Introduction and objectives. This study provides an estimate of the prevalence of depression, and identifies associated medical and psychosocial factors, in elderly hospitalized patients with heart failure (HF) in Spain.

Methods. The study included 433 patients aged 65 years or more who underwent emergency admission at four Spanish hospitals between January 2000 and June 2001 and who had a primary or secondary diagnosis of HF. Depression was defined as the presence of three or more symptoms on the 10-item Geriatric Depression Scale.

Results. In total, 210 (48.5%) study participants presented with depression: 71 men (37.6%) and 139 women (57.0%). Depression was more common in patients with the following characteristics: NYHA functional class III-IV (adjusted odds ratio or aOR=2.00, 95% confidence interval or 95% CI, 1.23-3.24), poor score on the physical domain of the quality-of-life assessment (aOR=3.14; 95% CI, 1.98-4.99), being dependent for one or two basic activities of daily living (BADLs) (aOR=2.52; 95% CI, 1.41-4.51), being dependent for ≥3 BADLs (aOR=2.47; 95% CI, 1.20-5.07), being limited in at least one instrumental activity of daily living (aOR=2.20; 95% CI, 1.28-3.79), previous hospitalization for HF (aOR=1.71; 95% CI, 1.99-5.45), spending more than 2 hours/day alone at home (aOR=3.24; 95% CI, 1.93-5.45), and being dissatisfied with their primary care physician (aOR=1.90; 95% CI, 1.14-3.17).

Conclusions. Depression is very common in elderly hospitalized patients with HF and is associated with several medical and psychosocial factors. The high prevalence of depression, the poorer prognosis for HF in patients with depressive symptoms, and the existence of simple diagnostic tools and effective treatment argue in favor of systematic screening for depression in these patients.

Key words: Heart failure. Depression. Older adults. Spain.

Prevalencia de depresión, y factores biomédicos y psicosociales asociados, en ancianos hospitalizados con insuficiencia cardíaca en España

Introducción y objetivos. En este trabajo se estima la prevalencia de depresión y se identifican los factores biomédicos y psicosociales asociados en ancianos hospitalizados con insuficiencia cardíaca en España.

Métodos. Se estudió a 433 pacientes ≥ 65 años ingresados de urgencia en 4 hospitales españoles desde enero de 2000 hasta junio de 2001, con diagnóstico principal o secundario de insuficiencia cardíaca. Se consideró que había depresión ante la presencia de 3 síntomas en la Escala de Depresión Geriátrica de 10 ítems.

Resultados. Del total de pacientes estudiados, 210 (48.5%) presentaron depresión. Las cifras correspondientes fueron 71 (37.6%) en varones y 139 (57.0%) en mujeres. La depresión fue más frecuente en los pacientes con las siguientes características: grado funcional III-IV de la NYHA (odds ratio ajustada [ORa] = 2.00; intervalo de confianza [IC] del 95%, 1.23-3.24) y sentirse insatisfechos con su médico primario (ORa=1.90; IC del 95%, 1.14-3.17).

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See editorial on pages 761-5
INTRODUCTION

The prognosis of heart failure continues to be poor despite the latest therapeutic advances, and worsens when depressive symptoms occur. In addition, the costs of health care for heart failure in depressed patients are 25%–40% higher than in those patients without depression, even after adjusting for other comorbidity. This higher cost is not the result of more use of mental health services but comorbidity. This higher cost is not the result of more use of mental health services but comorbidity. The prevalence of depression in hospitalized patients ranges from 11% to 77% depending on the diagnostic instrument used, the severity of the depressive symptoms, age, physical health and the patient’s functional state. There also is evidence that the frequency of depression in patients with cardiovascular disorders varies between regions and ethnic groups. On the other hand, there is little information on the variables associated with the frequency of depressive symptoms in patients with heart failure, especially regarding psychosocial variables. Since these associations depend on the patients’ expectations regarding their health and other social constructs, their magnitude also can vary between countries and cultures.

METHODS

The main features of this research have been described elsewhere. The study included 433 patients undergoing emergency admission to four Spanish hospitals from January 2000 to June 2001. Patients of both sexes were included, ≥65 years, diagnosed with heart failure (primary or secondary) during hospitalization according to the European Society of Cardiology criteria. Patient selection and data collection were done after obtaining informed written consent from the patient and an accompanying family member.

