Specialty-related differences in the epidemiology, clinical profile, management and outcome of patients hospitalized for heart failure

The OSCUR study

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Aims This study was designed to identify potential specialty-related differences in the epidemiology, clinical profile, management and outcome of patients hospitalized for congestive heart failure in departments of cardiology or internal medicine.

Methods and Results From 1 July to 31 December 1998, we prospectively recorded epidemiological and clinical data from patients with congestive heart failure consecutively admitted to 11 departments of cardiology and 12 departments of internal medicine in Liguria, a northern area of Italy. The overall study population included 749 patients; 22% were treated by cardiologists and 78% by internists (P<0·0001). Patients managed by cardiologists were more likely to undergo echocardiography (92% vs 37%), Holter monitoring (25% vs 3%) and exercise stress testing (20% vs 0·5%) than those managed by internists (P<0·001). At discharge, patients treated by cardiologists were more likely to be prescribed beta-blockers (41% to 4%) and ACE inhibitors (100% to 74%) than those treated by internists (P<0·001), and the latter medication at higher dosages by cardiologists than internists. In addition, patients followed by cardiologists were younger (70 ± 9 to 79 ± 1 years; P<0·0001), more likely to be male (61% to 50%; P=0·011) and to have coronary artery disease (57% to 45%; P<0·006) than those followed by internists. Conversely, patients followed by internists were more likely to have diabetes, chronic obstructive pulmonary disease, atrial fibrillation and renal failure (P<0·03). In the overall study population, 53 patients (7%) died during hospitalization. Patients treated by cardiologists had a mortality not significantly different from that of patients treated by internists (10% and 6%, respectively; P=0·067), although congestive heart failure was more severe on admission in patients treated by cardiologists.

Conclusion Cardiologists follow published guidelines for congestive heart failure more strictly than internists, but treat a smaller number of patients who are younger, have more severe congestive heart failure and fewer co-morbidities than those managed by internists.

Key Words: Heart failure, cardiologists, internists.

See page 530 for the Editorial comment on this article

Introduction

Congestive heart failure is a major public health problem that afflicts approximately 1 to 2% of the general population, with an increasing prevalence of up to 6 to 10% in subjects older than 65 years[1–3], and it is the only major cardiovascular disorder that has shown an
increased incidence during the past 40 years[4,5]. Also, of all patients hospitalized for congestive heart failure, one third are readmitted to hospital within 90 days after discharge[6,7]. Indeed, congestive heart failure accounts for a substantial portion of health care costs in the western world. In Italy, congestive heart failure has become the fifth leading cause of hospitalization in adults, accounting for almost 130 000 of hospital admissions in 1996, at an estimated annual cost of about 1-3 billion dollars.

Over the past 15 years, randomized, controlled trials of drug therapy have produced major advances in the treatment of congestive heart failure and have demonstrated that angiotensin-converting enzyme (ACE) inhibitors[8], beta-blockers[9], spironolactone[10], and diuretics[11] improve patient clinical status and survival. Therefore, daily clinical practice should now be based on the sound evidence derived from these well-controlled clinical trials. However, despite the abundant literature on the results of these studies and the large diffusion of guidelines for treatment of congestive heart failure[11-15], it remains uncertain to what extent this scientific knowledge has been implemented in clinical practice. Indeed, the available data regarding the management of congestive heart failure patients outside the context of large trials are scarce[16-20], usually based on retrospective analyses of hospital administrative data[16,18,19] and mainly obtained before the release of international guidelines for management of congestive heart failure[16,19]. In addition, patients with congestive heart failure are not exclusively under the care of cardiologists; indeed, the vast majority are managed by non-cardiologists.

In the present study, we prospectively investigated a large cohort of more than 700 patients hospitalized for congestive heart failure in cardiology or internal medicine departments. The purpose of our study was to identify potential specialty-related differences in the epidemiology, clinical profile, management and hospital outcome in this patient population.

