

Prevalence, aetiology and management of heart failure in general practice

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SUMMARY

Background. *There is a high level of morbidity and mortality among patients with heart failure. Management of the condition has changed substantially in recent years. However, there is little information on the management of heart failure in general practice.*

Aim. *A study was carried out in 1994 to assess the prevalence, aetiology and management of heart failure in a general practice setting.*

Method. *A retrospective review was undertaken of the manual and computerized medical records of patients in two group practices in Liverpool (combined patient population of 17 400).*

Results. *A total of 266 patients with heart failure were identified (a prevalence of 15 per 1000). The two practices had 2747 patients who were aged 65 years and over and 221 of these had heart failure (prevalence of 80 per 1000). The principal aetiological factor considered responsible for heart failure was: coronary heart disease in 45% of patients, hypertension 18%, valve disease 9%, cor pulmonale 7%, cardiomyopathy 2% and a metabolic problem 2% (aetiology unknown in 17% of cases). Urea and electrolytes had been checked in the last year in 59% of patients. Chest x-ray and electrocardiography had been performed in 89% and 80% of patients, respectively, and echocardiography in 30%. Angiotensin converting enzyme (ACE) inhibitors were being prescribed to 33% of patients.*

Conclusion. *The study found a high prevalence of heart failure among patients aged 65 years and over. Coronary heart disease was considered to be the main aetiological factor. Patients were being investigated mainly by means of chest x-ray and electrocardiography. Most patients with heart failure were not receiving treatment with ACE inhibitors. Evaluation of heart failure by clinical criteria alone is now deemed insufficient. Echocardiography should be used routinely to assess cardiac dysfunction. Patients with confirmed left ventricular dysfunction will benefit from treatment with ACE inhibitors unless contraindications exist. The study suggests that there is a need to explore ways of optimizing the management of patients with heart failure.*

Keywords: *heart failure; morbidity; aetiology; management of disease.*

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© British Journal of General Practice, 1996, 46, 77-79.

Introduction

THE prognosis of heart failure is poor, with population-based studies showing that fewer than 50% of patients survive five years from the time of initial diagnosis.^{1,2} Apart from the known adverse effects on patients' survival and quality of life,³ there are major financial costs. Heart failure has been estimated to cost the National Health Service £360 million annually.⁴ Each year in the United Kingdom there are approximately 120 000 hospital admissions of patients with heart failure.⁵ The average inpatient stay is about two weeks.⁶

The management of heart failure has changed substantially in recent years. Greater emphasis is now placed on identifying underlying causes and initiating appropriate treatment where possible. In addition, there is now a greater interest in early identification and prevention of progression of left ventricular dysfunction, and echocardiography is seen as a key investigation.⁷ Large trials have clearly demonstrated that in patients with left ventricular dysfunction, angiotensin converting enzyme (ACE) inhibitors reduce morbidity and mortality in mild, moderate and severe heart failure.^{8,9}

There is little information on the management of heart failure in the primary care setting. A study was undertaken in 1994 to assess the prevalence and aetiology of heart failure while also examining how patients with heart failure are investigated and treated in general practice.

Method

The study population comprised all patients registered with two Liverpool group practices, a total of 17 405 patients. The two practices had 2747 patients who were aged 65 years and over. Both practices were fully computerized.

Diagnosis of heart failure

Four researchers undertook a retrospective review of all computerized and manual medical records to identify patients who had a diagnosis of heart failure and/or were receiving prescriptions for diuretics, digoxin or ACE inhibitors. The principal investigator re-reviewed some of the records examined by the other researchers in order to check for consistency and accuracy in data collection.

A diagnosis of heart failure was confirmed if there was clearly documented evidence in the computerized or manual records of any of the following: pulmonary oedema confirmed clinically or by chest x-ray; clinical, electrocardiographic or echocardiographic evidence of heart disease where symptoms of dyspnoea improved on taking anti-failure medication and relapsed on discontinuing treatment; or peripheral oedema combined with a raised jugular venous pressure. These criteria have been used elsewhere¹⁰ and were chosen so that comparisons could be made with previous work.

Aetiology

Having identified patients with heart failure, the main aetiological factors were then ascertained by review of the notes. The aetiology of heart failure was classified as follows: coronary heart disease (based on a history of myocardial infarction, coron-

ary artery bypass grafting or angioplasty, abnormal coronary angiography or a clear history of angina); hypertension (based on blood pressure readings above 160/95 mmHg on at least two occasions noted in the medical records); valve disease (confirmed clinically in the notes, usually by echocardiography); cor pulmonale (based on a history of lung disease with associated clinical and investigatory features); cardiomyopathy (confirmed by echocardiography); and metabolic problems. In those patients in whom none of the above applied, a diagnosis of unknown aetiology was noted.

