Emotional distress and health-related quality of life in patients on hemodialysis: the clinical value of COOP-WONCA charts

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ABSTRACT

Background: A significant percentage of patients on hemodialysis (HD) present with affective disorders such as anxiety and/or depression. The purpose of this study was to explore adaptive mixed affective disorders of patients on HD and to analyze the clinical value of a brief health-related quality-of-life (HRQoL) instrument, the COOP-WONCA charts, in our population of HD patient.

Methods: Seventy-five patients (mean age 49.2 years; range 20.1-64.9), who had been on HD for a mean 110 months (range 6.1-364.5 months) were studied. The Beck Depression Inventory (BDI), Hamilton Scale of Depression (HDRS) and Hamilton Scale of Anxiety (HARS) were used. To evaluate patient HRQoL, we used the validated Spanish version of the COOP-WONCA charts.

Results: Of the 75 patients studied, 44.0% (BDI) and 53.4% (HDRS) had some depressive symptoms which were moderate-severe in 14.7% (BDI) and in 22.7% (HDRS). Anxiety symptoms were observed in 46.6% of the patients (13.3% were of moderate-severe degree). There was a high level of association between both depression scales (BDI and HDRS) (r=0.70; p<0.001), as well as between both scales and the HARS (HDRS, r=0.82; p<0.001; BDI, r=0.53; p<0.001). The most affected dimensions of the COOP-WONCA charts were “Physical fitness” and “Overall health,” whereas the least affected were “Social activities” and “Daily activities.” The global score of the COOP-WONCA charts was associated with the presence of depressive (BDI, r=0.64, and HDRS, r=0.75; p<0.001) and anxiety symptoms (HARS, r=0.52; p<0.001). A score of ≥3 corresponding to the dimension “Feelings” on the COOP-WONCA charts allowed the detection of 81.8% of the patients with clinically significant depressive symptoms (BDI >18), with a sensitivity of 96.8% and a specificity of 75% for this cutoff point.

Conclusions: A high percentage of patients on HD present with mixed emotional disorders (anxiety and/or depression); a good correlation is observed between HRQoL and the levels of anxiety and depression in these patients; and measuring HRQoL with the COOP-WONCA charts may help diagnose such problems.

Key words: Anxiety, Depression, Hemodialysis, Health-related quality of life, COOP-WONCA charts

INTRODUCTION

A large proportion of patients on hemodialysis (HD) suffer mixed adaptive emotional disorders (anxiety and depression), with prevalences that vary among studies according to the patient selection process and questionnaires and diagnostic criteria used (1-3). On the other hand, different studies have reported increased morbidity-mortality among patients on dialysis who present with clinically significant levels of depression (4).

Despite their frequency and importance, such disorders often go unnoticed by the health care professionals attending these patients, since not all subjects clearly manifest the symptoms. The presence of anxiety and/or depression is not indicative of mental pathology in itself, though it may pose an important problem when the intensity and duration of the symptoms are disproportionate to the triggering stimulus. On the other hand, these affective disorders may exert a negative influence upon patient self-perceived health. In fact, the emotional/affective sphere is one of the domains included in all instruments used to assess health-related quality of life (HRQoL) (5).

The present study was conducted to explore adaptive mixed affective disorders of patients on HD and to analyze the clinical value of a brief HRQoL instrument, the COOP-WONCA charts, in our population of HD patients.

SUBJECTS AND METHODS

Patients

A cross-sectional (data collected between March and May 2003) and descriptive study was made of 75 patients on HD in our center (50 men and 25 women) with a mean age of 49.2 years (range 20.1-64.9) and a mean duration on HD of
110 months (range 6.1-364.5). All patients were informed of the nature and purpose of the study, and consent to participate was obtained in all cases. All patients were dialyzed using polysulfone membranes with different ultrafiltration coefficients and were receiving treatment with recombinant human erythropoietin. The mean duration of HD sessions was 3.8 hours (range 3-5 hours), with a mean Kt/V (second-generation Daugirdas) of 1.54 ± 0.22 and a mean hemoglobin value of 12.03 ± 1.07 g/dL.

**Inclusion and exclusion criteria**

The study sample, selected during the period between December 2002 and January 2003, included all those patients enrolled for more than 6 months in the HD program in our units. Out of a total of 171 patients, we excluded the following: (i) patients over age 65 years, since the anxiety and depression scales used were not designed for this elderly age group; (ii) patients unable to answer the questionnaires (deafness, reading problems); (iii) patients previously diagnosed with psychotic or neurological disorders or mental retardation; and (iv) patients who had suffered decompensation of their physical condition requiring hospital admission, or some stressful life event (death of a relative/friend, personal illness, personal accident or accident affecting someone close to them, changes in economic situation, change of work or home, divorce / separation, marriage, loss of work) in the 30 days prior to the study.

