

Original Article

Effect of an Educational Program on Awareness about Peritoneal Dialysis among Patients on Hemodialysis

Ali Ghafari¹, Nariman Sepehrvand¹, Sanaz Hatami², Elham Ahmadnejad³, Barzan Ayubian², Robab Maghsudi⁴, Catauon Kargar²

¹Urmia University of Medical Sciences, ²Imam Khomeini Training Hospital, Urmia, ³Tehran University of Medical Sciences, Tehran, ⁴Iran University of Medical Sciences, Tehran, Iran

ABSTRACT. Several years after the initial usage of continuous ambulatory peritoneal dialysis (CAPD), the percentage of patients using this continues to be very low constituting about 15% of all patients with end-stage renal disease (ESRD). In this study, we attempt to define the impact of an educational program for improving the use of CAPD. This is a quasi-experimental study (before-after) conducted with educational materials including workshop, teaching by booklet and showing educational films, performed in Urmia, Iran. We designed a questionnaire for data collection and enrolled 160 patients with an aim-based sampling method. We used descriptive statistics and Friedman test for analysis in SPSS software version 11.5. The overall patients' information about CAPD defined by total scoring was as follows: 75% had little information; 19% had moderate information and 6% of patients were well informed. All the information levels increased after intervention. Our study suggests that the poor utilization of CAPD is due to relative unawareness about PD and/or lack of adequate facilities.

Introduction

Progressive increase in the number of patients with end-stage renal disease (ESRD) is a noticeable problem in modern medicine. The reported incidence of ESRD is 268 per million population (pmp) per year, in 1996 in the United States.¹

The population of patients with ESRD amounts

Correspondence to:

Nariman Sepehrvand, MD
Students' Research Committee,
Urmia University of Medical Sciences,
Urmia, West-Azerbaijan, Iran
E-mail: nariman256@gmail.com

to about 30,000 in Iran, of whom almost 15,000 are on dialysis and the remaining, are transplant recipients. Although peritoneal dialysis (PD) was introduced in Iran in 1996, only four percent of ESRD patients are currently on treatment with PD.² Patients with ESRD require some kind of renal replacement therapy for survival in the form of renal transplantation or dialysis (hemodialysis or PD). Deciding about which of these options is best suited to an individual patient depends on his/her residual renal function and imparting suitable education to the patient about the modalities available, thus making it easier to the patient and the treating doctor in making a decision about the mode of replacement therapy, which would

provide maximum benefit and the best quality of life to the patient. Although renal transplantation is the ideal renal replacement therapy, most of the time, it is not feasible and dialysis becomes inevitable.³

Peritoneal dialysis (PD) offers the following advantages over hemodialysis (HD): no need for heparin therapy, no need for vascular access, patient's vascularity is kept intact, there is gradual filtration of blood, hemodynamic and metabolic stability is maintained, there is better control of blood pressure, complications due to frequent blood transfusion such as viral hepatitis are low, and lower costs (personal or governmental expenditure to provide the required facilities or dialysis machines).

Also, the possibility to perform dialysis by himself/herself at home, without any dependence on hospital, which results in gaining more self confidence, are some other advantages of PD. Despite all these advantages, long-term persistent involvement in dialysis during the day, peritonitis, missing opportunity to communicate with others (patients, nurses), probable isolation, high risk for protein malnutrition especially in abandoned elderly patients are some problems and disadvantages of PD.⁴⁻⁶

Considering the increase in the number of ESRD patients, financial aspects should be borne in mind while deciding about the various therapeutic options. There are costs related to purchase and maintenance of HD machines. On the other hand, requirement of a separate outpatient clinic, a few dedicated nurses and the need for an educational program, are some expenditure unique to PD.¹

In a study in Belgium, the mean real cost of HD for each patient, was 1.13 million Belgium Franks (BF) per year, which included cost of personnel, machines and disposables such as membrane, filter, tube and dialysate fluid. However, the cost of PD was approximately 702,520 BF a year, which included the dialysate liquid and nursing team. Lower requirement of erythropoietin (EPO) in PD patients compared with HD saves about 2,08,000 BF per patient per year.⁷

Utilization of PD has been reported to be very low worldwide, and with some variations, in-

cludes approximately 15% of ESRD patients.⁷ There are about 3000 patients on PD in Iran, which forms 8% of Asian dialysis population.^{2,8}

More recently, in most of the Western countries, the number of patients on PD is growing in a rapid manner; however, despite many decades since PD was first introduced, it has not been able to establish its own place, yet.⁹ Utilization of PD in Urmia began in 1999, and we currently have 24 patients on this modality of renal replacement therapy.

This study was conducted to study and evaluate the effect of PD educational programs on increasing knowledge of ESRD patients about the use of CAPD.

