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Prevalence of Depression and Associated Medical and Psychosocial Factors in Elderly Hospitalized Patients With Heart Failure in Spain

Pilar Guallar-Castillón,[a,b] María del Mar Magariños-Losada,[c] Carmen Montoto-Otero,[d] Ana I. Tabuenca,[a] Carlos Rodríguez-Pascual,[c] Maite Olcoz-Chiva,[c] Manuel Conde-Herrera,[e,f] Concepción Carreño,[f] Pedro Conthe,[d] Eduardo Martínez-Morentíng,[g] José R. Banegas,[a] and Fernando Rodríguez-Artalejo[a]

[a]Departamento de Medicina Preventiva y Salud Pública, Facultad de de Medicina, Universidad Autónoma de Madrid, Madrid, Spain.
[b]Departamento de Epidemiología, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA.
[c]Unidad de Geriatría, Hospital de Meixoeiro, Vigo, A Coruña, Spain.
[d]Servicio de Medicina Interna I, Hospital General Universitario Gregorio Marañón, Madrid, Spain.
[e]Departamento de Ciencias Sociosanitarias, Universidad de Sevilla, Sevilla, Spain.
[f]Servicio de Medicina Preventiva, Hospital Universitario Virgen del Rocío, Sevilla, Spain.
[g]Servicio de Cardiología, Hospital Universitario Virgen del Rocío, Sevilla, Spain.

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, 1.93-5.45), 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.*

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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 cardiaca 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 cardiaca. 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); peor puntuación en los aspectos físicos de la calidad vida (ORa = 3,14; IC del

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Correspondence: Dr. F. Rodríguez Artalejo.
Departamento de Medicina Preventiva y Salud Pública. Facultad de Medicina. Universidad Autónoma de Madrid.
Avda. Arzobispo Morcillo, s/n. 28029 Madrid. España.
E-mail: fernando.artalejo@uam.es

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ABBREVIATIONS

BADL: basic activities of daily life.
LVEF: left ventricle ejection fraction.
NYHA: New York Heart Association.

95%,1,98-4,99); 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 cardiaca (ORa = 1,71; IC del 95%, 1,93-5,45); 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 cardiaca, y se asocia con varios factores biomédicos y psicosociales. Esta elevada frecuencia, el peor pronóstico de la insuficiencia cardiaca en presencia de síntomas depresivos y la existencia de instrumentos diagnósticos sencillos y un tratamiento eficaz apoyan el cribado sistemático de la depresión en estos pacientes.

Palabras clave: *Insuficiencia cardiaca. Depresión. Ancianos. España.*

INTRODUCTION

The prognosis of heart failure continues to be poor despite the latest therapeutic advances,[1] and worsens when depressive symptoms occur.[2-4] 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.[5,6] This higher cost is not the result of more use of mental health services[5-7] and has enormous relevance since heart failure is the leading cause of hospitalization[1] and health expenditure in several developed countries.[8]

The prevalence of depression in hospitalized patients with heart failure 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.[8,9] There also is evidence that the frequency of depression in patients with cardiovascular disorders varies between regions and ethnic groups.[10] 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.[11] Since these associations depend on the patients' expectations regarding their health and other social constructs, their magnitude also can vary between countries and cultures.

In this work a screening test was used to estimate, for the first time, the prevalence of depression in elderly hospitalized patients with heart failure in Spain. Furthermore, the biomedical and psychosocial factors associated with this mental disorder are identified.

METHODS

The main features of this research have been described elsewhere.[12] 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.[13] 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.[14] 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.[15] 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,[16] left ventricle ejection fraction (LVEF) via 2D-echocardiography[17] and comorbidity via the Charlson index.[18] 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.[19] 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,[20] and the ability to carry out instrumental activities with the Lawton and Brody index.[21] Given that physical functional

limitation is very common in our context this was also assessed via the Red Cross scale.[22] Finally, it was considered that there had been previous hospitalization when the patient stated that he/she had been undergone emergency admission due to worsening of heart failure during the previous year.