Management

The medical records were then scrutinized to determine what investigations had been performed for each of the patients. Evidence that blood urea and electrolytes had been checked to assess renal function in the preceding 12 months and that electrocardiography, chest x-ray and echocardiography had been performed were chosen as relevant investigations.

The different drugs and their dosages used in the management of heart failure were recorded. For those being prescribed ACE inhibitors it was noted whether such drugs had been initiated by the general practitioner or a hospital physician. Patients who were not being prescribed ACE inhibitors had their records examined to ascertain whether there was a history of an adverse reaction to ACE inhibitors or whether other contraindications to their use existed.

Results

Prevalence of heart failure

Of the 17 405 patients registered with the two practices 266 patients with heart failure were identified (a prevalence of 15.3 per 1000). The age-sex distribution of the patients with heart failure in the two practices is shown in Table 1. A total of 221 out of 2747 patients aged 65 years and over had heart failure (prevalence of 80.5 per 1000). There was no significant difference in the prevalence of heart failure between the sexes except in the age group 55-64 years where a higher prevalence of heart failure was found among men (Fisher's exact test $P < 0.05$, 95% confidence interval 0.21 to 0.92).

Aetiology

The principal aetiological factor considered responsible for heart failure among all 266 patients was: coronary heart disease 45.1% of patients, hypertension 18.0%, valve disease 9.0%, cor pulmonale 6.8%, cardiomyopathy 2.3%, metabolic problem 1.9%, and unknown in 16.9% of patients. Coronary heart disease was the major underlying cause of heart failure. There were no cases identified of heart failure secondary to congenital heart disease.

Table 1. Prevalence of heart failure in two practices, by age and sex of patients.

Age range (years)	No. of patients with heart failure (rate ^a)	
	Women	Men
35-44 ($n = 1184/1173$)	1 (0.8)	0
45-54 ($n = 919/915$)	6 (6.5)	5 (5.5)
55-64 ($n = 888/802$)	11 (12.4)	22 (27.4)*
65-74 ($n = 891/737$)	45 (50.5)	39 (52.9)
75+ ($n = 724/395$)	96 (132.6)	41 (103.8)

n = number of women/men patients in age group in practices. ^aPer 1000 patients. Difference between women and men: Fisher's exact test, * $P < 0.05$.

The metabolic causes comprised two patients whose heart failure was precipitated by severe pernicious anaemia, two whose heart failure was secondary to thyrotoxicosis and one secondary to acromegaly.

Seventy four patients (27.8%) had multiple risk factors for heart failure. For example, there were patients with severe valve disease who were waiting for a valve replacement who had coexisting angina. The main aetiological factor for heart failure was therefore listed as valve disease rather than coronary heart disease. A further 16 patients had coexisting coronary heart disease and an additional 43 patients had hypertension according to the study criteria.

Management

Urea and electrolytes had been checked in the last year in 59.0% of 266 patients. Chest x-ray and electrocardiography had been performed in 89.5% of 266 and 80.0% of 265 patients, respectively. Thirty per cent of patients (80 of 265) had undergone echocardiography.

A total of 255 of 266 patients (95.9%) were being prescribed diuretics and 70 patients (26.3%) were being prescribed digoxin. It was found that 87 patients (32.7%) were receiving treatment with ACE inhibitors. Prescribed and target daily doses of ACE inhibitors are shown in Table 2. Apart from perindopril, the target doses are those suggested from trials of heart failure treatment quoted in the 1994 United States of America Health and Human Services clinical practice guideline 'heart failure: evaluation and care of patients with left ventricular systolic dysfunction'. The target dose of perindopril is quoted in the *British national formulary*. Enalapril maleate and captopril were the most commonly prescribed ACE inhibitors. It appeared that patients were generally on conservative doses of ACE inhibitors, particularly captopril. ACE inhibitor therapy had been initiated or suggested by hospital physicians for 65 patients (74.7% of patients receiving this therapy).

Medical records revealed that 36 of all 266 patients (13.5%) were unsuitable for treatment with ACE inhibitors because of contraindications (for example aortic stenosis or mitral stenosis) or established side effects.

