Assisted Peritoneal Dialysis: Experience in a Taipei Renal Department

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Abstract

BACKGROUND: Peritoneal dialysis (PD) at home is an appropriate modality of treatment for frail elderly patients with end-stage renal disease (ESRD). However, barriers to PD therapy are also more common among the elderly. In Taiwan, families are allowed to hire foreign caregivers if their sick members need 24-hour care. Assistance provided by foreign caregivers may help overcome the barriers to self-care PD and expand the use of PD.

METHODS: We describe our experience with PD assistance provided by foreign caregivers in a Taipei renal department. This is a retrospective study of 368 incident ESRD patients who started dialysis in our department between September 2006 and December 2008. The follow-up period ended on June 30, 2009. All incident dialysis patients were educated about the different dialysis modalities by an experienced PD nurse. If a patient chose PD but homecare assistance was required, then a program of assisted PD was started, which included rigorous training in PD techniques for family members or foreign caregivers as well as supervision and support.

RESULTS: Among the 154 patients who chose PD, 77 were treated with assisted PD (28/77 by foreign caregivers and 49/77 by family members) and 77 were treated with self-care PD. Although PD patients assisted by foreign caregivers were significantly older (76 ± 9 years) than those assisted by family members (66 ± 12 years; \( P < 0.05 \)) and self-care PD patients (55 ± 11 years; \( P < 0.05 \)), they had a significantly lower peritonitis rate (1/120.1 patient-months) compared with those assisted by family members (1/39.9 patient-months, \( P < 0.05 \)) and self-care (1/66.1 patient-months, \( P < 0.05 \)).

CONCLUSIONS: Assisted PD provided by foreign caregivers had a very low peritonitis rate. The availability of homecare assistance from foreign caregivers may increase the proportion of elderly patients who are eligible for PD. (Acta Nephrologica 2011; 25: 50-53)

KEY WORDS: assisted PD, peritoneal dialysis, peritonitis

Introduction

The use of peritoneal dialysis (PD) is declining in many regions around the world (1). Many potential factors contributing to this trend have been identified, but barriers to self-care PD in elderly patients may play the most important role (2). The most common barriers for elderly PD patients are decreased strength, decreased manual dexterity, decreased vision, immobility, decreased hearing, and anxiety (3). PD at home is an appropriate method of management for frail elderly patients with end-stage renal disease (ESRD) (4). Providing assistance to support them on PD (i.e. assisted PD) may help overcome these barriers and may increase the proportion of elderly patients who are eligible for PD.

Assisted PD involves identifying and training an individual other than the patient to perform dialysis-
related procedures, such as setting up the cycler, connecting the patient to or disconnecting the patient from a cycler, or doing continuous ambulatory peritoneal dialysis (CAPD) exchanges. Family members or visiting public health nurses can provide home-care assistance. Assisted PD may also be done in nursing homes or other chronic rehabilitation facilities. Evidence from the French PD Registry showed that 56% of French PD patients needed some form of assistance (5). In the French experience, 7% of patients were assisted by family members and 41% were assisted by home-visit nurses.

In Taiwan, families are allowed to hire foreign caregivers (full-time caregivers from other Asian countries near Taiwan, such as Indonesia, Vietnam, or the Philippines) if their sick members need 24-hour care. Assistance provided by foreign caregivers may help overcome barriers to self-care and expand the use of PD. In this article, we describe our experience with assisted PD provided by foreign caregivers in a Taipei renal department. The aim of the study is to report on the possible effects of the need for assistance to conduct PD on peritonitis rate, technique survival and patient survival in a cohort of incident PD patients.

Methods

Study Design and Patient Selection

This is a retrospective study of consecutive ESRD patients who started dialysis in our department between September 2006 and December 2008. The study period ended on June 30, 2009. No exclusions due to early discontinuation of treatment or patient death were made.

All incident dialysis patients were educated about the different dialysis modalities by an experienced PD nurse. If a patient chose PD but homecare assistance was required because of comorbidities, physical disabilities, or psychosocial problems, then a program of assisted PD was started, which included rigorous training in PD techniques for family members or foreign caregivers as well as supervision and support.

Baseline information was obtained from each patient, including age, sex, anthropometric measures, and routine biochemistry data. All laboratory tests were conducted after fasting for a night. Peritonitis was diagnosed if two of the following three criteria were present: [1] abdominal pain, [2] turbid effluent containing polymorphonuclear leukocytes > 100/mL, and [3] a pathogen identified from effluent culture or smear. The incidences of peritonitis were calculated as the total durations of follow-up divided by the number of infectious episodes and are expressed as episode/patient-months.