3. Psychosocial variables: information was collected regarding marital status, whether the subject lived alone or not, the frequency of contact with family members and with friends or neighbors, the time spent alone at home per day, whether they had someone they could share confidences with, whether they had a caretaker, the frequency of visits to a senior citizens center, and the degree of satisfaction with their physician at the health center. Finally, the patient was asked questions regarding the infrastructure and appliances within their home. Regarding this variable, it was checked whether the household had an elevator (only in houses with more than one floor), hot water, heating, bathroom, bath or shower, refrigerator, washing machine, telephone or television, whether the patient had their own room, and, if so, whether this was often cold. A scale was constructed that added the number of deficits together and classified the infrastructure/appliances into 3 categories: high, if there were no deficits or only one; average, when there were 2 deficits; low, when there were 3 or more.

Statistical Analysis

Data from the 4 centers were combined. The prevalence of depression was calculated in patients with heart failure in the different categories of the sociodemographic, biomedical, and psychosocial variables. The differences in the frequency of depression between different categories of the same variable was evaluated via χ^2 test. The mean number of comorbidities was also calculated (Charlson index) in patients with and without depression, and compared via Student *t* test.

To estimate the association of depression (dependent variable) with the sociodemographic, biomedical, and psychosocial variables studied (independent variables), multivariate non-conditional logistic regression models were built. The selection of independent variables was made through a backwards step-wise procedure in which the entry of sex, age, and marital status was forced, regardless of their statistical significance and the remaining variables were withheld if their significance was $P<.05$. The associations of interest were summarized via odds ratio (OR) of prevalence of depression and 95% confidence intervals (CI).

Analyses were done for the total sample, and separately for each sex, with SPSS 12.0 statistical software.[23]

RESULTS

Patient Characteristics

The clinical and psychosocial characteristics of the 433 patients studied have been previously described,[12] 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 ($P<.05$) 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 ($P<.05$) 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

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***

	Total n (%)†	Males n (%)†	Females n (%)†
Age, y			
65-74	66 (42.6)	30 (36.1)	36 (50.0)
75-84	106 (51.5)	32 (38.1)	74 (60.7)
≥85	38 (52.8)	9 (40.9)	29 (58.0)
Education			
Less than primary	72 (47.4)	14 (28.0)	58 (56.9)
Primary or higher	138 (49.1)	57 (41.0)	81 (57.0)
Income according to need			
Comfortable/sufficient	51 (47.2)	16 (32.7)	35 (59.3)
Just adequate/limited/very limited	159 (48.9)	55 (39.3)	104 (56.2)
Etiology			
Ischemic heart disease	75 (48.7)	34 (41.5)	41 (56.9)
Hypertensive heart disease	112 (48.1)	33 (35.9)	79 (56.0)
Valvular heart disease	55 (53.9)	17 (43.6)	38 (60.3)
Other	75 (49.7)	26 (36.1)	49 (62.0)
Functional class (NYHA)			
I-II	114 (40.7)	43 (33.9)	71 (46.4)
III-IV	96 (62.7)§	28 (45.2)	68 (74.7)||
Left ventricle ejection fraction			
≤45%	80 (47.1)	37 (35.9)	43 (64.2)
>45%	130 (49.4)	34 (39.5)	96 (54.2)
Number of associated diseases, mean±SD			
Depressed patients	2.01±0.78	2.51±1.85	1.76±0.70
Nondepressed patients	1.68±0.59‡	1.86±0.51‡	1.47±0.66
Physical summary of the quality of life (MLWHF)			
Better than the median (>27 points)	73 (32.0)	29 (25.2)	44 (38.8)
The same as or worse than the median (≤27 points)	137 (67.3)||	42 (56.8)∏	95 (73.4)||
Basic activities of daily life (BADL)			
Independent BADL	94 (36.3)	39 (27.7)	55 (46.6)
Dependent for 1 or 2 BADL	61 (61.6)	19 (67.9)	42 (59.2)
Dependent for 3 or more BADL	55 (73.3)||	13 (65.0)∏	42 (76.4)||
Instrumental activities of daily life			
Autonomous	40 (26.7)	22 (22.9)	18 (33.3)
Dependent	170 (60.1)||	49 (52.7)∏	121 (63.7)||
Red Cross functional scale			
Minimum difficulty	106 (41.9)	39 (30.5)	67 (53.6)
Assistance with walking stick or person	84 (55.6)	24 (47.1)	60 (60.0)
Assistance of 2 people or bedridden	20 (69.0)§	8 (80.0)§	12 (63.2)
Previous hospitalization			
No	100 (42.0)	30 (28.6)	70 (52.6)
Yes	110 (56.4)§	41 (48.8)§	69 (62.2)

*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.