Study Variables and Data Collection

During hospitalization, and after stabilizing the patient, information was obtained by medical staff via personal interview complemented by review of the medical record. The depressive symptoms were assessed via the Geriatric Depression Scale. The short 10-item version was used to assess the patient’s state of mind during the 7 days prior to the interview. A patient was considered depressed when he/she presented ≥3 symptoms in this scale. Furthermore, information on three groups of variables was collected:

1. Sociodemographic variables: sex, age, level of education, and perception of income level regarding personal needs or those of the household.
2. Biomedical variables: etiology of heart failure (ischemic heart disease, hypertensive heart disease, valvular heart disease, other), functional status according to the New York Heart Association (NYHA) classification, left ventricle ejection fraction (LVEF) via 2D-echocardiography and comorbidity via the Charlson index. Information was also obtained on the physical aspects of the health-related quality of life via physical summary of the Minnesota Living With Heart Failure questionnaire. To analyze this quality of life dimension, the median (27 points) was used as a cut-off point in the group sample. In addition, the ability to carry out the basic activities of daily life (BADL) was assessed with the Katz index, and the ability to carry out instrumental activities with the Lawton and Brody index. Given that physical functional

ABBR EVI AT I ONS

BADL: basic activities of daily life.
LVEF: left ventricle ejection fraction.

95%, 1.98-4.98); dependencia en 1 o 2 actividades básicas de la vida diaria (ABVD) (ORa = 2.52; IC del 95%, 1.41-4.51); dependencia en 3 o más ABVD (ORa = 2.47; IC del 95%, 1.20-5.07); limitación en alguna actividad instrumental de la vida diaria (ORa = 2.20; IC del 95%, 1.28-3.79); hospitalización previa por insuficiencia cardíaca (ORa = 1.71; IC del 95%, 1.99-5.45); estaban solos en casa más de 2 h al día (ORa = 3.24; IC del 95%, 1.93-5.45); menor satisfacción con el médico de atención primaria (ORa = 1.90; IC del 95%, 1.14-3.17).

Conclusiones. La depresión es muy frecuente en los ancianos hospitalizados con insuficiencia cardíaca, y se asocia con varios factores biomédicos y psicosociales. Esta elevada frecuencia, el peor pronóstico de la insuficiencia cardíaca en presencia de síntomas depresivos y el tratamiento eficaz apoyan el cribado sistemático de la depresión en estos pacientes.

RESULTS

Patient Characteristics

The clinical and psychosocial characteristics of the 433 patients studied have been previously described, and thus are presented here in a shortened only briefly presented. There were 189 males (43.6%). The mean age was 77.4±6.8 years; mean LVEF was 46±20%; 35% of the patients had NYHA functional class III-IV, and presented an average of 1.7 associated diseases. Among the causes of heart failure, ischemic heart disease was identified in 35% of patients, hypertensive heart disease in 53%, valvular heart disease in 25%, and other causes in 28%. Approximately patients presented more than 1 etiological factor. Some 45% had been hospitalized due to heart failure in the previous year. Finally, half the patients had a good or adequate social network and more than 85% received social, emotional, or instrumental support. Finally, the median score was 10 points in the emotional-mental summary of the quality of life assessed with the Minnesota Living With Heart Failure questionnaire.

Prevalence of Depression

Of the 433 patients studied, 210 (48.5%) presented depression. A total of 71 males were identified (37.6%) with depression, and 139 females (57.0%).

Table 1 shows the prevalence of depression according to sociodemographic and biomedical variables. Depression was more frequent (P<0.05) in the individuals with NYHA functional class III-IV, in those with a worse physical summary of the quality of life, greater limitations in the BADL, instrumental activities of daily life and Red Cross scale, and in those who had undergone previous hospitalization due to heart failure. Finally, the number of associated diseases was greater in patients with depression. This same pattern was observed in each sex, although in some cases the difference did not reach statistical significance.

Table 2 presents the prevalence of depression according to psychosocial variables. Depression was more frequent (P<0.05) among widows/widowers, those who spent more time alone, those lacking a confidante and those less satisfied with their primary care physician. The same pattern was observed in each sex, although the differences did not barely reached statistical significance very often.

