36%), hypertension 12 (27.27%), diabetes mellitus 11 (22.72%), calculus disease 5 (4. 55%), idiopathic 2 (4.55%) and adult polycystic kidney disease in 3 (4.55 %) patients. The total follow up was 642.40 patients-months. Eight patients had Tunnel or exit-site infection, 5 had catheter malposition, outflow failure and abdominal discomfort. There were 30 episodes of peritonitis. There were 53.53 patient-years of experience. The rate of peritonitis was 1 episode per 21.40 patient-months or 0.56 per patient-year. In 4 patients, Tenckhoff catheter had to be removed due to refractory peritonitis within 6 months of insertion. 3 patients had a successful renal transplant. 11 patients switched to hemodialysis due to nonaffordabilty of daily cost of CAPD after 8 months of CAPD. The patient survival at 1, 2 and 3 years was 63.63, 41 and 22 %, respectively.

Conclusions

Continuous ambulatory peritoneal dialysis is better and safe mode of dialysis for remote rural areas of Pakistan and adjoining Afghanistan who have no access to hemodialysis centers in big cities. (Rawal Med J 2012;37:277-281).

Key words

CAPD, Pakistan, peritonitis, Afghanistan.

INTRODUCTION

Continuous ambulatory peritoneal dialysis (CAPD) is an established dialysis modality for end stage renal disease (ESRD) since 1976.[1,2] Since the usage of plastic bags instead of glass bottles by Oreopoulos *et al,* advances in Y-shaped connecting system, flush-before-fill technique and use of ultra bag have made the CAPD technique viable alternative to hemodialysis and easy to use at home.[3] CAPD has advantages of being easy to do at home, liberal intake of proteins and minerals, better control of blood pressure and anemia, and independence from dialysis machines. It has added advantage in haemodynamically unstable patients especially with ischemic heart diseases.[2,4] It has better preservation of residual renal function, better quality of life with greater mobility and low cost.[5] Even with all these advantages, CAPD use is just 15% worldwide, but 93% in Mexico, 51% in United Kingdom, 6 % Japan and 10 % in India.[6] The patients can do CAPD at their home by themself or with help of their family member even in remote rural mountainous areas.

Just like other developing countries in the region and in the world, dialysis is quite expensive and only limited number of patients obtain the treatment of ESRD in Pakistan. Most of the hemodialysis centres are in cities with no access to patients from remote

rural area of Pakistan and adjoining areas of Afghanistan. Therefore, CAPD is a viable option for these patients from remote areas.

PATIENTS AND METHODS

It was a retrospective study of ESRD patients who were started on CAPD from January, 2005 to January, 2010 at DHQ Teaching hospital, Dera Ismail Khan and Institute of Kidney Diseases, HMC, Peshawar, Pakistan. In all the patients, there was no defined criterion for starting CAPD. Those patients were included who chose the CAPD after intense counselling and discussion with them and the family and being in remote rural areas and difficult access to hemodialysis. Those who had previous abdominal surgery or had hernias and unsuitable for Tenckhoff catheter insertion were excluded.

The swan neck Tenckhoff in dwelling silicone double cuffed catheters were implanted surgically under local anesthesia. After break-in-period of 2 weeks, CAPD was started by using Fresenius Stay Safe twin-bag systems with 3-4 daily exchanges of 2 L each are being routinely used. The patient or two close family members was trained about the procedure for at least one week. All were followed every 4-8 weeks in the outpatient clinic and is asked to report to the hospital if the PD fluid becomes turbid or if abdominal pain, vomiting, or diarrhea or some problem in or outflow of fluids occurred. Peritonitis was diagnosed on clinical features (fever, pain abdomen, vomiting or diarrhea) and PD fluid cytology (white blood cells >100/mL and neutrophils >50%), and microbiologic (Gram stain or culture) criteria.[7]

RESULTS

A total of 50 patients were analyzed. There were 36 male and 14 female. The mean age was 47.5 years (range 15-80). 11 patients were from adjoining rural areas of Afghanistan and 39 patients were from Pakistan. A total of 43 (86%) patients were from rural area and 7 (14 %) from Pakistan urban area. 38 patients took CAPD as their first modality of dialysis while 12 patients choose it as a second modality after being on hemodialysis for some months (Table1). Chronic glomerulonephritis, hypertension and diabetes mellitus were leading causes of ESRD (Table 2). The total follow up was 642.40 patients-months.

Table 1. Demographic characteristics of the patients.

Total Number of patients	50
Pakistan	39
Afghanistan adjoining rural area)	11
Rural area (Pakistan and adjoining areas of Afghanistan)	43(86%)
Urban area (all from Pakistan)	7(14%)
Male	36
Female	14
Mean age	47.5 years (15-80 years)
CAPD as First Dialysis Modality	38
CAPD as Second Dialysis Modality	12

Eight patients had Tunnel or exit-site infection, 5 had catheter malposition, outflow failure and abdominal discomfort. There were 30 episodes of peritonitis. There were 53.53 patients-years of experience. The rate of peritonitis was 1 episode per 21.40 patient-months or 0.56 per patient-year during the treatment period. The most common infecting organisms were gram positive in 10 patients and 4 patients with gram negative pathogens (Table 3).

Table 2. Etiology of End Stage Renal Disease.