Statistics

Descriptive statistics included means ± SD for continuous data and percentages for categorical data. For between-group comparisons, Student’s t-test was used for normally distributed data and the Mann-Whitney rank-sum test was used for data that were not normally distributed. Pearson’s Chi-square test was used for frequency measures. Peritonitis rates were compared using the Poisson test. The time intervals to first peritonitis were compared using Kaplan-Meier survival analysis. The risk factors for time interval to first peritonitis were analyzed by a Cox regression model. Statistical analysis was performed using the computer software Statistical Package for the Social Sciences (SPSS 16.0, 2007; SPSS Inc, Chicago, IL). A P value < 0.05 was considered statistically significant.

Results

The baseline characteristics of the patients are shown in Table 1. Of the 368 new ESRD patients during the study period, 154 chose PD. Among these PD patients, 77 were treated with assisted PD (28/77 by foreign caregivers and 49/77 by family members) and 77 were treated with self-care PD. PD patients assisted by foreign caregivers accounted for 18.2% of all PD patients in the series. They were predominantly female (85.7%), and had a mean age of 76 years.

PD patients assisted by foreign caregivers were significantly older than those assisted by family members (66 ± 12 years; P < 0.05) and self-care PD patients (55 ± 11 years; P < 0.05). Patients in the self-care group had significantly higher serum albumin concentrations, a lower prevalence of diabetes, and lower APD utility percentages, but there were no differences among the three groups of patients in terms of factors pertaining to PD adequacy.

PD patients assisted by foreign caregivers had a significantly lower peritonitis rate (1/120.1 patient-months) than those with family assistance (1/39.9 patient-months, P < 0.05) and self-care (1/66.1 patient-months, P < 0.05) (Fig. 1). The peritonitis-free rate was significantly higher in PD patients assisted by foreign caregivers (P < 0.05) (Fig. 2). In the analysis of risk factors for peritonitis, PD assisted by foreign caregivers was the only factor showing significant effect on time intervals to first episodes of peritonitis (P < 0.05). The outcome of the patients is shown in Table 2. The technique failure rate was similar across the three groups of PD patients. However, the survival rate was significantly lower in the PD patients assisted by foreign caregivers. The major causes of mortality were of septic and cardiovascular origin.
In Taiwan, many more ESRD patients receive HD than PD. In an annual report of dialysis in Taiwan, the proportions of HD and PD utilization were 91.5% and 8.5%, respectively (6). The underuse of PD in Taiwan is due to multiple factors, both clinical and non-clinical, that remain to be elucidated. However, the inability of a patient to perform PD exchange independently plays an important role, especially for the increasing number of frail elderly patients.

Assisted PD that was performed by family members or home-visit private nurses has been reported to overcome the barrier for those ESRD patients who cannot perform PD by themselves. In a large study from the French Language Peritoneal Dialysis Registry with 11,744 incident PD patients currently enrolled, 56% of French PD patients (median age of 71 years) need some degree of assistance at home. Among them, 7% are aided by their family members, and 41% are aided by home-visit private nurses (7). In another study from Canada, patients who had access to home-care assistance were 2.6 times more likely to be considered eligible for PD than were patients who did not have such access (8).

The home-care nursing system is not established in Taiwan. Patients with multiple comorbidities or a disability needing 24-hour home-care can hire a foreign caregiver under a physician’s verification. Assisted PD performed by these foreign caregivers is thus an option for those PD patients needing home assistance. Language barrier is the key problem during PD education. Therefore, procedural and educational sheets

### Table 1. Comparison of baseline characteristics of patients with self-care PD, PD assisted by family members and PD assisted by foreign caregivers