Biomedical and Psychosocial Variables Associated With Depression

The results of the multivariate analysis (Table 3) are, in most cases, consistent with those of the univariate analysis described previously. In the patient group
studied, depression was less frequent in single, separated or divorced people than in married ones (OR=0.24; 95% CI, 0.09-0.65). The following were independently associated with a higher level of depression: NYHA functional class III-IV, poor score on the physical domain of the quality-of-life assessment, dependency regarding one or two BADL, and for 3 or more BADL, dependency regarding instrumental activities in daily life, previous hospitalization for heart failure in the foregoing year, being alone in the house for more than 2 h daily, and less satisfaction with the primary care physician. Associations similar to the previous ones were found in each sex independently, along with certain peculiarities. First, the frequency of depression was lower among females who never visited a senior

Guallar-Castillón P et al. Depression in Elderly Hospitalized Patients With Heart Failure

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TABLE 1. Prevalence of Depression in Elderly Hospitalized Patients With Heart Failure, According to Sociodemographic and Biomedical Variables, in the Total Sample and by Sex*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age, y</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65-74</td>
<td>66 (42.6)</td>
<td>30 (39.1)</td>
<td>36 (50.0)</td>
</tr>
<tr>
<td>75-84</td>
<td>106 (51.5)</td>
<td>32 (38.1)</td>
<td>74 (60.7)</td>
</tr>
<tr>
<td>≥85</td>
<td>38 (52.8)</td>
<td>9 (40.9)</td>
<td>29 (58.0)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than primary</td>
<td>72 (47.4)</td>
<td>14 (28.0)</td>
<td>58 (56.9)</td>
</tr>
<tr>
<td>Primary or higher</td>
<td>138 (49.1)</td>
<td>57 (41.0)</td>
<td>81 (57.0)</td>
</tr>
<tr>
<td><strong>Income according to need</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comfortable/sufficient</td>
<td>51 (47.2)</td>
<td>16 (32.7)</td>
<td>35 (59.3)</td>
</tr>
<tr>
<td>Just adequate/limited/very limited</td>
<td>159 (48.9)</td>
<td>55 (39.3)</td>
<td>104 (56.2)</td>
</tr>
<tr>
<td><strong>Etiology</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ischemic heart disease</td>
<td>75 (48.7)</td>
<td>34 (41.5)</td>
<td>41 (56.9)</td>
</tr>
<tr>
<td>Hypertensive heart disease</td>
<td>112 (48.1)</td>
<td>33 (35.9)</td>
<td>79 (56.0)</td>
</tr>
<tr>
<td>Valvular heart disease</td>
<td>55 (53.9)</td>
<td>17 (46.6)</td>
<td>38 (60.3)</td>
</tr>
<tr>
<td>Other</td>
<td>75 (49.7)</td>
<td>26 (36.1)</td>
<td>49 (62.0)</td>
</tr>
<tr>
<td><strong>Functional class (NYHA)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-II</td>
<td>114 (40.7)</td>
<td>43 (33.9)</td>
<td>71 (46.4)</td>
</tr>
<tr>
<td>III-IV</td>
<td>96 (62.7)</td>
<td>28 (45.2)</td>
<td>68 (74.7)</td>
</tr>
<tr>
<td><strong>Left ventricle ejection fraction</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;45%</td>
<td>80 (47.1)</td>
<td>37 (35.9)</td>
<td>43 (64.2)</td>
</tr>
<tr>
<td>≥45%</td>
<td>130 (49.4)</td>
<td>34 (39.5)</td>
<td>96 (54.2)</td>
</tr>
<tr>
<td><strong>Number of associated diseases, mean±SD</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depressed patients</td>
<td>2.01±0.78</td>
<td>2.51±1.85</td>
<td>1.76±0.70</td>
</tr>
<tr>
<td>Nondepressed patients</td>
<td>1.68±0.59</td>
<td>1.86±0.51</td>
<td>1.47±0.66</td>
</tr>
<tr>
<td><strong>Physical summary of the quality of life (MLWHF)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Better than the median (&lt;27 points)</td>
<td>73 (32.0)</td>
<td>29 (25.2)</td>
<td>44 (38.8)</td>
</tr>
<tr>
<td>The same as or worse than the median (&lt;27 points)</td>
<td>137 (67.3)</td>
<td>42 (56.8)</td>
<td>95 (61.2)</td>
</tr>
<tr>
<td><strong>Basic activities of daily life (BADL)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent BADL</td>
<td>94 (36.3)</td>
<td>39 (27.7)</td>
<td>55 (46.6)</td>
</tr>
<tr>
<td>Dependent for 1 or 2 BADL</td>
<td>61 (61.6)</td>
<td>19 (67.9)</td>
<td>42 (59.2)</td>
</tr>
<tr>
<td>Dependent for 3 or more BADL</td>
<td>55 (73.3)</td>
<td>13 (65.0)</td>
<td>42 (76.4)</td>
</tr>
<tr>
<td><strong>Intrumental activities of daily life</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomous</td>
<td>40 (26.7)</td>
<td>22 (22.9)</td>
<td>18 (33.3)</td>
</tr>
<tr>
<td>Dependent</td>
<td>170 (60.1)</td>
<td>49 (52.7)</td>
<td>121 (63.7)</td>
</tr>
<tr>
<td><strong>Red Cross functional scale</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum difficulty</td>
<td>106 (41.9)</td>
<td>39 (30.5)</td>
<td>67 (53.6)</td>
</tr>
<tr>
<td>Assistance with walking stick or person</td>
<td>84 (55.6)</td>
<td>24 (47.1)</td>
<td>60 (60.0)</td>
</tr>
<tr>
<td>Assistance of 2 people or bedridden</td>
<td>20 (89.0)</td>
<td>8 (80.0)</td>
<td>12 (60.2)</td>
</tr>
<tr>
<td><strong>Previous hospitalization</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>100 (62.0)</td>
<td>38 (28.6)</td>
<td>70 (52.6)</td>
</tr>
<tr>
<td>Yes</td>
<td>110 (54.0)</td>
<td>41 (48.8)</td>
<td>69 (76.2)</td>
</tr>
</tbody>
</table>