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

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

	Total n (%)*	Males n (%)*	Females n (%)*[a]
Marital status			
Married	97 (44.9)	52 (36.1)	45 (62.5)
Single/separated/divorced	9 (28.1)	3 (23.1)	6 (31.6)
Widow/widower	104 (56.2)‡	16 (50.0)	88 (57.5)
Living alone			
Yes	24 (53.3)	6 (60.0)	18 (51.4)
No	186 (47.9)	65 (36.3)	121 (57.9)
Contact with family members			
Daily or almost daily	108 (46.8)	36 (35.6)	72 (55.4)
≤twice a week	102 (50.5)	35 (39.8)	67 (58.8)
Contact with friends or neighbors			
Daily or almost daily	85 (44.0)	33 (36.7)	52 (50.5)
Less than almost daily	125 (52.1)	38 (38.4)	87 (61.7)
Time alone at home			
≤2 hours per day	118 (41.8)	46 (32.6)	72 (51.1)
>2 hours per day	92 (60.9)§	25 (52.1)†	67 (65.0)†
Confidante			
Yes	169 (46.4)	59 (36.9)	110 (54.5)
No	41 (59.4)†	12 (44.4)	29 (69.0)
Caretaker			
Yes	183 (48.7)	59 (36.2)	124 (58.2)
No	27 (47.4)	12 (46.2)	15 (48.4)
Domestic appliances			
High	74 (46.5)	29 (38.7)	45 (56.3)
Average	93 (48.4)	32 (36.8)	61 (58.1)
Low	43 (52.4)	10 (37.0)	33 (60.0)
Visiting a senior citizens center			
Frequently or occasionally	37 (44.0)	17 (30.4)	20 (71.4)
Never	173 (49.6)	54 (40.6)	119 (55.1)
Satisfaction with primary care physician			
Very satisfied	146 (45.2)	47 (33.6)	99 (54.1)
Less than very satisfied	64 (58.2)†	24 (49.0)	40 (65.6)

*The absolute number and percentage of patients with depression in each category of the psychosocial variables.
†$P<.05$.
‡$P<.01$.
§$P<.001$, via categories with one 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.[24,25] As in other studies in patients with heart failure,[2,3,26,27] but not all,[4,11,28] 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 3. **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)***

	Total OR (95% CI)	Males OR (95% CI)	Females OR (95% CI)
Sex			
Male	1	NA	NA
Female	1.49 (0.89-2.50)		
Age, y			
65-74	1	1	1
75-84	1.15 (0.68-1.94)	0.68 (0.31-1.48)	1.87 (0.88-3.98)
≥85	0.83 (0.40-1.72)	0.29 (0.08-1.05)	1.28 (0.52-3.19)
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)
Functional class (NYHA)			
I-II	1	–	1
III-IV	2.00 (1.23-3.24)‡	–	3.42 (1.77-6.59)§
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)§
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 (1.20-5.07)†	3.56 (1.06-11.98)†	–
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)‡
Previous hospitalization			
No	1	–	–
Yes	1.71 (1.08-2.70)†	–	–
Time alone at home			
≤2 h daily	1	1	1
>2 h daily	3.24 (1.93-5.45)§	3.55 (1.50-8.42)‡	2.86 (1.50-5.45)‡
Satisfaction with primary care physician			
Very satisfied	1	–	–
Less than very satisfied	1.90 (1.14-3.17)†	–	–
Visiting senior citizen center			
Frequently or occasionally	–	–	1
Never	–	– 0.29 (0.10-0.82)†	

*NA indicates non-applicable; NYHA, New York Heart Association.
†*P*<.05.
‡*P*<.01.
§*P*<.001.

In fact, in the literature, depression tends to be less frequent in married people,[11,25,26] although not always.[3]

Our findings are also consistent with the literature when showing that depression is more frequent in those with worse physical health,[8,9,11,28] whether measured by NYHA functional class,[2,4,27,29] the physical component of the quality of life,[29] the degree of disability in activities of daily life[3,26-28] or previous hospitalization due to heart failure in the foregoing year.[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.[2,3,5,11,29] 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[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,

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 recieved.[30]

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.[9] 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 (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.[31] 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%.[31] 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.[32] 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 al[33] 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,[34,35] 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.[36] 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.[25,37] 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.[38]

