Hemodialysis and Peritoneal Dialysis: Patients’ Assessment of Their Satisfaction with Therapy and the Impact of the Therapy on Their Lives

Erika Juergensen, Diane Wuerth, Susan H. Finkelstein, Peter H. Juergensen, Ambek Bekui, and Fredric O. Finkelstein

Hospital of St. Raphael, Yale University and the Renal Research Institute, New Haven, Connecticut

This study was undertaken to examine patient satisfaction with peritoneal dialysis (PD) and hemodialysis (HD) therapies, focusing attention on the positive and negative impact of the therapies on patients’ lives. Patients were recruited from a free-standing PD unit and two free-standing HD units. A total of 94% (n = 62) of eligible PD and 84% (n = 84) of eligible HD patients participated. HD patients were significantly older and had higher Charlson Comorbidity Index scores than the PD patients, but there were no differences in duration of dialysis treatment, prevalence of diabetes, educational backgrounds, or home situations. Patients were asked to rate their overall satisfaction with and the overall impact of their dialysis therapy on their lives, using a 1 to 10 Likert scale. In addition, patients were asked to rate the impact of their therapy on 15 domains that had been cited previously as being important for patients’ quality of life. The mean satisfaction score for PD patients (6.02 ± 1.41) was higher than for HD patients (7.4 ± 1.4; P = 0.15). PD patients indicated that there was less impact of the dialysis treatment on their lives globally (7.25 ± 2.12 versus 6.19 ± 2.83; P = 0.019). In addition, PD patients noted less impact of the therapy in 14 of the 15 domains examined. With the use of a proportional odds model analysis, the only significant predictor of overall satisfaction and impact of therapy was dialysis modality (P = 0.037 and P = 0.021, respectively). Patients also were asked to comment freely on the positive and negative effects of the dialysis treatments on their lives, and a taxonomy of patient perceptions and concerns was developed. This study suggests that PD patients in general are more satisfied with their overall care and believe that their treatment has less impact on their lives than HD patients.


Comparisons between hemodialysis (HD) and peritoneal dialysis (PD) therapy for patients with ESRD generally have focused on differences in morbidity and mortality between these treatment modalities (1–3). Results of these studies have been inconsistent, with different studies indicating varying results. Problems that often have been cited in interpreting these results relate to issues with patient selection for the different modalities, the differences in comorbidities in patients who select HD and PD, and problems with relative utilization of PD and HD in defined geographic areas (1–4). Providing guidelines and advice for patients in terms of modality selection must rely, to some extent, on factors other than specific details of relative mortality rates of the different therapies.

Recently, it has been recognized that patients’ quality of life and patient satisfaction with care are important domains that need to be understood better and addressed more fully (5–11). This in part is because these domains have been associated with a variety of defined medical outcomes, such as compliance with care, morbidity, and mortality (7–9). Furthermore, satisfaction with care and quality of life are being recognized increasingly as valid end points to assess therapy (10,11).

Few studies have examined patient satisfaction with dialysis therapy (6). Recently, increasing attention has been focused on this area, as investigators have identified patients’ perception of care as an important domain to examine (9–11,12,13). Furthermore, it has been emphasized recently that dialysis patients have strong preferences concerning their therapy (14). This study was undertaken to examine patient satisfaction with PD and HD, focusing attention on the impact of the therapies on patients’ lives.

Materials and Methods

All patients who were receiving dialysis in three of the four dialysis units that are affiliated with the Hospital of St. Raphael were considered to be candidates for participation in the study. To be eligible, patients had to be 18 yr of age or older, maintained on the same dialysis modality for a minimum of 6 mo, fluent in English, and medically stable without acute medical problems for a minimum of 2 mo before the study. In addition, patients who were unable to understand and answer the questionnaires coherently were excluded. The three dialysis units that were involved in the study were (1) New Haven CAPD, a large, free-standing PD unit in New Haven that cares for an average of 100 PD patients and does the PD training and follow-up for all of our groups’ ESRD patients; (2) the Milford Dialysis Unit, a 14-station, free-standing HD unit that cares for 88 HD patients; and (3) Branford...
Dialysis Unit, an eight-station, free-standing unit that cares for an average of 36 patients.