**Methods**

**Patient enrollment**

The present OSCUR (Outcome dello Scompenso Cardiaco in relazione all’Utilizzo delle Risorse) study prospectively evaluated all patients with congestive heart failure admitted, between 1 July to 31 December 1998, to 11 of the 18 departments of cardiology (two departments with catheterization laboratory facilities), and 12 of 30 departments of internal medicine in Liguria, a northern area of Italy with about 1 600 000 inhabitants. The only requirement for entry into the OSCUR study was an event of congestive heart failure reported at discharge as primary or secondary diagnosis. The study was approved by the ethical committee of the Ente Ospedaliero Ospedali Galliera, Genoa, Italy.

**Data collection**

At the time of patient discharge, data from the history, physical examination, blood tests, and other diagnostic procedures, as well as data regarding the in-hospital patient course and complications were recorded on a standardized form by full-time research fellows, who were recipients of a grant funded by the OSCUR study committee. Research fellows were not involved in any way in patient care. Informed consent for inclusion into the study and use of the recorded clinical data were obtained from all patients. In order to avoid including patients in the investigation more than once, we analyzed only the first hospitalization during the study period for any given patient.

Potential specialty-related differences in the epidemiology and clinical profile of the study population were investigated by assessing demographic data, probable aetiology of congestive heart failure, co-morbidities, and patient New York Heart Association (NYHA) functional class at hospital admission. Serum creatinine and sodium levels, cardiothoracic ratio on chest X-ray, and use of intravenous positive inotropic or vasodilator agents during hospitalization were also utilized as additional markers of illness severity. Potential differences in overall patient management were assessed by comparing frequency in the use of diagnostic cardiological tests during hospitalization and pharmacological treatment prescribed at discharge, as well as differences in patient referral for follow-up (to a general practitioner, a dedicated outpatient clinic, or a cardiologist).

Evaluation of in-hospital outcome included the length of hospital stay, patient’s NYHA functional class at discharge and total mortality. At hospital discharge, physical capacity was evaluated by the 6 min walk test; this was the only test strongly recommended to the physicians participating in the study. The 6 min walk test was conducted using a standardized approach[21,22]. A 25 m course was marked in a level enclosed corridor and a chair was placed at each end. Patients were transported to the start of the course by wheelchair and instructed to walk from end to end at their own pace, while attempting to cover as much ground as possible in 6 min. Patients were also allowed to use their usual mobility aids. An attending physician or an experienced nurse timed the walk test, calling out the time every 2 min and encouraging the patient every 30 s in a standardized manner. Patients were allowed to slow or stop and rest during the walk, but were asked to resume walking as soon as they felt able. After 6 min the distance walked was measured to the nearest metre.

**Statistical analysis**

The data analysis was performed by the Associazione Nazionale Medici Cardiologi Ospedalieri (ANMCO) Research Center. Continuous variables were expressed as mean ± SD. Differences between continuous variables were evaluated by using the unpaired two-tailed
Student’s t-test. Discrete variables were summarized by frequency percent. Differences between discrete variables were assessed by using the chi-square test, with the Fisher exact test when necessary. A P value <0·05 was statistically significant.

Results

Patient population

A total of 749 consecutive patients with congestive heart failure were enrolled in the study, 393 (52%) were male. Age ranged from 36 to 98 years, (mean 76±11). Cardiac heart failure was the primary discharge diagnosis in 527 (70%) of the patients. Internists were responsible for the management of 584 patients (78%) and cardiologists for the remaining 165 (22%). The baseline demographics and clinical features of patients treated by internists and cardiologists are summarized in Table 1. Patients managed by cardiologists were significantly younger, more frequently male, and had a higher prevalence of established coronary disease (70% and 50% of patients, \(P<0.0001\)), as reflected by the frequency of myocardial infarction or documented coronary artery disease. Also, patients managed by cardiologists were hospitalized after a longer duration of symptoms and more severe congestive heart failure, as manifested by the higher frequency of pulmonary oedema or cardiogenic shock (36%) on admission, compared to patients managed by internists (20%) (\(P<0.0001\)); cardiologist-managed patients also had a significantly higher prevalence of serum sodium at less than 130 mEq·l\(^{-1}\) (\(P<0.0001\)) (Table 1). Conversely, patients managed by internists showed a higher frequency of diabetes, chronic obstructive pulmonary disease, chronic atrial fibrillation, and renal failure (\(P=0.04\)). Prevalence of systemic arterial hypertension and valvular heart disease was similar between the two groups (\(P>0.05\)).