REFERENCES

1. Rodríguez-Artalejo F, Banegas Banegas JR, Guallar-Castillón P. Epidemiology of heart failure. Rev Esp Cardiol. 2004;57:163-70.
2. Jiang W, Alexander J, Christopher E, Kuchibhatla M, Gaulden LH, Cuffe MS, et al. Relationship of depression to increased risk of mortality and rehospitalization in patients with congestive heart failure. Arch Intern Med. 2001;161:1849-56.
3. Vaccarino V, Kasl SV, Abramson J, Krumholz HM. Depressive symptoms and risk of functional decline and death in patients with heart failure. J Am Coll Cardiol. 2001;38:199-205.
4. Rumsfeld JS, Havranek E, Masoudi FA, Peterson ED, Jones P, Tooley JF, et al. Depressive symptoms are the strongest predictors of short-term declines in heart status in patients with heart failure. J Am Coll Cardiol. 2003;42:1811-7.
5. Frasure-Smith N, Lesperance F, Gravel G, Masson A, Juneau M, Talajic MB, et al. Depression and health-care costs during the first year following myocardial infarction. J Psychosom Res. 2000;48:471-8.
6. Luber MP, Meyers BS, Williams-Russo PG, Hollenberg JP, DiDomenico TN, Charlson ME, et al. Depression and service utilization in elderly primary care patients. J Am Geriatr Psychiatry. 2001;9:169-76.
7. Sullivan M, Simon G, Spertus J, Russo J. Depression-related cost in heart failure care. Arch Intern Med. 2002;162:1860-6.
8. Konstam V, Moser DK, De Jong MJ. Depression and anxiety in heart failure. J Card Fail. 2005;11:455-63.
9. Joynt KE, Whellan DJ, O'Connor CM. Why is depression bad for the failing heart? A review of the mechanistic relationship between depression and heart failure. J Card Fail. 2004;10:258-71.
10. Rosengren A, Hawken S, Ounpuu S, Sliwa K, Zubaid M, Almahmeed WA, et al. INTERHEART investigators. Association of psychosocial risk factors with risk of acute myocardial infarction in 11 119 cases and 13 648 controls from 52 countries (the INTERHEART study): case-control study. Lancet. 2004;364: 953-62.
11. Havranek EP, Spertus JA, Masoudi FA, Jones PG, Rumsfeld JS. Predictors of the onset of depressive symptoms in patients with heart failure. J Am Coll Cardiol. 2004;44:2333-8.
12. Rodríguez-Artalejo F, Guallar-Castillón P, Rodríguez Pascual C, Montoto Otero C, Ortega Montes A, Nieto García A, et al. Health-related quality of life as a predictor of hospital readmission and death among patients with heart failure. Arch Intern Med. 2005;165:1274-9.
13. The Task Force on Heart Failure of the European Society of Cardiology. Guidelines for the diagnosis of heart failure. Eur Heart J. 1995;16:741-51.
14. Yesavage JA, Brink TL, Rose TL, Lum O, Huang V, Adey M, et al. Development and validation of a geriatric depression rating scale: a preliminary report. J Psychiatr Res. 1983;17:37-49.
15. Shah A, Herbert R, Lewis S, Mahendran R, Platt J, Bhattacharyya B. Screening for depression among geriatric inpatients with short versions of the geriatric depression scale. Age Ageing. 1997;26: 217-21.
16. Segovia Cubero J, Alonso-Pulpón Rivera L, Peraira Moral R, Silva Melchor L. Etiología y evaluación diagnóstica en la insuficiencia cardiaca. Rev Esp Cardiol. 2004;57:250-9.
17. Cheitlin MD, Alpert JS, Armstrong WF, Aurigemma GP, Beller GA, Bierman FZ, et al. ACC/AHA Guidelines for the Clinical Application of Echocardiography. A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee on Clinical Application of Echocardiography). Developed in collaboration with the American Society of Echocardiography. Circulation. 1997;95: 1686-744.
18. Charlson ME, Pompei P, Ales KL, MacKenzie CR. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. J Chron Dis. 1987;40:73-83.
19. Parajón T, Lupon J, González B, Urrutia A, Altimir S, Coll R, et al. Aplicación en España del cuestionario sobre calidad de vida "Minnesota Living With Heart Failure" para la insuficiencia cardiaca. Rev Esp Cardiol. 2004;57:155-60.
20. Katz S, Ford AB, Moskowitz RW, Jackson BA, Jaffe MW. Studies of illness in the aged. The index of ADL. A standardized measure of biological and psychological function. JAMA. 1963; 185:914-9.
21. Lawton MP, Brody EM. Assessment of older people. Self-maintaining and instrumental activities of daily living. Gerontologist. 1969;9:179-86.
22. Salgado A, Guillén F. Escala de valoración de incapacidad del servicio de geriatría del hospital central de la Cruz Roja Española. Rev Esp Geriatr Gerontol. 1972;4:34-8.
23. SPSS. SPSS Advanced Statistics 12.0. Chicago: SPSS Inc.; 2004.
24. The WHO World Mental Health Survey Consortium. Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization World Mental Health Surveys. JAMA. 2004;291:2581-90.
25. Alonso J, Angermeyer MC, Bernert S, Bruffaerts R, Brugha TS, Bryson H, et al; ESEMeD/MHEDEA 2000 Investigators, European Study of the Epidemiology of Mental Disorders (ESEMeD) Project. Prevalence of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. Acta Psychiatr Scand Suppl. 2004; 420:21-7.
26. Williams SA, Kasl SV, Heiat A, Abramson JL, Krumholz HM, Vaccarino V. Depression and risk of heart failure among the elderly: a prospective community-based-study. Psychosom Med. 2002;64:6-12.
27. Freedland KE, Rich MW, Skala JA, Carney RM, Davila-Roman VG, Jaffe AS. Prevalence of depression in hospitalized patients with congestive heart failure. Psychosom Med. 2003;65:119-28.
28. Koenig HG. Depression in hospitalized older patients with congestive heart failure. Gen Hosp Psychiatry. 1998;20:29-43.
29. Gottlieb SS, Khatta M, Friedmann E, Einbinder L, Katzen S, Baker B, et al. The influence of age, gender, and race on the prevalence of depression in heart failure patients. J Am Coll Cardiol. 2004;43:1542-9.
30. Wilhelm K, Wedgwood L, Malhi G, Mitchell P, Austin MP, Kotze B, et al. Great expectations: factors influencing patient expectations and doctors recommendations at a Mood Disorders Unit. J Affect Disord. 2005;88:187-92.
31. Almeida OP, Almeida SA. Short versions of the geriatric depression scale: a study of their validity for the diagnosis of a major depressive episode according to ICD-10 and DSM-IV. Int J Geriatr Psychiatry. 1999;14:858-65.
32. Fernández-San Martín MI, Andrade C, Molina J, Muñoz PE, Carretero B, Rodríguez M, et al. Validation of the Spanish version of the geriatric depression scale (GDS) in primary care. Int J Psychiatry. 2002;17:279-87.
33. Thomas SA, Friedmann E, Khatta M, Cook LK, Lann AL. Depression in patients with heart failure: physiologic effects, incidence, and relation to mortality. AACN Clin Iss. 2003;14:3-12.
34. Grupo de Trabajo de Insuficiencia Cardiaca de la Sociedad Española de Medicina Interna. La insuficiencia cardiaca en los servicios de medicina interna (estudio SEMI-IC). Med Clin (Barc). 2002;118:605-10.

