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Original Article

The Impact of Education on Nutrition on the Quality of Life in Patients on Hemodialysis: A Comparative Study from Teaching Hospitals

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ABSTRACT. Patients on maintenance hemodialysis (MHD) experience decreased quality of life (QoL) and significantly higher rates of malnutrition, inflammation, hospitalization and mortality when compared with the normal population. The dietary approach in the different phases of chronic renal failure is one of the most important, and yet controversial, topics in the whole history of nephrology, even when dialysis facilities were not easily available. Although much progress has been made in recent years in recognizing the link between malnutrition, different diseases and increased mortality, no consensus has yet been reached concerning the ideal assessment and management of nutritional status in dialysis patients in Iran. In this study, 70 patients on MHD in the teaching hospitals in Urmia were divided into two groups and were requested to fill in the validated SF-36 QoL questionnaire. One group of 35 patients received dietary counseling while the other did not and acted as controls. The SF-36, a short-form QoL scoring system consists of 36 questions that are compressed into eight multi-item scales covering all aspects of QoL. The two groups studied were similar in age, level of education, gender and duration of dialysis treatment; 46.8% of the patients were female and 52% were male. The total SF-36 score was slightly higher in males compared with females, but this difference was not statistically significant ($P = 0.05$). The scores were higher in the group counseled about diet. Overall, the difference in physical health, in work activities and QoL as a whole, between the two groups, was statistically significant ($t = 2.04$, $df = 34$, $P = 0.049$; $t = 2.04$, $df = 34$, $P = 0.049$; $t = 2.28$, $df = 1.96$, $P = 0.043$, respectively). The QoL was considerably diminished in HD patients, but less so in the group that was educated about their nutrition. Improvement in QoL is achievable in patients if their discomfort is more effectively treated medically. One of the methods for this is education about their nutritional program, which can be used for other chronic diseases too. More research is needed to assess whether interventions help to improve QoL and lower heath risks among patients on HD.

Introduction

Every year, many patients with chronic kidney disease progress to maintenance hemodialysis (MHD) and begin renal replacement therapy worldwide. Poor nutritional status is a well-documented consequence of chronic kidney disease, even before dialysis became widely available. Nutritional assessment is an essential clinical procedure in the management of these patients; it is now recognized as an important predictor of the prognosis for patients starting

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dialysis. An alteration in anthropometric parameters is found in 70% and severe malnutrition in 25% of dialysis patients.[1] Because the availability of kidney transplants is limited, most patients are put on MHD, usually performed at a dialysis center.

Patients on MHD experience decreased quality of life (QoL) and significantly higher rates of malnutrition, inflammation, hospitalization and mortality compared with the normal population. The dietary approach in the different phases of chronic renal failure is one of the most important, and yet controversial, topics in the whole history of nephrology, even when dialysis facilities were not easily available. Malnutrition has also been cited as a possible contributory factor toward poor prognosis in patients. The positive psychological and social aspects of eating are important pleasures of life, which can persist into old age. They have potent contributions to well being, which must not be forgotten. During progressive renal failure, catabolism and anorexia lead to loss of lean body mass, but concomitant fluid retention masks weight loss and may even lead to weight gain. At the initiation of HD, many patients are malnourished. However, once adequate dialysis has been attained, patients usually regain a healthy appetite, and well-nourished patients are likely to have higher pre-dialysis concentrations of blood urea nitrogen [≥80 mg/dL (30 mmol/L)] and serum creatinine.[2]

The role of nurses in imparting education about a proper diet to patients on MHD is crucial. While much progress has been made in recent years in recognizing the link between malnutrition, different diseases and increased mortality, no consensus has yet been reached concerning the ideal method of assessment and management of nutritional status in dialysis patients.

It is now widely accepted that the SF-36 questionnaire about QoL is an important tool in the assessment of patients' health care, and helps in making treatment decisions. The SF-36 is a multi-dimensional concept that includes physical functioning, social and role functioning, mental health and general health perceptions.[2] In studies of specific conditions, it has become common to measure aspects of QoL typically affected by the condition and its treatments.[3] Combining both generic and disease-specific measures allows comparisons with other populations, and should increase sensitivity to changes over time, whether in the natural history of the disease or in response to treatment. Cross-sectional studies using the SF-36 have yielded most of the data among patients on MHD. There have been very few longitudinal studies using SF-36 in patients on MHD.[4] Hence, this study was undertaken.