Materials and Methods

The study design was quasi-experimental and before-after, conducted on patients on HD. The sampling was aim-based and all patients on HD (n=160) were enrolled. The intervention was a PD educational program which included educational films, brochures and booklets on CAPD, which were supplied by the research group to the subjects of study.

We designed a questionnaire as pre-test and post-test to investigate the effect of this intervention. To evaluate the questionnaire's validity, we first tested it in five patients and subsequently, the queries were adjusted.

The designated questionnaire had two parts: the first part consisted of patient's demographic information and included four questions pertaining to determination of the socioeconomic status of the patient. The second part of the questionnaire evaluated the knowledge of patient about PD. The number of correct answers to each question determined the knowledge status about PD. Knowledge was categorized into three levels; low, moderate and high. Subjects with a knowledge score of 0-33 were considered as low, 34-66 was considered as moderate, and more than 67 was considered as high. Queries were encoded and fulfilled before, and a day after the education.

We used descriptive statistics and Friedman test in SPSS software version 11.5. $P < 0.05$ was considered significant.

Table 1. Knowledge status about peritoneal dialysis in different sex groups before and after education.

Sex	Weak				Moderate				Good			
	Before		After		Before		After		Before		After	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Female	57	78.1	41	56.2	9	12.3	19	26	7	9.6	13	17.8
Male	69	79.3	46	52.9	8	9.2	28	32.3	10	11.5	12	13.8

Results

Among the 160 HD patients studied, 73 were females (45.6%) and 87 were males (54.4%). Twenty-one patients (13.1%) were younger than 35 years, 100 (68.8%) were 35-70 years old and 29 (18.1%) were older than 70 years.

We assessed the knowledge of subjects covering the following areas:

a) How to perform a peritoneal dialysis (before and after education):

Before: 117 (73.1%) had little information, 23 (14.4%) were moderate and 20 (12.5%) were well informed.

After: 80 (50%) had little information, 54 (33.8%) were moderate and 26 (16.3%) were well informed.

b) Knowledge about equipments required for PD:

Before: 113 (70%) had little information, 30 (18.8%) were moderate and 18 (11.3%) were well informed.

After: 77 (48.1%) had little information, 59 (36.9%) were moderate and 24 (15%) were well informed.

c) Knowledge about advantages and disadvantages of PD:

Before: 134 (83.8%) had little information, 18 (11.3%) were moderate and eight (5%) were well informed.

After: 103 (64.4%) had little information, 42 (26.3%) were moderate and 15 (9.4%) were well informed.

d) General knowledge of HD patients about PD:

Before: 126 (78.8%) had little information, 17 (10.6%) were moderate and 17 (10.6%) were well informed.

After: 100 (62.4%) had little information, 38 (23.8%) were moderate, and 22 (13.8%) were well informed.

Knowledge status among males and females was evaluated before and after education and the results are shown in Table 1. Friedman analysis was used to determine whether the influence of gender on knowledge status is significant or not. The comparison of knowledge about PD, before and after education, among the two gender groups was significant ($P = 0.000$).

The knowledge status, before and after education, in different age-groups is shown in Table 2. Relationship between age and knowledge status was significant in all three age-groups; younger than 35 years ($P = 0.000$), 35-70 years ($P = 0.000$) and > 70 years group ($P = 0.04$).

The knowledge status about PD in groups with different literacy levels is shown in Table 3. According to Friedman analysis, correlation between knowledge status and literacy level was significant in all three groups (in low literacy group, $P = 0.000$ and in high literacy group, $P = 0.046$).

The knowledge status about PD, before and after education, in groups with different socio-economical conditions is shown in Table 4.

According to Friedman analysis, the relationship was significant in all three groups (in groups with low and average income, $P = 0.000$, and in those with high-income, $P = 0.002$).

Table 2. Knowledge status about peritoneal dialysis in different age-groups before and after education.

Age	Weak				Moderate				Good			
	Before		After		Before		After		Before		After	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
< 35 years	14	66.7	4	19	9	14.3	11	52.4	4	19	6	28.6
35-70 years	88	80	65	59.2	13	11.8	31	28.1	9	8.2	14	12.7
> 70 years	24	82.8	19	56.6	1	3.4	5	17.2	4	13.8	5	17.2

Table 3. Knowledge status about peritoneal dialysis according to literacy status before and after the education.