**Scales and instruments used**

The validated Spanish versions of 3 instruments for the evaluation of depression and anxiety symptoms were used (the objective being to quantify symptoms, not yield a diagnosis): the Beck Depression Inventory (BDI), Hamilton Scale of Depression (HDRS) and Hamilton Scale of Anxiety (HARS). HRQoL was assessed with the validated Spanish version of the COOP-WONCA charts.

**Beck Depression Inventory**

The BDI is a self-administered questionnaire comprising 21 items that evaluates a broad spectrum of depressive symptoms (6). Of these 21 items, 15 refer to psychological-cognitive symptoms, while the remaining 6 items address somatic-vegetative symptoms. Thus, the instrument places greater emphasis on the cognitive component of depression. For each item, the patient is required to select the answer that best reflects his or her present situation and situation in the last week. The total score is obtained by adding the values of the selected phrases, which range from 0 to 3. The score range is from 0 to 63 points. The cutoff points usually accepted for scoring the intensity/severity of depression are the following:

- No depression: 0-9 points
- Mild depression: 10-18 points
- Moderate depression: 19-29 points
- Severe depression: ≥30 points

To the effects of case screening or detection, a cutoff point of ≥13 points has been established in application to the general population. Since the HD population comprises patients with associated pathology, the somatic items would tend to increase the number of false-positive results when using a low cutoff point. As a result, a higher cutoff point has been used, in a way similar to the procedure applied to patients with chronic pain (i.e., 19 points) (7).

**Hamilton Depression Scale**

The HDRS consists of 17 items that evaluate the symptoms profile and severity of depression (8). The time reference is the moment of the interview, except for some items such as sleep, which are explored for the period corresponding to the previous 2 days. The HDRS is administered by a clinician. Each item is scored from 0 to 2 in some cases and from 0 to 4 in others, selecting the score best adapted to the patient’s symptomatology. The total score is the sum of the scores assigned to each of the items. The score range is 0-52 points. We have used the following intervals to classify the intensity/severity of the depressive disorder:

- No depression: 0-6 points
- Mild depression: 7-17 points
- Moderate depression: 18-24 points
- Severe depression: 25-52 points

**Hamilton Anxiety Scale**

The HARS consists of 14 items that evaluate the physical, psychological and behavioral aspects of anxiety (9). The time reference in this case comprises the last few days in the application of all items except the last, which assesses patient behavior during the actual interview. The HARS is administered by a clinician. The score range is 0-56 points. The recommended cutoff points are

- No anxiety: 0-5 points
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**Mild anxiety:** 6-14 points
**Moderate-severe anxiety:** >15 points

**COOP-WONCA charts**

This is a generic questionnaire for the evaluation of HRQoL, comprising 9 dimensions with a single item each, in its full version (10, 11). Each dimension has a title and asks a question relating to what has happened in the last 2 weeks. The patient selects 1 of 5 possible answers that are accompanied by a drawing or sign. The possible answers are scored from 1 to 5, and increasing scores correspond to worse HRQoL. The chart titles are W1 = Physical fitness, W2 = Feelings, W3 = Daily activities, W4 = Social activities, W5 = Changes in health, W6 = Health condition, W7 = Pain, W8 = Social support and W9 = Quality of life. A global score is obtained corresponding to the sum of all the drawings except chart 5 (Changes in health), which has a bipolar structure and is therefore rated in a different way from the rest.

**Data collection**

A case report form was designed for each patient, including the variables described above and the results of the questionnaires completed by the patients. To ensure data collection uniformity, consensus was reached among the interviewers regarding the way to request patient cooperation and conduct the interviews. In this context, the interviewers limited their intervention to explaining the instructions in a standardized manner and, where applicable, to reading the questions. The Hamilton scales and COOP-WONCA charts were completed by an interviewer, during a dialysis session. The BDI was in turn self-administered after the same dialysis session.

**Statistical analysis**

The SPSS version 11.5 statistical package was used for data analysis. The results are expressed as percentages, means ± standard deviation, and ranges. The association between quantitative variables was evaluated by means of the Pearson linear correlation coefficient (or Spearman coefficient in the event of ordinal variables or parameters without a normal distribution). The chi-square test was in turn used for examining associations between qualitative variables. Analysis of variance (ANOVA) was used for the comparison of means. Statistical significance was considered to be p<0.05.

**RESULTS**

The sociodemographic characteristics of the study population are shown in Table I. Between 44% (33/75) (BDI) and 53.4% (40/75) (HDRS) of the patients studied presented with some depressive symptom – which was of moderate to severe intensity in 14.7% (BDI) and 22.7% (HDRS) of the cases. In turn, 46.6% (35/75) presented with anxiety symptoms (of moderate to severe intensity in 13.3%). An important correlation was observed between the 2 depression scales (BDI and HDRS; r=0.70; p<0.001), as well as between the 2 scales and the HARS (HDRS, r=0.82; p<0.001; BDI, r=0.53, p<0.001).