<table>
<thead>
<tr>
<th>Variables</th>
<th>Self-care PD (n = 77)</th>
<th>PD assisted by family members (n = 49)</th>
<th>PD assisted by foreign caregivers (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>54.58 ± 11.14</td>
<td>66.35 ± 11.77a</td>
<td>76.18 ± 9.23b,c</td>
</tr>
<tr>
<td>Gender (male %)</td>
<td>61.04</td>
<td>36.73a</td>
<td>14.29b,c</td>
</tr>
<tr>
<td>Diabetes (%)</td>
<td>0.31 ± 0.47</td>
<td>0.67 ± 0.47a</td>
<td>0.86 ± 0.36b</td>
</tr>
<tr>
<td>APD (%)</td>
<td>31.58</td>
<td>48.98a</td>
<td>50.00</td>
</tr>
<tr>
<td>Albumin (g/dL)</td>
<td>3.77 ± 0.39</td>
<td>3.57 ± 0.44a</td>
<td>3.54 ± 0.32b</td>
</tr>
<tr>
<td>Hematocrit (%)</td>
<td>31.39 ± 4.23</td>
<td>31.93 ± 3.28</td>
<td>31.07 ± 4.54</td>
</tr>
<tr>
<td>Renal Kt/V</td>
<td>0.65 ± 0.52</td>
<td>0.58 ± 0.42</td>
<td>0.53 ± 0.49</td>
</tr>
<tr>
<td>Peritoneal Kt/V</td>
<td>1.40 ± 0.45</td>
<td>1.38 ± 0.48</td>
<td>1.53 ± 0.46</td>
</tr>
<tr>
<td>D/P creatinine</td>
<td>0.68 ± 0.14</td>
<td>0.67 ± 0.15</td>
<td>0.66 ± 0.10</td>
</tr>
</tbody>
</table>

a: $P < 0.05$ (PD assisted by family members vs. self-care PD).
b: $P < 0.05$ (PD assisted by foreign caregivers vs. self-care PD).
c: $P < 0.05$ (PD assisted by foreign caregivers vs. PD assisted by family members).

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**Discussion**

In Taiwan, many more ESRD patients receive HD than PD. In an annual report of dialysis in Taiwan, the proportions of HD and PD utilization were 91.5% and 8.5%, respectively (6). The underuse of PD in Taiwan is due to multiple factors, both clinical and non-clinical, that remain to be elucidated. However, the inability of a patient to perform PD exchange independently plays an important role, especially for the increasing number of frail elderly patients.

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The home-care nursing system is not established in Taiwan. Patients with multiple comorbidities or a disability needing 24-hour home-care can hire a foreign caregiver under a physician’s verification. Assisted PD performed by these foreign caregivers is thus an option for those PD patients needing home assistance. Language barrier is the key problem during PD education. Therefore, procedural and educational sheets
were written in different languages to facilitate learning. However, patients and their families are still worried about the safety of PD assistance provided by these foreign caregivers, especially concerning peritonitis. Therefore, we conducted this study to explore the adequacy of PD assistance provided by foreign caregivers.

The results of our study demonstrated that the peritonitis rate of the group with PD assistance provided by foreign caregivers was much lower than that of the family assistance or self-performed group (1/120.1 patient-months vs. 1/39.9 patient-months in the family assistance group, 1/66.1 patient-months in the self-performed group, \( P < 0.05 \)). The peritonitis-free survival was also higher in the foreign caregiver assistance group than in the other two groups (\( P < 0.05 \)). Although the survival rate was significantly lower in this patient group, death was probably due to old age and multiple comorbidities of the patients in the foreign caregiver assistance group rather than PD.

To our surprise, in spite of the language barrier and the lack of professional nursing background, foreign caregivers performed assisted PD with superior safety, as evidenced by the low peritonitis incidence. In the large French study previously mentioned (7), the peritonitis rates for the home-visit nurse assistance group, family assistance group and non-assisted group are 1/36, 1/45 and 1/33 patient-months, respectively. No statistical significant difference was noted. Two possible reasons account for the lower peritonitis rate among patients with PD assistance from foreign caregivers. First, foreign caregivers provide 24-hour care, which can be more sophisticated and broad. Second, they try hard not to make any mistakes in order to preserve their jobs, which offer better salaries than those in their hometowns.

The limitations of our study include its retrospective method. In addition, the burn-out phenomenon on performing PD should be also considered in the assisted PD group. Thus, a prospective study with a longer follow-up period is necessary before making further conclusions or recommendations.

To our knowledge, this is the first study about assisted PD performed by foreign caregivers in Taiwan. Assistance from foreign caregivers provides a new option for those ESRD patients who choose home PD as the permanent dialysis modality but lack self-performing ability. The safety of foreign caregiver assistance is proven by the lower peritonitis rate shown in our study.

Acknowledgments

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References


Table 2. Outcome of patients with self-care PD, PD assisted by family members and PD assisted by foreign caregivers

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Self-care PD (n = 77)</th>
<th>PD assisted by family members (n = 49)</th>
<th>PD assisted by foreign caregivers (n = 28)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remain on PD</td>
<td>66</td>
<td>35</td>
<td>12</td>
</tr>
<tr>
<td>Switch to HD</td>
<td>7</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Death, due to</td>
<td>4</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>PD-related death</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Sepsis</td>
<td>3</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>1</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Others</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

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