Clinical Outcomes in Elderly (More Than 80 Years of Age) Peritoneal Dialysis Patients: Five Years’ Experience at Two Centers

The proportion of elderly people requiring renal replacement therapy has been increasing in Japan. Although several studies have shown the benefits of peritoneal dialysis (PD) in the elderly, few have reported on outcomes, including prognosis, in elderly PD patients, especially those more than 80 years of age. The purpose of the present study was to evaluate clinical outcomes in elderly (more than 80 years of age) PD patients.

We retrospectively evaluated the medical records of elderly PD patients who commenced PD between 2007 and 2011. The frequency of perioperative complications, rate of PD-associated peritonitis, technique survival, overall survival, and utilization of nursing-care insurance systems were investigated as clinical outcomes.

The 12 patients eligible for this study (7 men, 5 women; mean age: 85 ± 3 years) had a median duration of follow-up of 1.2 years (interquartile range: 0.65 – 1.74 years). Perioperative complications were not observed in any of the patients. The frequency of PD-associated peritonitis was 1 episode in 56 months. During follow-up, 6 patients died, and 3 patients switched to hemodialysis because of tunnel infection or lack of family support. The overall survival rate at 12 months was 83%. Nursing-care insurance was used by 63% of patients.

In elderly patients, it is important to predict the potential short-term issues at the initiation of PD to facilitate implementation of social services, such as home-visit nursing-care services, at the time of worsening general condition.

Key words
Geriatric patients, end-stage renal disease

Introduction
As the proportion of elderly people in developed countries rises, the prevalence of elderly patients requiring renal replacement therapy has also been increasing. The number of elderly patients who are independent or able to live at home with the support of family is also increasing. According to a report published by the Japanese Society for Dialysis Therapy in 2010, patients 75 – 79 years of age constituted the highest proportion of those starting dialysis (1).

Several retrospective studies have shown that PD is a reasonable therapeutic modality in elderly patients (2,3), but few reports have examined clinical outcomes in patients who commence PD at more than 80 years of age. The aim of the present study was therefore to evaluate the clinical outcomes of elderly (more than 80 years of age) PD patients.

Methods
We retrospectively evaluated the medical records of elderly PD patients who started PD between 2007 and 2011 at two of our hospitals. The frequency of perioperative complications, the rates of PD-associated peritonitis and switches from PD to hemodialysis (HD), the utilization of the nursing-care insurance system, the overall survival rate, and causes of death were investigated as clinical outcomes. Peritonitis was defined as the presence of cloudy fluid with a white blood cell count exceeding 100/mL, at least half being polymorphonuclear neutrophils. The modified Charlson comorbidity index, which is an important factor not only in patient survival but also in technique survival, was calculated for all patients (2,4).

From: 1Division of Nephrology and Hypertension, Kawasaki Municipal Tama Hospital, and 2Division of Nephrology and Hypertension, St. Marianna University School of Medicine, Kawasaki, Japan.
Results
The 12 patients evaluated (Table I) had a mean age of 85 ± 3.0 years. Median duration of follow-up was 1.2 years (interquartile range: 0.65 – 1.74 years). The mean score on the modified Charlson comorbidity index was 3.1, which is classified as low-to-moderate risk.

Perioperative complications were not observed in any of the patients in our study. The frequency of PD-associated peritonitis was 1 episode in 56 months. That rate was relatively high compared with the rate for all age groups in our hospital, but it was lower than the national average in Japan (5).

Figure 1 shows the clinical course of the patients. Each box represents one patient, and the abscissa shows the number of years after PD start. During follow-up, 6 patients died: 2 of old age, and 1 each of respiratory failure, peritonitis, sudden death, and unknown causes. A switch to HD occurred for 3 patients: 2 were switched because of a lack of family support, and 1, because of a tunnel infection. One patient required hospital-based PD because of a lack of family support.

The overall survival rate at 12 months was 83%; at 24 months, it was 41% (Table II). Nursing-care insurance was used by 63% of the patients—a rate that is relatively high compared with that in other reports (2).