*NYHA indicates New York Heart Association; MLWHF, Minnesota Living With Heart Failure questionnaire.
† The absolute number and the percentage of patients with depression in each category of the sociodemographic and biomedical variables are presented.
‡ P<.05.
§ P<.01.
|| P<.001, via categories with 1 variable in every column.
citizens center (OR=0.29; 95% CI, 0.10-0.82). Second, it seems that the association between age and depression varies by sex, so that depression tends to decline with age in males and increase in females. Third, the females tended to present depression more frequently than males (OR=1.49; 95% CI, 0.89-2.50). Finally, the association between functional limitation and depression was not found in each sex for the same disability scale, although it seems that, overall, depression is more frequent in people with greater disability, both in males and in females.

DISCUSSION

This work shows that almost half of the elderly hospitalized patients with heart failure present depression. However, the frequency of this disorder varies substantially depending on several biomedical and psychosocial factors.

Comparison With Other Studies

As in previous studies, this work has shown that depression is very frequent in patients hospitalized for heart failure. Specifically, it is three or four times more frequent than in the general population of the same age. As in other studies in patients with heart failure, but not all, we also found a trend toward greater frequency of depression among the females. However, the finding of a smaller frequency of depression in the single, separated and divorced people than in married ones could be due to the smaller numbers among the former (Table 2), which would lead to extreme and probably unsound results.

TABLE 2. Prevalence of Depression in Elderly Hospitalized Patients With Heart Failure, According to Psychosocial Variables, in the Total Sample and by Sex