Literacy	Weak				Moderate				Good			
	Before		After		Before		After		Before		After	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Illiterate	63	82.9	48	63.2	6	7.9	17	22.4	7	9.2	11	14.4
Under-graduate	58	76.3	39	51.4	8	10.5	25	32.8	10	13.2	12	15.8
Higher Education	5	62.5	1	12.5	3	73.5	5	62.5	0	0	2	25

Discussion

Selecting a kind of replacement therapy for ESRD patients requires a precise informed decision-making by the patient and physician and should consider maximum advantages and minimum disadvantages. Having appropriate and adequate knowledge enables patients who are to be started on dialysis treatment, to choose a therapy according to their own preferences and compatible with their life conditions.¹⁰

In a study by Gomez et al, the standard information package, used as a patient education program, effectively resulted in patients having a significantly improved level of knowledge and understanding of ESRD and the different treatment options available.¹¹

Other studies reveal that PD offers some advantages for the increasing number of elderly patients with ESRD such as hemodynamic stability, steady state metabolic control, good control of hypertension, independence from hospital visits and avoidance of repeated vascular accesses thereby improving the quality of life in all age-groups.⁵

In a study by Juergensen et al, education results in an improvement in compliance of patients for dialysis. It was noted that more than half of the patients had a compliance rate (CR) < 95%; after the education, 83% of 42 patients, had a CR \geq 95%.¹²

Despite early beginning of PD in Iran in 1996, the number of patients who are utilizing this modality of RRT is very low compared with other countries.⁷

The reason could be due to the following two groups of factors:

- Patient factors: economical, social, cultural and health condition, knowledge about therapeutic modalities available and their methods of performance as well as the background disease.
- Factors related to the medical system including medical staff (nephrologists and nursing) and knowledge of this group and supporting systems about peritoneal dialysis.

The results of this study show that the knowledge of HD patients about required equipments, method of performance and advantages and disadvantages of PD is very low and this improved significantly after imparting the educational program.

In general, educational interventions for enhancing knowledge of patients or medical staff could be effective in the development of PD. We suggest a similar study to increase knowledge among medical staff about PD. A permanent educational program for HD patients in all HD departments of the country is recommended, because the benefit of education is undeniable.

Table 4. Knowledge status about peritoneal dialysis according to the socio-economic status before and after education.

Socioeconomic status	Weak				Moderate				Good			
	Before		After		Before		After		Before		After	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Low-income	68	86.1	50	63.3	6	7.6	19	24.1	5	6.3	10	12.6
Moderate	32	71.1	21	42.6	8	17.8	16	36.7	5	11.1	7	16.7
High-income	26	72.2	16	44.4	3	8.3	12	33.3	7	19.4	8	22.2

Acknowledgement

The authors would like to thank Urmia University of Medical sciences for the grants provided for our study.

References

1. van Biesen W, Vanholder R, Lameire N. The role of peritoneal dialysis as the first-line renal replacement modality. *Perit Dial Int* 2000; 20(4):375-83.
2. Pendse SS, Ajay S. Approach to patients with chronic kidney disease, Stage 1-4. In: Daurgirdas JT, Blake PG, Ing TS, eds. *Handbook of dialysis Fourth Edition*. Philadelphia: Lippincott Williams & Wilkins. 2006:7.
3. Singh AK, Brenner BM. Dialysis in the Treatment of Renal Failure. In: Kasper DL, Braunwald E, Fauci AS, et al., eds. *Harrison's Principles of Internal Medicine*. 16th ed. New York: McGraw-Hill 2005:1663-7.
4. Blake PG. Peritoneal dialysis in Asia: an external perspective. *Perit Dial Int* 2002;22(2): 258-64.
5. Dimkovic N, Oreopoulos DG. Chronic peritoneal dialysis in the elderly. *Semin Dial* 2002; 15(2):94-7.
6. Heaf JG, Løkkegaard H, Madsen M. Initial survival advantage of peritoneal dialysis relative to haemodialysis. *Nephrol Dial Transplant* 2002;17(1):112-7.
7. Wuerth DB, Finkelstein SH, Schwetz O, Carey H, Kliger AS, Finkelstein FO. Patients' descriptions of specific factors leading to modality selection of chronic peritoneal dialysis or hemodialysis. *Perit Dial Int* 2002;22(2):184-90.
8. Lo WK. What factors contribute to differences in the practice of peritoneal dialysis between Asian countries and the West? *Perit Dial Int* 2002;22(2):249-57.
9. Blake PG. Economics, focus on pre-dialysis may help stabilize peritoneal dialysis in Canada. *Nephrol News Issues* 2002;16(5):56-8.
10. Castro MJ, Celadilla O, Muñoz I, et al. Home training experience in peritoneal dialysis patients. *EDTNA ERCA J* 2002;28(1):36-9.
11. Gómez CG, Valido P, Celadilla O, Bernaldo de Quirós AG, Mojón M. Validity of a standard information protocol provided to end-stage renal disease patients and its effect on treatment selection. *Perit Dial Int* 1999;19(5):471-7.
12. Juergensen PH, Gorban-Brennan N, Finkelstein FO. Compliance with the dialysis regimen in chronic peritoneal dialysis patients: utility of the pro card and impact of patient education. *Adv Perit Dial* 2004;20:90-2.