Discussion
The optimal renal replacement therapy for elderly patients is unclear. Several studies in elderly patients have suggested potential advantages for PD over HD, such as hemodynamic stability, lack of a need for vascular access, and independence from the hospital (6). On the other hand, technique failure, peritonitis, and social isolation are major concerns in elderly PD patients. Some studies have suggested that rates of peritonitis are not different between elderly and younger patients. Taveras et al., in their review of 235 patients, reported that the peritonitis rate among patients 75 years of age and older was almost the same as that in patients less than 75 years of age (3). Hiramatsu et al. reported that the incidence of peritonitis did not increase with advancing age in their study of 247 patients (7). In our study, the peritonitis rate in our elderly patients was better than the average for all age groups in Japan. Those findings suggest that there is no need to be overly afraid of the development of peritonitis in elderly patients.

### Table I  Clinical characteristics of the study patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients (n)</td>
<td>12</td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>85±3</td>
</tr>
<tr>
<td>Sex [n (%)] men</td>
<td>7 (58)</td>
</tr>
<tr>
<td>History of [n (%)]</td>
<td></td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>4 (33)</td>
</tr>
<tr>
<td>Malignancy</td>
<td>1 (8)</td>
</tr>
<tr>
<td>Cause of kidney disease [n (%)]</td>
<td></td>
</tr>
<tr>
<td>Hypertensive nephropathy</td>
<td>8 (67)</td>
</tr>
<tr>
<td>Diabetic nephropathy</td>
<td>1 (8)</td>
</tr>
<tr>
<td>Glomerulonephritis</td>
<td>1 (8)</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>2 (17)</td>
</tr>
<tr>
<td>Mean modified CCI score</td>
<td>3.1</td>
</tr>
</tbody>
</table>

CCI = Charlson comorbidity index.

### Table II  Survival rates in elderly patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Survival (%) at 12 Months</th>
<th>Survival (%) at 24 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present study</td>
<td>83</td>
<td>41</td>
</tr>
<tr>
<td>Peritoneal dialysis introduction at</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65–74 Years (2)</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td>≥75 Years (2)</td>
<td>80</td>
<td>70</td>
</tr>
<tr>
<td>≥65 Years and CCI score = 2 (2)</td>
<td>90</td>
<td>85</td>
</tr>
<tr>
<td>≥65 Years and CCI score = 3 or 4 (2)</td>
<td>80</td>
<td>70</td>
</tr>
<tr>
<td>Hemodialysis introduction at</td>
<td>71</td>
<td>—</td>
</tr>
</tbody>
</table>

CCI = Charlson comorbidity index.
The overall 12-month survival rate is reportedly higher with PD than with HD in Japanese patients over 80 years of age (8). Fewer comorbidities in our patients may have contributed to that finding. Our data therefore support the suggestion in other studies that PD is a reasonable therapy choice in elderly patients. In our study, technique survival at 24 months was only 20%. Two patients were transferred to HD because of a lack of family support, and 63% of patients used nursing-care insurance. The Japanese government started a public nursing-care insurance system in April 2000. People more than 40 years of age bear any additional expenses not covered by their public health insurance. People 65 years of age and older are insured and are able to use certain services at home and at other facilities. Unfortunately, the local facilities that are covered by nursing-care insurance support HD patients, but not PD patients. In Japan, the prevalence of PD is only 3.3% across all age groups (1). The therapy is thus not well known even among nurses and helpers.

Conclusions
Many elderly PD patients discontinue PD at home within 2 years after initiating therapy. In elderly patients, it is important to predict short-term issues at the initiation of PD to facilitate early implementation of social services, such as home-visit nursing-care services, at the time of worsening general condition. The introduction of appropriate renal replacement therapy for end-stage renal disease patients and more information about PD for people who provide supportive care to end-stage renal disease patients are required in Japan.

Disclosures
The authors have no financial conflicts of interest to declare.

References

Corresponding author:
Takanori Otowa, MD, Division of Nephrology and Hypertension, Kawasaki Municipal Tama Hospital, 1-30-37 Shukugawara, Tama-ku, Kawasaki, Kanagawa 214-8525 Japan.
E-mail: otowa.taka@gmail.com