Patient evaluation

In the overall study population, the more commonly used cardiac procedures for patient evaluation included echocardiography and Holter electrocardiographic monitoring (49% and 8% of the patients, respectively); such tests were utilized 2·5 times and 1·4 times more frequently by cardiologists than internists (\(P=0.0001\)). Less commonly used procedures included coronary angiography and exercise stress testing, which were performed in 3% and 1% of the study patients, respectively. These procedures were used 40 times and 23 times more frequently by cardiologists than internists (\(P=0.0001\)) (Fig. 1).

Patient treatment

During hospitalization, i.v. vasodilator and i.v. positive inotropic medications were used 1·6 and 1·8 times more frequently by cardiologists than internists (\(P<0.001\)).
discharge, specific contraindications to beta-blockers or ACE inhibitors were present in 11% and 18% of all study patients. In patients without specific contraindications to these drugs, beta-blockers and ACE inhibitors were prescribed 12 and 1·4-times more frequently, and at higher dosages, by cardiologists than internists (Table 2) (Fig. 2). In particular, ACE inhibitors were used more frequently in younger patients (77 ± 10 vs 80 ± 10 years, \(P=0.001\)) and in patients with fewer co-morbidities (51% vs 70% \(P=0.002\)). With regard to other medications often utilized in patients with congestive heart failure, anticoagulants, spironolactone and amiodarone were prescribed in 44%, 35% and 16% of patients treated by cardiologists and in 28%, 6% and 6%, respectively, in those treated by internists \(P<0.0001\) (Table 2). Diuretic agents, digoxin and nitrates were prescribed with similar frequency by cardiologists and internists \(P \geq 0.05\).

Cardiologists and internists showed significant differences regarding the way they combined different drugs (Table 3). Among the various possible therapeutic combinations of ACE inhibitors, beta-blockers, digoxin and diuretics, the combination of digoxin and diuretics was more frequently used by internists than by cardiologists. Conversely, cardiologists used the combination which included beta-blockers in a significantly higher percentage of patients (26% and 2% of patients, \(P<0.0001\)) than internists. The combinations of ACE inhibitors and diuretics, or ACE inhibitors, digoxin and diuretics (the ‘triple’ therapy) were employed in a similar percentage of cardiologist- and internist-treated patients.

### Clinical outcome

In the overall study population, 53 patients (7%) died during hospitalization. These patients had a mean age significantly higher than that of those discharged alive (81 ± 1 and 76 ± 1 years, respectively; \(P<0.001\)). Among 175 patients hospitalized with cardiogenic shock or pulmonary oedema the mortality was particularly high; 30 patients (17%) died and 10/30 had an acute myocardial infarction. Although patients treated by cardiologists had more severe congestive heart failure on admission (Table 1), they had a similar duration of hospitalization and total hospital mortality, as well as a similar functional class at discharge, than patients treated by internists (Table 4).

### Table 2 Type and dosages (in daily mg) of medications prescribed at hospital discharge by internists and cardiologists, and percentages of patients taking them (in parentheses)