<table>
<thead>
<tr>
<th></th>
<th>Total n (%)</th>
<th>Males n (%)</th>
<th>Females n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>97 (44.8)</td>
<td>52 (36.1)</td>
<td>45 (62.5)</td>
</tr>
<tr>
<td>Single/separated/divorced</td>
<td>9 (28.1)</td>
<td>3 (23.1)</td>
<td>6 (31.6)</td>
</tr>
<tr>
<td>Widow/Widower</td>
<td>104 (56.2)</td>
<td>16 (50.0)</td>
<td>88 (57.5)</td>
</tr>
<tr>
<td>Living alone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>24 (53.3)</td>
<td>6 (60.0)</td>
<td>18 (51.4)</td>
</tr>
<tr>
<td>No</td>
<td>186 (47.9)</td>
<td>65 (36.3)</td>
<td>121 (48.6)</td>
</tr>
<tr>
<td>Contact with family members</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily or almost daily</td>
<td>108 (46.8)</td>
<td>36 (35.6)</td>
<td>72 (55.4)</td>
</tr>
<tr>
<td>≥ once a week</td>
<td>102 (50.5)</td>
<td>35 (39.8)</td>
<td>67 (68.8)</td>
</tr>
<tr>
<td>Contact with friends or neighbors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily or almost daily</td>
<td>85 (44.0)</td>
<td>33 (36.7)</td>
<td>52 (50.5)</td>
</tr>
<tr>
<td>Less than almost daily</td>
<td>125 (51.1)</td>
<td>38 (34.8)</td>
<td>87 (61.7)</td>
</tr>
<tr>
<td>Time alone at home</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 2 hours per day</td>
<td>118 (41.8)</td>
<td>46 (32.6)</td>
<td>72 (51.1)</td>
</tr>
<tr>
<td>&gt; 2 hours per day</td>
<td>92 (60.9)‡</td>
<td>25 (52.1)†</td>
<td>67 (65.0)†</td>
</tr>
<tr>
<td>Confidante</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>169 (46.4)</td>
<td>59 (36.9)</td>
<td>110 (54.5)</td>
</tr>
<tr>
<td>No</td>
<td>41 (59.4)†</td>
<td>12 (44.4)</td>
<td>29 (69.0)</td>
</tr>
<tr>
<td>Caretaker</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>183 (48.7)</td>
<td>59 (36.2)</td>
<td>124 (58.2)</td>
</tr>
<tr>
<td>No</td>
<td>27 (47.4)</td>
<td>12 (46.2)</td>
<td>15 (48.4)</td>
</tr>
<tr>
<td>Domestic appliances</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>74 (46.5)</td>
<td>29 (38.7)</td>
<td>45 (56.3)</td>
</tr>
<tr>
<td>Average</td>
<td>93 (48.4)</td>
<td>32 (36.8)</td>
<td>61 (68.1)</td>
</tr>
<tr>
<td>Low</td>
<td>43 (52.6)</td>
<td>10 (37.0)</td>
<td>33 (60.0)</td>
</tr>
<tr>
<td>Visiting a senior citizens center</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequently or occasionally</td>
<td>37 (44.0)</td>
<td>17 (30.4)</td>
<td>20 (71.4)</td>
</tr>
<tr>
<td>Never</td>
<td>173 (49.8)</td>
<td>54 (40.6)</td>
<td>119 (55.1)</td>
</tr>
<tr>
<td>Satisfaction with primary care physician</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very satisfied</td>
<td>146 (45.2)</td>
<td>47 (33.0)</td>
<td>99 (64.1)</td>
</tr>
<tr>
<td>Less than very satisfied</td>
<td>64 (58.2)†</td>
<td>24 (49.0)</td>
<td>40 (60.6)</td>
</tr>
</tbody>
</table>

*The absolute number and percentage of patients with depression in each category of the psychosocial variables.
† P<.05.
‡ P<.01.
§ P=.01, via categories with one variable in every column.
In fact, in the literature, depression tends to be less frequent in married people,\textsuperscript{11,25,26} although not always.\textsuperscript{3} Our findings are also consistent with the literature when showing that depression is more frequent in those with worse physical health,\textsuperscript{8,9,11,28} whether measured by NYHA functional class,\textsuperscript{2,4,27,29} the physical component of the quality of life,\textsuperscript{29} the degree of disability in activities of daily life\textsuperscript{3,26-28} or previous hospitalization due to heart failure in the foregoing year.\textsuperscript{3} In addition, as in other works, we did not find an association with classical indicators of the severity of heart failure such as LVEF\textsuperscript{23,5,11,28} However, the absence of an independent association with the number of comorbidities as measured by the Charlson index, was surprising. This could have been due to the comorbidity being expressed through the poor quality of life and greater disability, which, in fact, presented a statistically significant association with depression in the multivariate analysis.