Materials and Methods

Seventy patients on MHD in the teaching hospitals in Urmia, Iran, were divided into two groups; both groups were requested to fill in the validated SF-36 questionnaire on QoL. The SF-36 is a widely used and validated questionnaire for assessing QoL in various population groups, including patients with end-stage renal disease (ESRD). We categorized the sociodemographic variables as follows: age <65 years (yes/no), currently married (yes/no), employed part or full time (yes/no), obtained education degree (yes/no) and residing in Urmia city (yes/no). We calculated the SF-36 domain scores ranging from 0 to 100 according to the published guidelines.[5] The SF-36, a short-form QoL scoring system consists of 36 questions that are compressed into eight multi-item scales:

(a) Physical functioning is a ten-question scale that captures abilities to deal with the physical requirement of life, such as attending to personal needs, walking and flexibility;

(b) Role-physical is a four-item scale that evaluates the extent to which physical capabilities limit activity;

(c) Bodily pain is a two-item scale that evaluates the perceived amount of pain experienced during the previous four weeks and the extent to which that pain interfered with normal work activities;

(d) General health is a five-item scale that evaluates general health in terms of personal perception;

(e) Vitality is a four-item scale that evaluates feelings of energy and fatigue;
(f) Social functioning (SF) is a two-item scale that evaluates the extent and amount of time, if any, that physical health or emotional problems interfered in interactions with family, friends and other social interactions during the previous four weeks;
(g) Role-emotional (RE) is a three-item scale that evaluates the extent, if any, to which emotional factors interfere with work or other activities;
(h) Mental health is a five-item scale that evaluates feelings, principally of anxiety and depression. Approximately two-thirds of eligible patients were enrolled; these patients were similar to non-enrolled patients with regard to gender and age.

All participants completed the dialysis-specific SF-36 questionnaire (described above).

The differences in changes in domain SF-36 according to dialysis method were analyzed using bivariate χ^2 tests and multivariate logistic regression, which compared patients whose domain score improved with patients whose score remained unchanged or worsened, adjusting for baseline domain score, age, gender and education, which was included in the outcome definition analyses.

Results

During the follow-up period, none of the study patients died. A total of 35 questionnaires were distributed to case–control patients and 35 questionnaires were distributed to study patients. The two groups were similar in age, educational level, gender and duration on dialysis treatment; 46.8% of patients were female and 52% were male. Their mean age was 45.2 ± 12.3 years. The duration on HD was 24.0 ± 16.0 months, 93.4% of them were married and 60% were illiterate. At baseline, the SF-36 domain and summary scores were substantially lower in the study patients than in the general population.[6] The total SF-36 score was slightly higher in males compared with females, but this difference was not statistically significant (P = 0.05). Thirty-five patients were educated about diet for HD while the other 35 were not counseled. There were differences between the two groups in terms of physical health and mental health dimensions. Results of the dimensions were better in the diet-counseled group. The difference in physical health, in work activities and the QoL as a whole between the groups was statistically significant (t = 2.04, df = 34, P = 0.049; t = 2.04, df = 34, P = 0.049; t = 2.28, df = 1.96, P = 0.43, respectively). The QoL of patients on HD was found to be significantly impaired ($P < 0.05$) in comparison with the QoL of healthy individuals selected from the general population, particularly with respect to the physical, psychological and social relationship domains, but not in the environmental domain. It was interesting to note that transplanted patients reported significantly better QoL scores than did the healthy individuals in all domains ($P < 0.05$), except physical health ($P = 0.583$). In patients on HD, the highest QoL score was observed in the environment domain (53.5 ± 10.3), followed by social relationships (51.9 ± 6.9), psychological health (41.9 ± 8.6) and physical domain QoL scores (38.8 ± 8.3).

Discussion

Monitoring a patient's functional status and the subjective state of well being, together known as QoL measurements, is of particular importance in patients with ESRD, because the physical debility experienced by patients with uremia can be insidious and has potentially grave consequences. Several studies have reported that for physical functioning, the SF and RE scales of the SF-36 are similar or even slightly higher in patients undergoing dialysis compared with the non-dialytic population. Several recent studies have shown that the subjective measure of QoL via self-administered questionnaires is a predictor of hospitalization and mortality in dialysis patients.[7] The task is even more essential when it pertains to patients with ESRD, whose life prolongation via renal replacement therapy has left them with a different and less-well-known lifestyle. Exploring the potentials of

self-administered QoL questionnaires in patients with ESRD has been underscored by the contemporary emphasis on dialysis outcome research.[8] The patients' subjectively perceived QoL status may not only be clinically and psychosocially meaningful *per se*, but a predictor of more objective outcomes such as prospective hospitalization and mortality. If the SF-36, which takes a few minutes of a patient's time to complete, is a strong indicator of patient outcome and is indeed a predictor of morbidity and mortality in MHD, serial annual assessments of the QoL using this simple tool might help to identify high-risk patients who may need intensified attention and risk modification interventions.