<table>
<thead>
<tr>
<th>Medications prescribed</th>
<th>Patients treated by internists (n=548)</th>
<th>Patients treated by cardiologists (n=148)</th>
<th>(P) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE inhibitors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enalapril</td>
<td>13 ± 8 (24%)</td>
<td>21 ± 12 (41%)</td>
<td>0.001 (&lt;0.0001)</td>
</tr>
<tr>
<td>Lisinopril</td>
<td>10 ± 7 (15%)</td>
<td>13 ± 10 (10%)</td>
<td>0.17 (0.10)</td>
</tr>
<tr>
<td>Captopril</td>
<td>44 ± 32 (9%)</td>
<td>80 ± 32 (9%)</td>
<td>0.0005 (0.79)</td>
</tr>
<tr>
<td>Quinapril</td>
<td>17 ± 9 (3%)</td>
<td>15 ± 16 (3%)</td>
<td>0.61 (0.89)</td>
</tr>
<tr>
<td>Ramipril</td>
<td>5 ± 2 (5%)</td>
<td>9 ± 3 (10%)</td>
<td>&lt;0.0001 (0.05)</td>
</tr>
<tr>
<td>Beta-blockers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carvedilol</td>
<td>19 · 3 ± 8 · 5 (2%)</td>
<td>29 ± 24 · 1 (23%)</td>
<td>0.186 (0.0001)</td>
</tr>
<tr>
<td>Metoprolol</td>
<td>— (0%)</td>
<td>68 ± 54 (7%)</td>
<td>— (&lt;0.0001)</td>
</tr>
<tr>
<td>Atenolol</td>
<td>52 ± 31 (1%)</td>
<td>33 ± 14 (2%)</td>
<td>0.39 (0.49)</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amiodarone</td>
<td>237 ± 125 (6%)</td>
<td>220 ± 91 (16%)</td>
<td>0.58 (0.002)</td>
</tr>
<tr>
<td>Digoxin</td>
<td>0·143 ± 0·07 (65%)</td>
<td>0·145 ± 0·06 (70%)</td>
<td>0.13 (0.23)</td>
</tr>
<tr>
<td>Doxazosin</td>
<td>4 ± 2 (3%)</td>
<td>6 ± 1 (7%)</td>
<td>0.055 (0.06)</td>
</tr>
<tr>
<td>Furosemide</td>
<td>65 ± 85 (86%)</td>
<td>69 ± 84 (90%)</td>
<td>0.71 (0.19)</td>
</tr>
<tr>
<td>Losartan</td>
<td>50 ± 18 (3%)</td>
<td>44 ± 23 (7%)</td>
<td>0.47 (0.03)</td>
</tr>
<tr>
<td>Spironolactone</td>
<td>99 ± 61 (6%)</td>
<td>75 ± 39 (35%)</td>
<td>0.023 (&lt;0.0001)</td>
</tr>
<tr>
<td>Nitroderivates</td>
<td>20 ± 21 (48%)</td>
<td>26 ± 32 (44%)</td>
<td>0.07 (0.07)</td>
</tr>
</tbody>
</table>

*Fig. 1 Main diagnostic procedures used during hospitalization. ANGIO=coronary angiography; ECHO=echocardiography; ETT=exercise treadmill test; HOLTER=electrocardiogram Holter monitoring. □=cardiologists; ■=internists.*
The 6 min walk test was performed in 271 of the study patients, 207 cared for by internists and 64 by cardiologists. The mean distance covered during the test was 270 ± 141 m in patients cared for by internists and 306 ± 114 m in patients cared for by cardiologists (P = 0.06). The test had not to be prematurely terminated or associated with complications in any of the patients. In 125 study patients (31 cardiologist- and 94 internist-treated patients), the 6 min walk test was not performed for the following reasons: severe confusion or communication disorder (n = 20), hemiparesis (n = 5), orthopaedic problems or severe arthritis (n = 70), NYHA functional class IV (n = 14), and severe asthenia (n = 16).

At discharge, 515 study patients (74%) were referred to their general practitioner, 120 (17%) to dedicated outpatient clinics, and 61 (9%) to a cardiologist. Cardiologists were more likely than internists to refer patients to dedicated outpatient clinics or to other cardiologists (P < 0.0001). Conversely, internists referred more than 80% of patients to general practitioners (Table 4).