In other studies a greater frequency of depression has been shown in subjects with a smaller social support network\textsuperscript{9,11,28} although ours is the only study to have found this among people who spend more than 2 h alone in their houses. In the univariate analysis,

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|c|}
\hline
 & \textbf{Total} & & & & \\
 & \textbf{OR (95\% CI)} & \textbf{Males} & \textbf{OR (95\% CI)} & \textbf{Females} & \textbf{OR (95\% CI)} \\
\hline
\textbf{Sex} & & & & & \\
Male & 1 & & & & \\
Female & 1.49 (0.89-2.50) & & & & \\
\hline
\textbf{Age, y} & & & & & \\
65-74 & 1 & 1 & 1 & & \\
75-84 & 1.15 (0.68-1.94) & 0.68 (0.31-1.48) & 1.07 (0.83-3.98) & & \\
≥85 & 0.40 (0.17-0.95) & 0.29 (0.08-0.95) & 1.49 (0.52-3.19) & & \\
\hline
\textbf{Marital status} & & & & & \\
Married & 1 & 1 & 1 & & \\
Single/separated/divorced & 0.24 (0.09-0.65) & 0.24 (0.05-1.22) & 0.16 (0.04-0.58) & & \\
Widow/widower & 0.61 (0.34-1.08) & 0.89 (0.33-2.40) & 0.53 (0.26-1.11) & & \\
\hline
\textbf{Functional class (NYHA)} & & & & & \\
I-II & 1 & & & 1 & \\
III-IV & 2.00 (1.23-3.24) & 1 & & 3.42 (1.77-6.59) & \\
\hline
\textbf{Physical summary of the quality of life} & & & & & \\
Good & 1 & 1 & 1 & & \\
Bad & 3.14 (1.98-4.99) & 3.49 (1.71-7.14) & 3.05 (1.67-5.57) & & \\
\hline
\textbf{Basic activities of daily life (BADL)} & & & & & \\
Independent BADL & 1 & 1 & & & \\
Dependent for 1 or 2 BADL & 2.52 (1.41-4.51) & 6.83 (2.31-20.23) & & & \\
Dependent for 3 or more BADL & 2.47 (1.20-5.17) & 3.56 (1.06-11.96) & & & \\
\hline
\textbf{Instrumental activities of daily life} & & & & & \\
Autonomous & 1 & 1 & 1 & & \\
Dependent & 2.20 (1.28-3.79) & 2.19 (1.02-4.67) & 3.49 (1.56-7.78) & & \\
\hline
\textbf{Previous hospitalization} & & & & & \\
No & 1 & 1 & & & \\
Yes & 1.71 (1.08-2.70) & 1 & & & \\
\hline
\textbf{Time alone at home} & & & & & \\
≤2 h daily & 1 & 1 & 1 & & \\
>2 h daily & 3.24 (1.50-8.45) & 3.55 (1.50-8.42) & 2.86 (1.50-5.45) & & \\
\hline
\textbf{Satisfaction with primary care physician} & & & & & \\
Very satisfied & 1 & 1 & & & \\
Less than very satisfied & 1.90 (1.14-3.17) & 1.91 (1.14-3.22) & & & \\
\hline
\textbf{Visiting senior citizen center} & & & & & \\
Frequently or occasionally & 1 & 1 & & & \\
Never & 0.29 (0.10-0.82) & 1 & & & \\
\hline
\end{tabular}
\caption{Odds Ratio (OR) of Prevalence of Depression and 95\% Confidence Intervals (CI) According to Sociodemographic, Biomedical, and Psychosocial Variables in Elderly Hospitalized Patients With Heart Failure, in the Total Sample and by Sex. Results of a Logistic Regression Model With Stepwise Variable Selection (Variables Used if P<.05, Except for Sex, Age, and Marital Status)*}
\end{table}

*NA indicates non-applicable; NYHA, New York Heart Association.

1 P<.05.
2 P<.01.
3 P<.001.
depression also showed a tendency to be associated with other indicators of a smaller social network, such as living alone, having less contact with family, friends or neighbors, and lacking a confidant.

The observation of a greater frequency of depression among those less satisfied with the primary care physician is expected. This is because depression can be exacerbated given when there is low match between the level of health and expectations regarding its expectations, the former partly depends on medical care received.65

Finally, it was noteworthy that depression was less frequent in the females who never visited the senior citizens center; however, it was not the aim of this study to clarify the reasons for this association, and it cannot be discounted that this is an accidental finding deriving from the low number of females who went to the senior citizen center (Table 2).