Table II shows the means and standard deviations of the scores corresponding to each of the COOP-WONCA charts, as well as the number of answers corresponding to each of the possible scores of each chart. The 2 most affected dimensions were “Physical fitness” and “Overall health,” while the least affected dimensions were “Social activities” and “Daily activities.” The global score of the COOP-WONCA charts showed a

**TABLE I**

**SOCIODEMOGRAPHIC CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>75</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>75</td>
</tr>
<tr>
<td>Mean time on hemodialysis, months</td>
<td>110.0 ± 101.4</td>
</tr>
<tr>
<td>Mean age, years</td>
<td>49.2 ± 12.0</td>
</tr>
<tr>
<td>18-35 years</td>
<td>11 (14.7%)</td>
</tr>
<tr>
<td>36-50 years</td>
<td>25 (33.3%)</td>
</tr>
<tr>
<td>51-65 years</td>
<td>39 (52.0%)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>25 (33.3%)</td>
</tr>
<tr>
<td>Male</td>
<td>50 (66.6%)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>53 (70.6%)</td>
</tr>
<tr>
<td>Single, widowed, divorced</td>
<td>22 (29.4%)</td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
</tr>
<tr>
<td>Illiterate-primary</td>
<td>59 (78.6%)</td>
</tr>
<tr>
<td>Secondary-higher</td>
<td>16 (21.4%)</td>
</tr>
<tr>
<td>Occupational status</td>
<td></td>
</tr>
<tr>
<td>Active</td>
<td>21 (28.0%)</td>
</tr>
<tr>
<td>Retired</td>
<td>54 (72.0%)</td>
</tr>
<tr>
<td>Social isolation</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10 (13.3%)</td>
</tr>
<tr>
<td>No</td>
<td>65 (86.7%)</td>
</tr>
</tbody>
</table>

Data are means ± SD, or percentages (in parentheses).
correlation to the scores of the depression questionnaires (BDI, r=0.64; HDRS, 0.75; p<0.001) and anxiety (HARS, r=0.52; p<0.001). The patients with moderate to severe depression and anxiety showed poorer HRQoL (significantly higher scores) in relation to most of the dimensions of the COOP-WONCA charts. No significant differences attributable to the levels of anxiety and depression were found in 2 of the dimensions: “Change in health” and “Social support” (Figs. 1-3). A score of ≥3 in the dimension “Feelings” of the COOP-WONCA charts (11 patients) showed a positive predictive value (PPV) of 81.8%, a negative predictive value (NPV) of 95.3%, a specificity of 96.8% and a sensitivity of 75% for the existence of clinically significant depressive symptomatology in the BDI (>18 points).

**DISCUSSION**

Hemodialysis involves an important change in the life of patients, affecting their social, occupational, physical and personal circumstances. Although such changes affect all

<table>
<thead>
<tr>
<th>COOP / WONCA charts</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1 Physical fitness</td>
<td>3</td>
<td>7</td>
<td>34</td>
<td>27</td>
<td>4</td>
<td>3.2 ± 0.8</td>
</tr>
<tr>
<td>W2 Feelings</td>
<td>30</td>
<td>23</td>
<td>11</td>
<td>7</td>
<td>4</td>
<td>2.0 ± 1.2</td>
</tr>
<tr>
<td>W3 Daily activities</td>
<td>34</td>
<td>24</td>
<td>6</td>
<td>8</td>
<td>3</td>
<td>1.9 ± 1.3</td>
</tr>
<tr>
<td>W4 Social activities</td>
<td>50</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td>3</td>
<td>1.7 ± 1.3</td>
</tr>
<tr>
<td>W5 Changes in health</td>
<td>3</td>
<td>15</td>
<td>54</td>
<td>3</td>
<td>0</td>
<td>2.7 ± 0.7</td>
</tr>
<tr>
<td>W6 Overall health</td>
<td>2</td>
<td>11</td>
<td>33</td>
<td>25</td>
<td>4</td>
<td>3.2 ± 0.8</td>
</tr>
<tr>
<td>W7 Pain</td>
<td>27</td>
<td>18</td>
<td>12</td>
<td>13</td>
<td>5</td>
<td>2.3 ± 1.4</td>
</tr>
<tr>
<td>W8 Social support</td>
<td>23</td>
<td>24</td>
<td>14</td>
<td>9</td>
<td>5</td>
<td>2.3 ± 1.1</td>
</tr>
<tr>
<td>W9 General life</td>
<td>8</td>
<td>38</td>
<td>24</td>
<td>4</td>
<td>1</td>
<td>2.3 ± 0.8</td>
</tr>
</tbody>
</table>
patients, and anxiety and depression may be normal responses to these situations, not all patients suffer from them with the same intensity, and a large percentage of individuals on HD present adaptive mixed emotional disorders that often go unnoticed (12). In this study, approximately one half of the patients suffered some anxiety and/or depression symptom, and 13% and 22%, respectively, showed symptomatology of moderate to severe intensity. Similar results have been reported by other studies (12, 13). Although the scales used in this study (BDI, HDRS and HARS) were designed to establish anxiety and depression symptom degrees, and not to establish a diagnosis of these disorders (14), they do help identify patients with problems of some kind, and allow action with regard to them. In this context, other more precise questionnaires are nonviable in actual clinical practice, due to their infeasibility (time and cost of administration). Both scales are limited by – in patients with concomitant physical illness – the important influence of somatic symptoms upon the final score (15), though this is partly compensated for by using a higher cutoff point, in a way similar to the situation found in chronic pain patients (7).