**Discussion**

The OSCUR study has investigated, in an era of large trials and guidelines, potential specialty-related differences in the epidemiology, clinical profile, management and outcome of patients hospitalized for congestive heart failure in departments of cardiology and internal medicine in a pre-defined geographic area. The results of the study show that only a minority of patients with congestive heart failure are treated by cardiologists and

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**Figure 2** Main pharmacotherapies prescribed at hospital discharge for treatment of congestive heart failure. □ = cardiologists; ■ = internists.

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**Table 3** Drug associations prescribed by internists and cardiologists at hospital discharge in patients with congestive heart failure

<table>
<thead>
<tr>
<th>Drug associations prescribed</th>
<th>Patients treated by internists (n = 548)</th>
<th>Patients treated by cardiologists (n = 148)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE or B or Dig or D</td>
<td>94 (17%)</td>
<td>24 (16%)</td>
<td>0.82</td>
</tr>
<tr>
<td>ACE + D</td>
<td>122 (26%)</td>
<td>29 (24%)*</td>
<td>0.78</td>
</tr>
<tr>
<td>Dig + D</td>
<td>108 (20%)</td>
<td>12 (8%)</td>
<td>0.004</td>
</tr>
<tr>
<td>ACE + Dig + D</td>
<td>198 (42%)*</td>
<td>48 (40%)*</td>
<td>0.81</td>
</tr>
<tr>
<td>B + Dig + D</td>
<td>3 (1%)*</td>
<td>4 (3%)*</td>
<td>0.019</td>
</tr>
<tr>
<td>ACE + B + Dig + D</td>
<td>5 (1%)*</td>
<td>28 (23%)*</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>ACE + D</td>
<td>18 (4%)*</td>
<td>3 (3%)*</td>
<td>0.50</td>
</tr>
</tbody>
</table>

*Percentage of patients without specific contraindications to drugs considered. ACE = ACE inhibitors; B = beta-blockers; Dig = digitalis; D = diuretics.

**Table 4** Total mortality, NYHA functional class and patient referral at hospital discharge

<table>
<thead>
<tr>
<th></th>
<th>Patients treated by internists (n = 584)</th>
<th>Patients treated by cardiologists (n = 165)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total mortality</td>
<td>36 (6.2%)</td>
<td>17 (10.3%)</td>
<td>0.067</td>
</tr>
<tr>
<td>Duration of hospitalization (days)</td>
<td>11 ± 7</td>
<td>11 ± 7</td>
<td>0.93</td>
</tr>
<tr>
<td>NYHA functional class at discharge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>79 (14%)</td>
<td>15 (10%)</td>
<td>0.11</td>
</tr>
<tr>
<td>II</td>
<td>361 (66%)</td>
<td>108 (73%)</td>
<td>0.76</td>
</tr>
<tr>
<td>III</td>
<td>100 (18%)</td>
<td>19 (13%)</td>
<td>0.15</td>
</tr>
<tr>
<td>IV</td>
<td>8 (1%)</td>
<td>6 (4%)</td>
<td>0.07</td>
</tr>
<tr>
<td>Referral at discharge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General practitioner</td>
<td>464 (85%)</td>
<td>51 (34%)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Outpatient clinic</td>
<td>58 (10%)</td>
<td>62 (42%)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Cardiologist</td>
<td>26 (5%)</td>
<td>35 (24%)</td>
<td>&lt; 0.0001</td>
</tr>
</tbody>
</table>
that such patients are significantly different from those treated by internists with regard to their demographic and clinical features. When compared to internist-treated patients, those under the care of cardiologists were younger, more likely to be male and to have coronary artery disease, and less likely to have diabetes, obstructive pulmonary disease, chronic atrial fibrillation and chronic renal failure. In addition, patients under the care of cardiologists had more severe congestive heart failure, underwent a higher number of diagnostic cardiac tests, were more likely to be treated with drugs shown to reduce morbidity and mortality for congestive heart failure in clinical trials and with such drugs titrated to higher dosages.