Because of the increased use of the SF-36, it has become possible to compare mean scale scores among groups of patients undergoing dialysis and between different populations of individuals. The QoL was considerably diminished in HD patients, but less so in the group that was counseled about their nutrition. Improvement in QoL can be achieved in patients if their discomfort is more effectively treated medically. One of the methods used for this is education about their nutrition program, which can be used for other chronic diseases too. More research is needed to assess whether interventions to improve QoL can lower heath risks among HD patients. This study provides a comprehensive and detailed description of the QoL of patients who started HD as well as their progress one year later. The findings have important implications for physicians who evaluate and treat patients with chronic kidney disease.

We also followed patients longitudinally and, with a thorough accounting of the disposition of patients, guarded against survival biases that might be introduced by patients who left the cohort during the course of the study. We performed an overall analysis that combined the major important outcomes, including SF-36, transplantation and survival. Information on many of the dialysis-specific domains has not been collected systematically in previous evaluations of dialysis treatment modalities. The results highlight the importance of measuring dialysis-specific domains. The results are also supported by the hypotheses that reflect clinical intuition and experience. Patients on HD would be expected to have more problems with pain (e.g., needle pricks) and dialysis access.[9] Measuring each of these domains separately allowed us to identify specific aspects of life that differed by modality, information that might be useful to individual patients with specific preferences as they attempt to decide between modalities.

Our findings expand the results of previous studies, most of which were cross-sectional and, collectively, were not conclusive regarding the impact of method of dialysis on QoL. Several studies suggest advantages for HD.[10] However, in their study, mental health scores did not change significantly over time.

Our study had some limitations. We did not measure QoL before patients began dialysis. Therefore, it is likely that we did not capture all of the improvements in SF-36 experienced by patients at the very start of dialysis. These are likely to be concentrated in domains of the general QoL as assessed by SF-36. If this initial improvement differed between dialysis modalities, then it is possible that we might fail to capture some of the subsequent changes. In the future, attempts should be made to follow QoL in chronic kidney disease patients as kidney function declines, with particular attention to changes as they make the transition from the pre-dialysis state to dialysis treatment.

Finally, as this was an observational study rather than a randomized controlled trial, we cannot be absolutely certain that differences in changes in QoL can be attributed to the dialysis method. However, it is doubtful whether a randomized controlled trial would be possible, because it may not always be possible to carry out blind assignment to treatment groups. In addition, assignment to a specific dialysis method might in itself decrease the patient's QoL, threatening the internal validity of such a design.[11]

It is imperative to examine all aspects of possible associations between health survey questionnaires such as the SF-36 and clinically relevant indices such as nutritional state, inflammation and anemia and to explore the

potentials of such scoring tools in predicting relevant clinical outcomes. The tool has to be a well-established and adequately validated one, both inclusive and user-friendly, with optimal capability of serving as an interviewer-independent, self-administered questionnaire, given the increasing time constraint involving health-care personnel in charge of patients with ESRD. The SF-36 may be a means to that end. Compared with those QoL tools that are tailored for patients undergoing dialysis, the SF-36 has the advantage of being non-specific; hence, enabling the investigators to conveniently compare the health state between patients with ESRD and non-ESRD populations under diverse observational and interventional studies. A research showed that a depressed mental state among patients on MHD is associated with increased mortality.[12,13]

Our study has important implications for practice. The good news for patients is that health and general well-being should improve during the first year of dialysis. This information should be reassuring to patients who are reluctant to start dialysis. Conversely, there may be losses in some specific aspects of life. In fact, HD may result in more positive changes in the general and physical aspects of SF-36. Physicians should be as explicit as possible in describing specific trade-offs and attempt to elicit individual preferences for these aspects of QoL. More studies are required to verify the value of the SF-36 measurements in predicting the clinical condition of patients with ESRD and their outcomes.

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