The 2 HRQoL dimensions most affected in our patient population were “Physical fitness” and “Overall health,” while the least affected dimensions were “Social activities” and “Daily activities.” Similar results have been found in other studies using other questionnaires, such as the Kidney Disease Quality of Life, Short Form (KDQOL-SF), in which lower scores (increased involvement) likewise corresponded to physical function, vitality and general health (16, 17).

In our experience, the COOP-WONCA charts (18) afford results similar to those of other questionnaires such as the NHP (Nottingham Health Profile), SIP (Sickness Impact Profile) or SF-36, widely used among patients receiving dialysis (1, 2, 5, 19), and are moreover briefer and simpler to answer. In principle, this would favor the routine and repeated use of the charts over time in dialysis units. It has been reported that these charts are valid for assessing HRQoL among dialysis patients, since on comparison with the SF-36 questionnaire (widely used in this patient population) they showed a convergent validity of 0.57, a discriminant validity of 0.22 and a reliability, as determined with Cronbach’s $\alpha$, of 0.76 – though other psychometric properties would remain to be determined, such as sensitivity to change in patients of this kind (20).

On the other hand, a good correlation was observed between patient HRQoL and the levels of anxiety and depression: the global score of the COOP-WONCA charts correlated to the scores of the depression (BDI and HDRS) and anxiety (HARS) questionnaires. In turn, patients with moderate to severe symptoms of depression and/or anxiety presented the highest scores (poorest HRQoL) in most of the COOP-WONCA charts. Only dimensions W5 (“Changes in health”) and W8 (“Social support”) showed no significant differences in relation to the different degrees of anxiety and depression. Other studies have obtained similar results, an association being noted between HRQoL and anxiety and depression states when using different questionnaires such as the NHP (1) and the KDQOL-SF (21). The above-mentioned correlations and the capacity to predict depression with dimension W2 (“Feelings”) of the COOP-WONCA charts seem to justify their use in the detection of such disorders – in the same way as the dimension “Emotional reactions” of the NHP (1), or “Mental health” of the SF-36 (22).

The main limitation of our study was that no elderly patients (>65 years) were included (these being the most common patients in dialysis units), due to the fact that the anxiety and depression scales used were not designed for this age group. In any case, the existence of anxiety or depression symptoms does not appear to be related to age among patients on dialysis (1, 5). Another limitation is that the number of patients is not large enough for this type of scale, so further work with a larger sample is needed to confirm these results. The fact that we excluded patients requiring hospital admission, or who had suffered some stressful life situation in the 30 days prior to

![Fig. 3 - COOP-WONCA chart scores recorded according to the degree of depression (Beck Depression Inventory). W1 = Physical fitness, W2 = Feelings, W3 = Daily activities, W4 = Social activities, W5 = Changes in health, W6 = Overall health, W7 = Pain, W8 = Social support, W9 = General life; +p<0.05; *p<0.01; **p<0.001.](image-url)
the study, in principle removes the possibility of the existence of other factors which could trigger anxiety and/or depression. Therefore, the results obtained are attributable to the daily life situations of the patients on dialysis. To summarize, the following can be concluded: (i) a high percentage of patients on HD present with mixed emotional disorders (anxiety and/or depression); (ii) the existence of these disorders is associated with worsened perceived health; and (iii) the COOP-WONCA charts are a simple instrument for assessing HRQoL among HD patients, and moreover may serve for the initial detection of patients with moderate to severe degrees of depression.

The important repercussions of emotional disorders upon patient well-being, and their possible influence upon morbidity-mortality, make their diagnosis and management essential. The use of HRQoL questionnaires may help identify those patients with adaptive emotional disorders that often go unnoticed. The identification of these disorders would allow the adoption of measures (appropriate use of anxiolytic agents / antidepressants and psychological counseling) to help the patients adapt to their situation – thereby contributing to improvements in their health and possibly also survival.

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