A total of 90% of the dialysis patients were considered to be eligible to participate in the study. A total of 94% of the potentially eligible PD patients and 84% of the potentially eligible HD patients agreed to participate. All questionnaires were distributed by one investigator (E.J.), who was not affiliated with any of the dialysis units. Questionnaires were given to PD patients at the time of the patient’s monthly appointment and were completed during the patient’s visit. Questionnaires for the HD patients were completed during the dialysis session. When patients had any questions about the meaning of any part of the survey, one investigator (E.J.) was available to provide an explanation of the question to the patient. In addition, when the patient could not read, the survey was read to him or her by E.J.

Basic demographic data were collected on all participating patients. Charlson Comorbidity Index (CCI) scores, using standard methods, were calculated by a detailed review of the medical records and discussion with the primary nephrologist (15,16).

**Questionnaire Development**

The questionnaire (Appendix) was developed by a committee that included two nephrologists, two social workers, one nephrology physician assistant, two dialysis nurses (all of whom had had extensive experience working with HD and PD patients), and one physician assistant student (E.J.) who was not affiliated with the dialysis centers. In developing the questionnaire, committee members used data from previous studies by our group concerning patients’ perceptions of the impact of dialysis therapy on their lives (13,15,16). The questionnaire was designed to focus attention on the patients’ perception of their care and the impact of the dialysis therapy on their overall life as well as specific domains of their life, cited in our previous work, as perceived by patients to be important for their quality of life (13,17,18).

The questionnaire had four major sections. The first section asked patients about basic demographic information. The second section asked about patients’ overall satisfaction with their dialysis therapy and the overall impact of the dialysis treatment on their life. The questions were graded on a scale from 1 to 10, with 10 being the most satisfaction with or least impact of the therapy and 1 being the least satisfaction with and greatest impact of the therapy on their lives. The third section inquired about the impact that dialysis therapy had on specific aspects of the patients’ life, focusing attention on 15 specific domains: Overall health, stress level, family life, social life, independence, finances, mood, religion/spirituality, sex life, energy level, recreation/hobbies, exercise ability, living arrangements, appetite, and body image. The same rating scale was used. The domains used were based on previous interviews that were conducted by two of the investigators (D.W. and S.F.) in which patients had identified the specific domains of their life that were important for them (13,17,18). The fourth section was a free-text section that asked patients to list the three most important positive and three most negative aspects of their dialysis therapy. The questionnaires generally took between 10 and 15 min to complete.

**Statistical Analyses**

Surveys were collected and data were reviewed by three of the investigators (E.J., D.W., and S.F.). Statistical analysis was performed using an SPSS database (SPSS, Chicago, IL). Means were compared between PD and HD using two-sided t test. For investigation of whether CCI scores had an impact on satisfaction scores, a Pearson correlation coefficient was calculated to compare the CCI scores with all domains.

For the free-text answers, all PD and HD patients’ answers were divided into positive and negative responses for each dialysis modality. Responses were grouped into categories on the basis of the judgment of the three reviewers. The primary investigator (E.J.) created the categories after a careful review of individual patient responses; these categories and the individual patient responses were reviewed by two additional investigators (D.W. and S.F.). Consensus was reached as to the appropriateness of each category and the assignment of individual answers into its specified category.

Proportional odds models (Stata, version 8.2; StataCorp, College Station, TX) were estimated using ordered logistic regression with overall satisfaction and overall impact of therapy as outcome variables, adjusting for age, gender, race, comorbidity (CCI), duration of dialysis (in months), presence or absence of diabetes, marital status, education, employment status, living arrangements, and mode of dialysis (PD or HD).

**Results**

A total of 146 patients participated in this study; 84 patients were on HD, and 62 were on PD. Patient demographics, shown in Table 1, indicated that HD participants were older than PD participants. A total of 47.6% of the HD and 51.6% of PD patients had diabetes. The duration of dialysis was not different between the PD and the HD patients. There were no significant differences between the basic demographic data of the HD and PD patients in terms of educational backgrounds or home situations.

HD patients had a mean CCI score of 7.90 ± 1.87, which was significantly higher than the CCI score of the PD patients (5.80 ± 2.68; P < 0.0001). No significant correlation was noted between the CCI score and any of the patient satisfaction or impact scores.