Patients with congestive heart failure encountered in daily hospital practice are different from the ‘typical trial patient’

Since the OSCUR study was prospective, and participation in the study did not require any pre-defined selection criterion, the OSCUR study patients represent a sample of a general population of patients hospitalized for congestive heart failure. The mean age of patients enrolled in our study was 76 years, 52% of patients were males, 58% of the study patients had co-morbidities, and 91% were in III to IV NYHA functional class. These demographic and clinical data parallel the findings obtained by Senni et al. in 216 new cases of definite congestive heart failure identified in Olmsted County[23], and by Philbin et al. in 45 894 patients discharged from New York State hospitals with a diagnosis of congestive heart failure in 1993[24], confirming that congestive heart failure is a disease of the elderly (being patients ≥65 years in more than 80% of cases), and that in patients treated in daily clinical practice congestive heart failure usually coexists with many co-morbidities. Therefore, a large proportion of community- and hospital-based patient populations with congestive heart failure encountered in real life are not well represented in major congestive heart failure clinical trials. Such trials mainly include outpatients with ages ranging from 50 to 70 years, predominantly males, with congestive heart failure as the primary diagnosis, predominantly in II or III NYHA functional class, and usually with no or minor co-morbidities[25–27].

The prevalence of ACE inhibitors and beta-blockers prescribed in the OSCUR study (80% and 12%, respectively) was higher than that reported in other studies of similar, unselected populations[28,29]. However, a minority of patients were discharged while taking target doses proven to improve survival in clinical trials. The greater use of these drugs in the OSCUR study patients may be due to both the fact that the study was carried out after release of specific guidelines[11–14] and that we focused only on the patients who did not show specific contraindications to these agents. Our data on ACE inhibitors compare favourably with 80% of patients treated with this drug reported in the SPICE registry, which included only hospital physicians who participated in clinical trials[37], and with the data from the MISCHF study[38] in which ACE inhibitors were prescribed in 78% of patients at discharge, taking into account that 60% of these patients were attended by or received consultative care from a cardiologist.

Differences between cardiologists and internists in the use of diagnostic procedures during hospitalization

Patients cared for by internists underwent fewer diagnostic cardiac tests than patients treated by cardiologists. Echocardiography was the most frequently used test in the OSCUR study population. However, only one third of the patients treated by internists underwent echocardiography, whereas it was performed in almost all cardiologist-treated patients. These findings parallel those reported by other investigators studying both congestive heart failure[18,20] or other cardiac syndromes, such as myocardial infarction and unstable angina[31–33].

Extensive use of echocardiography in patients with congestive heart failure is in keeping with clinical practice guidelines for assessing left ventricular function[11–14], and supported by data from Senni et al. showing that under-use of echocardiography in congestive heart failure patients was associated with a lower use of ACE inhibitors and with poorer survival[34]. The greater use of stress tests and cardiac catheterization by cardiologists is also in accord with the guideline recommendations to correct reversible causes of congestive heart failure, including myocardial ischaemia, and it could be related to the higher prevalence of coronary artery disease in cardiologist- than in internist-treated patients.

On the other hand, in our study population there are many factors that may explain the under-use of echocardiography in patients cared for by internists. The patient population treated by internists was ‘very old’ with a mean age of 78 years, and with concomitant diseases that may affect quality of life and survival more than congestive heart failure. Therefore, a less aggressive approach may have been chosen in these patients. Also, an important reason for under-use ofcardiological diagnostic tests by internists may be their limited access to such tests, in particular echocardiography.

Differences between cardiologists and internists in the therapy prescribed at hospital discharge