Mechanisms of the Association Between Heart Failure and Depression

Two main mechanisms are known: biological and psychosocial. With regard to biological mechanisms, there is evidence that depression and heart failure share certain neurohormonal activation, heart rate disorders, increase in inflammation markers, including acute phase reactants and also, although with less evidence, some alterations in coagulation, in particular, platelet activation processes.66 Regarding psychosocial mechanisms, depression increases the risk of therapeutic noncompliance and low social support and both worsen the prognosis of heart failure.9 We have recently obtained evidence regarding our patients that rehospitalization over 6 months is more frequent in individuals presenting therapeutic noncompliance and low social support and both worsen the prognosis of heart failure.9 We have recently obtained evidence regarding our patients that rehospitalization over 6 months is more frequent in individuals presenting therapeutic noncompliance (hazard ratio [HR]=1.96; 95% CI, 1.29-2.98; unpublished data) and those with an inadequate social network (HR=1.98; 95% CI, 1.07-3.68; unpublished data). In view of this, depression would be more frequent in patients with poor functional state.

Methodological Aspects

The Geriatric Depression Scale has frequently been used to screen depression in the elderly. The cut-off point of four symptoms in the 10-item version has a sensitivity of 80.5%, specificity of 78.3%, positive predictive value of 86.8%, and negative predictive value of 60.2%, when compared to the ICD-10 criteria, for diagnosing a major depressive episode in ambulatory patients.14 When the DSM-IV criteria were used, the values for the validity of the previous criteria were, respectively, 84.8, 67.7, 73.7, and 80.8.25 In elderly hospitalized patients with an acute picture, a cut-off value of three symptoms in the 10-item version provides a sensitivity of 88% and specificity of 75%.15

Finally, in Spain, there is evidence supporting the validity of the 30-item version of the Geriatric Depression Scale for screening depression in the elderly in primary health care.16 Although the previous data support the validity of the Geriatric Depression Scale, it is difficult to compare the frequency of depression between studies. Koening et al17 showed that the prevalence of depression in patients with heart failure could even double depending on the diagnostic instrument used. Neither is it possible to ignore the diagnostic difficulties involved in depression in patients with heart failure, since both disorders share some symptoms, such as fatigue or insomnia.

One of the strong points of this study is the inclusion of patients similar to those dealt with normally in clinical practice,9,65 unlike those included in therapeutic clinical trials in heart failure, trials who tend to be selected, for example, due to their low comorbidity. Due to specifically avoiding selection, great variations in LVEF and the cause of heart failure in our study. All this aids in generalizing the results to customary clinical practice, although the participants do not form a statistically representative sample of the patients with heart failure in Spain. Our study is also unique because it includes a large number of social network indicator variables, and psychosocial variables in general.

One of the study’s limitations is the small size of the sample used to analyze the data separately by sex, which could explain some of the differences between males and females in the multivariate analysis results. Wider groups of patients should be studied to clarify this aspect. However, we should also point out that, until now, no study has systematically broken down the results by sex. Finally, data analysis is cross-sectional, and thus it cannot be inferred that the association of depression with the variables studied are causal.

Practical Implications and Conclusions

Opportunistic screening for depression has been recommended in adult patients, since it is a frequent disorder, with simple diagnostic instruments and effective treatment.9 However, this is not done systematically, due to time constraints, lack of familiarity with the diagnostic instruments, etc. Thus, depression frequently remains undiagnosed and untreated.9,15 The high frequency of depression found in this study among elderly hospitalized patients with heart failure guarantees high diagnostic performance regarding screening and provides a new argument to do this in Spain. Diagnostic performance would be greater in females and patients with physical worse health, greater dependency for activities in daily life, greater social isolation and less satisfaction with their primary care physician. Furthermore, given the poor
prognosis of patients with heart failure and depression, pharmacological interventions should be optimized for such patients (angiotensin-converting enzyme inhibitors, beta-blockers, etc) as well as those lifestyle habits (diet and physical activity) that are effective in reducing rehospitalizations and mortality.36

REFERENCES