Discussion

Heart failure seems to be a relatively neglected topic in the general practice literature compared with other chronic diseases such as diabetes and asthma. The present study found a high prevalence of heart failure in the general practice population (15 per 1000). This figure is higher than that found in the 1981-82 morbidity statistics from general practice¹¹ which suggested a prevalence of 11 per 1000, but is in line with previous evidence that has suggested that the prevalence of heart failure is increasing.^{11,12}

The prevalence of heart failure in those aged 65 years and over was 80 per 1000. Both the prevalence in the total practice popu-

Table 2. Daily doses of ACE inhibitors prescribed to study patients, and target daily doses.

ACE inhibitor	Median (range) of prescribed dose (mg day ⁻¹)	Target dose (mg day ⁻¹)
Enalapril maleate ($n = 34$)	10 (2.5-40)	20
Captopril ($n = 28$)	37.5 (12.5-75)	150
Lisinopril ($n = 14$)	5 (2.5-20)	20
Perindopril ($n = 11$)	4 (2-6)	4

n = number of patients receiving ACE inhibitor.

lation and the prevalence in those aged 65 years and over were considerably greater than that found in a London study in 1992.¹⁰ The London study suggested a prevalence of only four per 1000 in the practice population and only 28 per 1000 in those aged 65 years and over. The criteria used to verify a diagnosis of heart failure in both studies were almost identical. The most likely explanation for the differences is that the London study was less effective in case finding because of the lack of a highly accurate records system. None of the practices that took part in the London study appeared to have been computerized; two of the participating practices did not have a records system that would allow the identification of patients receiving regular repeat prescriptions. Thus, we would contend that the prevalence of heart failure detected in the present study is more reliable because of the increased accuracy provided by well-utilized computer systems.

Information obtained from a computer system is only as accurate as the data entered onto it, and the same holds true for manual medical records. As a result, any study method which relies on retrospective medical record review has inherent limitations. However, by collecting data from both manual and computer medical records, it was possible to minimize possible deficiencies in this study method. The practices participating in the present study were conscientious in their computer use; their meticulous record keeping increased the quality of information that could be obtained.

The results indicate that the main aetiological factor for heart failure was coronary heart disease, a finding that is expected and is in keeping with other studies.¹⁰ Hypertension was still an important factor, being the second most common underlying cause. It was encouraging to see that specific aetiological factors were identifiable in most cases. This suggests that patients were being screened and/or investigated for risk factors for heart failure. However, it was interesting to note that only 30% of patients had undergone echocardiography, an investigation that is being recommended by cardiologists as part of the routine evaluation of patients with heart failure.⁷ At the time of this study, open-access echocardiography was not available to the general practitioners in the areas studied. These results provide persuasive evidence that in order to increase uptake of this valuable non-invasive tool, open access to echocardiography is essential.

Approximately 40% of patients had no record of renal function tests despite the fact that almost all were on drugs, for example diuretics, digoxin or ACE inhibitors, that are known to have possible adverse biochemical effects. This would suggest that there is a need to try to improve the routine monitoring of patients with heart failure.

Prescribing a diuretic only and delaying the introduction of ACE inhibitors for patients with left ventricular dysfunction is considered by some to be no longer supportable.¹³ ACE inhibitors have been shown to be beneficial in terms of reduced morbidity and prolonged survival in mild, moderate and severe chronic heart failure secondary to left ventricular systolic dysfunction.^{8,9,14} They have also been shown to be effective when used in the primary care setting.¹⁵ However, the present study revealed that 67% of patients with heart failure were not receiving treatment with ACE inhibitors. It also appeared that the patients were on conservative doses of ACE inhibitors when compared with the doses shown to be beneficial in clinical trials and studies.^{8,9,14,16,17}

Heart failure is an increasing problem. It would appear that for most patients an underlying cause can and should be identified and treated where possible. At present only a minority of patients are being fully investigated and receiving optimal treatment. Further education and clear guidelines on the management of patients with heart failure, analogous to the guidelines produced

for the management of patients with asthma,¹⁸ are needed. The importance of early intervention in patients with heart failure needs to be highlighted. Diagnosing the presence of heart failure reliably is the first and most important step in management, and cardiac imaging (usually echocardiography) is necessary to do this reliably.¹⁹ Unless there is a compelling contraindication, ACE inhibitors should be used routinely in primary care in the management of patients with heart failure secondary to left ventricular dysfunction.

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Acknowledgements

We thank the general practitioners and staff of the two participating practices, Dr Derek T Connelly, and Bristol Myers Squibb Pharmaceuticals Limited for their help in this project.

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