An encouraging finding of the OSCUR study was the high percentage of patients without specific contraindications who were treated with ACE inhibitors by both cardiologists and internists (100% and 74% respectively). However, 26% of internist patients not treated with
ACE inhibitors lacked medical record documentation indicating why these medications were not prescribed. In addition, cardiologists prescribed higher daily doses of ACE inhibitors than internists and more often achieved the target doses proven to improve survival in clinical trials. This disparity might be due to more aggressive treatment of patients or/and to a better application of the guideline recommendations by cardiologists. However, an important reason for the lack of full adoption of indications derived from randomized trials by internists is that their patients were significantly older and had a higher prevalence of co-morbidities than patients treated by cardiologists. Indeed, when considering the effect of ageing on pharmacokinetic and renal function and the potential interaction of ACE inhibitors with other medications needed for treatment of concomitant diseases, it is not surprising that guidelines derived from clinical trials may be difficult to apply to an important number of patients followed by internists. The limited access of internists to echocardiography may also partially explain their lower use of ACE inhibitors because measurements of left ventricular function help to select the appropriate treatment\[34\]. Moreover, the caution of internists in increasing the doses of ACE inhibitors to the target doses used in large mortality trials may also be due to the lack of data regarding the optimal dosages of these agents in elderly patients. In addition, although there are many theoretical advantages in the use of high-dose ACE inhibitors, two recent studies did not show concordant results; one showed a small advantage of a high over a low-dosage of ACE inhibitors in the progression of congestive heart failure\[35\], while the other did not identify a relationship between dosage and outcome\[36\].

Beta-blockers were used in about 40\% of cardiologist-treated patients without specific contraindications and in less than 5\% of patients treated by internists. This relatively low percentage of patients treated with beta-blockers, particularly in internist-treated patients, may be explained by the fact that the translation of results of trials on this class of drugs into practice is more difficult since beta-blockers have long been contraindicated in congestive heart failure patients, and these trials are more recent than those on ACE inhibitors.

Cardiologist care was associated with a greater use of resources and therapy; however, no improvement in hospital survival was observed. These data are similar to previous studies\[37–39\] and could probably be explained by the different burden of severity of disease in the patients managed by cardiologists.

Implications for health policy

The results of the OSCUR study may help in understanding the epidemiology, clinical profile and current management of community patients with congestive heart failure and raise several important issues. First, since patients with congestive heart failure encountered in daily hospital practice appear to differ substantially from the ‘typical trial patient’, the efficacy of the same drugs at the dosages titrated in clinical trials is questionable\[40\]. Implementation of clinical practice guidelines needs to take into account the high prevalence of advanced age and concomitant diseases in congestive heart failure\[41\]. Second, since it is difficult to decide where to allocate limited financial resources in an area with increasing societal burden and costs (such as congestive heart failure), prospective trials are needed to assess whether the results of management of congestive heart failure in departments of internal medicine or cardiology are associated with different cost/effectiveness. Finally, since about 70\% of congestive heart failure patients discharged from hospital are referred to general practitioners who have been found to use fewer ACE inhibitors and beta-blockers than cardiologists and internists\[29\], efforts to implement the guidelines for management of congestive heart failure into the clinical practice of general practitioners would be expected to translate into better quality of life, reduction in hospital readmission and lives saved.

Conclusions

The OSCUR study identifies potentially important differences between cardiologists and internists in the management of patients with heart failure. Patients treated by cardiologists were younger, more frequently had coronary disease, had more severe symptoms and underwent more diagnostic procedures than those managed by internists. Also they were treated more closely following guideline recommendations, and at discharge they were mainly referred to hospital for subsequent evaluations.

Internists showed a less aggressive approach to their patients in terms of therapy and utilization of resources. However, the older age of internist-treated patients and the higher prevalence of co-morbidities probably justified a more cautious approach.

References


Packer M, Cohn JN. Consensus recommendations for the management of chronic heart failure. Am J Cardiol 1999; 83: 1A–38A.


Appendix

Steering committee members

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Study participants and centres

Cardiology

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Ospedale Civile Lavagna: M. Brignole, C. Marsano, G. Lupi;
Ospedale S. Corona Pietra Ligure: C. Mattiauda, P. Bellone;
Ospedale Civile Rapallo: G. Gigi;
Ospedale Sampierdarena: V. Seu;
Ospedale San Martino: U. Martini, G. Terzi;
Ospedale Sanremo: G. C. Bensa;

Eur Heart J, Vol. 22, issue 7, April 2001
Internal medicine

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