Etiology	Number	Percentage
Chronic Glomerulonephritis	18	36%
Hypertension	12	24%
Diabetes Mellitus	11	22%
Calculus Diseases	05	10%
Adult Polycystic Kidney Disease	03	6%
Idiopathic	02	4%

The CAPD-related infections were more common in patients who had age > 60 years. All the exit site, tunnel infections and peritonitis were treated by recommended antibiotics according to ISPD guidelines. In 4 patients Tenckhoff catheter was removed due to refractory peritonitis within 6 months of insertion.

Table 3. Clinical characteristics of CAPD patients.

Total follow-up Months	642.40
Total episode of peritonitis	30
Total patient-years experience	53.53
Rate of peritonitis Per Patients-month Per Patient-year	 1 episode per 21.40 0.56
PD fluid culture positive	14
Gram-positive pathogens	10
Gram-negative pathogens	04
Culture negative patients	16
HBs Ag Positive	06
Anti HCV antibody Positive	02

Three patients had a successful renal transplant. 11 patients switched to hemodialysis due to nonaffordabilty of daily cost of CAPD after 8 months. 6 patients were HBsAg positive and 2 were anti HCV antibody positive before putting on CAPD. 16 patients died after a mean duration of 15.4 months. The cause of death in 13 patients was cardiovascular events and all of them were above 60 years of age. 9 of these 13 patients were switched from hemodialysis to CAPD. Three patients died of septicaemia due to peritonitis refractory to treatment. The patient survival at 1, 2 and 3 years was 63.63,41 and 22 %, respectively.

DISCUSSION

In Pakistan the management of ESRD patients is quite expensive like other developing countries in the region. Almost all the ESRD patients are put on hemodialysis and all the hemodialysis centres are in cities with limited access to patients from remote rural areas especially in KPK and adjoining areas of Afghanistan. These areas have a huge population of 35-40 millions with most of the areas are mountainous and difficult terrains.

Our study showed that there is reasonably good survival of ESRD patients on CAPD even from remote rural area which is comparable to other studies in patients on hemodialysis and in urban settings.[8-10] The CAPD in these patients were cost effective as compared to hemodialysis if we consider the cost of travel from these areas to hemodialysis centres in cities, stay in hospital or hotel, food cost and loss of work hours of the accompanying persons. Traditionally, in our society almost half of the family members travel with patient each time they come to hospital. Therefore,, CAPD is cost effective with favourable clinical outcome.[9,10]

Like other studies in the world, peritonitis was the most common problem encountered in these patients. The rate of peritonitis in our study was one episode per 21.40 patient-months or 0.56 episodes per patient-year during the study. This is quite similar to rate of peritonitis (one episode in 22-26 patient-months) reported in major centres of India with similar socioeconomic conditions.[11] Our peritonitis rate are also the almost the same according to ISPD Guidelines- one episode per 18 patient-months or 0.67 episode per patient-year.[12] All of the patients from adjoining areas of Afghanistan had episode of peritonitis because of less better socioeconomic, climatic, hygienic and less literacy background as compared to patients from rural areas of Pakistan.[13,14] Therefore, these patients need more intense PD training, education and more frequent follow-up to reduce the rate of peritonitis. Not only is peritonitis the leading cause of technique failure, but it also contributes to mortality.[15-18] Three patients died of severe peritonitis as they reported late to hospital and all were from Afghanistan with ages more than 60 years.[19-21] The cardiovascular disease was the most common cause of death in 13 patients in our study, vasular events in patients with ESRD cause more than 50% mortality in these patients.[22] Chronic renal failure alone is now an independent cardiovascular risk factor.[23]

Our patients had longer survival in those who were started CAPD as their first dialysis treatment than those that are switched from hemodialysis.[24] Therefore, anuric patients on CAPD with loss of residual renal function had adverse clinical outcome.[25] In our study, the patient survival at 1, 2 and 3 years was 63.63,41 and 22 %, respectively.

The reasons for the low use of CAPD in Pakistan are mutifactorial. Usually, patients are referred late to nephrologists when there is no time for counselling regarding options for dialysis modalities. The nephrologists trained in CAPD are less and there is

no residency programmes for training of young nephrologists. Most senior nephrologists who are not trained in CAPD have a great bias regarding CAPD. They consider it second-line of dialysis modality which demands more dedication and time. There are no financial benefits in doing CAPD for the nephrologists who mostly have their private hemodialysis set up. There is no national programme from the government for CAPD in Pakistan and they support only hemodialysis programme which is almost free in Punjab province of Pakistan. Pakistan society of Nephrology & ISN had never arranged a course or education programme in CAPD for nephrologists in order to spread the use of this modality. Even candidates in post graduate examinations in field of nephrology do not get CAPD material and patients for their examinations. The cost of PD is quite high in Pakistan as compared to India where local and international companies like Baxter manufacture PD solutions locally with low cost.

Although this study has its own limitations due to retrospective analysis and further studies can be done in this regard. But the data of outcome of CAPD in remote rural area of Pakistan and adjoining Afghanistan will help in future establishment of any CAPD programme in Pakistan.

CONCLUSION

Continuous ambulatory peritoneal dialysis is a viable mode of dialysis in ESRD patients in remote rural areas of Pakistan & Afghanistan. CAPD can have good outcome if patients are selected properly, proper PD training and education is provided to nephrologists and healthcare providers as well as patients and their family members. Cost of PD solutions needs to be low and Government should start CAPD programme and support the patients as well nephrologists and healthcare providers with some reimbursement.

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