The mean patient satisfaction score for PD patients (8.02 ± 1.41) was higher than that for the HD patients (7.4 ± 1.41), but these differences were not statistically significant on univariate analysis (P = 0.15). The mean score of the questions concerning the overall impact of the dialysis therapy on the patients’ lives was significantly higher for the PD patients (7.25 ± 2.12) than for the HD patients (6.19 ± 2.83; P = 0.019). The scores for the PD patients also were significantly higher than the scores for the HD patients in the following five domains: Family life (6.83 ± 0.71 versus 5.91 ± 2.83; P = 0.032), independence (6.18 ± 0.71 versus 5.14 ± 2.835; P = 0.016), religion/spirituality (7.02 ± 0.71 versus 5.97 ± 1.41; P = 0.006), energy level (5.15 ± 2.12 versus 4.30 ± 4.95; P = 0.035), and living situation (6.70 ± 0.01 versus 5.40 ± 2.12; P = 0.001). The PD scores were higher but not significantly so in terms of impact on stress level, health, social life, activity, energy level, recreation, appetite, and body image. The only domain in which HD patients had higher scores than the PD patients was in terms of sex life, but this difference was minimal (4.15 ± 2.12 versus 4.0 ± 2.83; Table 2).

With the proportional odds model analysis correlating overall satisfaction as outcome variable, adjusting for age, gender, race, comorbidity, duration in months of dialysis, presence or absence of diabetes, marital status, education, employment status, living arrangements, and mode of dialysis, the only variable that was significantly associated with...
The overall satisfaction was mode of dialysis (coefficient 1.0997, \( P = 0.037 \)). The odds ratio for improvement in overall satisfaction score by one ordinal level was 3.003 (95% confidence interval 1.0686 to 8.4412) for PD compared with HD as mode of dialysis. A similar analysis using overall impact of therapy on patients' lives as the outcome variable demonstrated that the only significant predictor was mode of dialysis (coefficient 1.2684, \( P = 0.021 \)), with odds ratio for improvement in overall impact score by one ordinal level of 3.5553 (95% confidence interval 1.2077 to 10.4667).

**Satisfaction Taxonomy**

Patient responses to the free-text portion of the questionnaire concerning the dialysis therapy were codified into positive and negative categories of HD and PD treatment. The most frequently cited categories are summarized in Table 3. The most frequently cited positive categories for HD (in order of highest frequency) were staff interactions, being alive and well, frequency of medical care, social interaction with other dialysis patients, and feeling happier/healthier. The most frequently cited positive categories for PD were being alive and well, feeling happier/healthier, abil-
Table 3. Most frequently cited impacts of dialysis therapy

<table>
<thead>
<tr>
<th></th>
<th>Positive Responses</th>
<th>Negative Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff interaction</td>
<td>(n = 34)</td>
<td>Length of treatment (n = 25)</td>
</tr>
<tr>
<td>Being alive and well</td>
<td>(n = 30)</td>
<td>Needle sticks/access (n = 20)</td>
</tr>
<tr>
<td>Frequent medical care</td>
<td>(n = 17)</td>
<td>Fatigue/weakness (n = 18)</td>
</tr>
<tr>
<td>Social interaction</td>
<td>(n = 15)</td>
<td>Cramping/sick after treatment (n = 19)</td>
</tr>
<tr>
<td>Improved strength/energy</td>
<td>(n = 10)</td>
<td>Frequency of treatment (n = 12)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transportation to unit (n = 12)</td>
</tr>
<tr>
<td><strong>PD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved strength/energy</td>
<td>(n = 23)</td>
<td>Problems with supplies (n = 14)</td>
</tr>
<tr>
<td>Being alive and well</td>
<td>(n = 16)</td>
<td>Frequency/length of treatment (n = 14)</td>
</tr>
<tr>
<td>Do therapy at home</td>
<td>(n = 14)</td>
<td>Bloating/pain (n = 12)</td>
</tr>
<tr>
<td>Do therapy while sleeping</td>
<td>(n = 12)</td>
<td>Interference with sleep (n = 9)</td>
</tr>
<tr>
<td>Increased independence</td>
<td>(n = 9)</td>
<td>Change in daily routine (n = 6)</td>
</tr>
</tbody>
</table>

The PD patients had significantly fewer comorbidities than the HD patients and were significantly younger, confirming findings from other studies (6). The CCI, which was used in our study and has been used extensively in studies of dialysis patients, includes 19 categories of comorbid illness and includes age in the index (15, 16, 20). It is interesting that the CCI did not correlate with any of the patient assessments. Similarly, in the CHOICE study, comorbidity scoring did not have an impact on patient satisfaction ratings (6).