35. García Castelo A, Muñiz García J, Sesma Sánchez P, Castro Beiras A, en representación del grupo de estudio INCARGAL. Utilización de recursos diagnósticos y terapéuticos en pacientes ingresados por insuficiencia cardiaca: influencia del servicio de ingreso (estudio INCARGAL). Rev Esp Cardiol. 2003;56: 49-56.
36. Pignone MP, Gaynes BN, Rushton JL, Burchell CM, Orleans CT, Mulrow CD, et al. Screening for depression in adults: a summary of the evidence for the U.S. Preventive Services Task Force. Ann Intern Med. 2002;136:765-76.
37. Ciurana R. Detectar la depresión: el primer paso hacia un tratamiento más eficaz. Aten Primaria. 2002;29:336-7.
38. Swedberg K, Cleland J, Dargie H, Drexler H, Follath F, Komajda M, et al. Grupo de Trabajo de Diagnóstico y Tratamiento de la Insuficiencia Cardiaca Crónica de la Sociedad Europea de Cardiología; Comité de la ESC para la elaboración de las Guías de Práctica Clínica. Guías de práctica clínica sobre el diagnóstico y tratamiento de la insuficiencia cardiaca crónica. Versión resumida (actualización 2005). Rev Esp Cardiol. 2005;58:1062-92.