Our study has some shortcomings. All patients included in the study were cared for by the same physicians, who are part of one group. PD use in this group is high, with >30% of prevalent patients with ESRD being maintained on PD. No patients who were on home HD were included. Because only prevalent patients were studied, it is possible that the results reflect the effect of selection bias; that is, patients who remained on PD were those with better outlooks. Some of the differences between the PD and HD patients could be attributed to modality selection bias; that is, patients with a more positive outlook were more likely to have chosen PD. The questionnaire that was used was developed by the authors and has not been used elsewhere. However, 90% of the patients who were cared for in the three facilities were considered eligible to participate, and between 84 and 94% of eligible patients participated. The patient group seems to be a typical ESRD cohort. The patient satisfaction data are similar to that reported in the CHOICE study, lending support to the validity of the measurements.

Our study suggests that PD patients in general are more satisfied with their overall care and believe that their treatment has less impact on their lives than do HD patients. In addition, a taxonomy of patient perceptions of their care, both positive and negative, has been developed. We think that it is important to extend these observations to a larger cohort of patients and eventually to incorporate this information into education programs for patients with chronic kidney disease to assist with modality selection.
Appendix: Dialysis Survey

Date __________

In this survey, we are asking you about your satisfaction with your dialysis therapy and the impact that the dialysis treatment has had on your life.

1. Please rate your overall satisfaction with your dialysis therapy using the 1 to 10 scale provided, ‘1’ being completely dissatisfied and ‘10’ being completely satisfied.

   1 2 3 4 5 6 7 8 9 10

2. Please rate the overall impact that dialysis has had on your life, ‘1’ being very negative impact, ‘5’ being NO impact, and ‘10’ being very positive impact.

   1 2 3 4 5 6 7 8 9 10

In the questions below, we would like to ask you about the impact that dialysis therapy has had on several aspects of your life. Please rate these questions on the 1 to 10 scale provided, ‘1’ being very negative impact, ‘5’ being NO impact, and ‘10’ being very positive impact.

3. Stress level? 1 2 3 4 5 6 7 8 9 10
4. Overall health? 1 2 3 4 5 6 7 8 9 10
5. Family life? 1 2 3 4 5 6 7 8 9 10
6. Social life? 1 2 3 4 5 6 7 8 9 10
7. Independence? 1 2 3 4 5 6 7 8 9 10
8. Finances? 1 2 3 4 5 6 7 8 9 10
9. Mood? 1 2 3 4 5 6 7 8 9 10
10. Religion/spirituality? 1 2 3 4 5 6 7 8 9 10
11. Sex life? 1 2 3 4 5 6 7 8 9 10
12. Energy level? 1 2 3 4 5 6 7 8 9 10
13. Recreation/hobbies? 1 2 3 4 5 6 7 8 9 10
14. Exercise ability? 1 2 3 4 5 6 7 8 9 10
15. Living arrangements? 1 2 3 4 5 6 7 8 9 10
16. Appetite? 1 2 3 4 5 6 7 8 9 10
17. Body image? 1 2 3 4 5 6 7 8 9 10

Any kind of dialysis treatment can have complications, disadvantages, and negative side effects. Please choose the top three items that bother you most about your dialysis therapy and describe them in the spaces provided.

1. ____________________________
2. ____________________________
3. ____________________________

Dialysis treatment also has positive aspects. Please choose the top three items that you like the most about your dialysis therapy and describe them in the spaces provided.

1. ____________________________
2. ____________________________
3. ____________________________

Comments?

__________________________________________________________

Thank you for completing this survey. It will help us better understand your experience with your dialysis treatment and how we can improve our program.
References