

Prevalence of heart failure in three general practices in north west London

J PARAMESHWAR

M M SHACKELL

A RICHARDSON

P A POOLE-WILSON

G C SUTTON

SUMMARY. *There is little recent information on the prevalence of heart failure in the United Kingdom. Assuming that patients with heart failure would be taking diuretic drugs all such patients were identified in three general practices in north west London. The practice records of these patients were examined to determine which patients had heart failure. Of the 30 204 patients served by the practices, 117 had heart failure, a prevalence of 3.9 per 1000 patients. The mean age of these patients was 74 years. The prevalence of heart failure among patients under 65 years of age was 0.6 per 1000 patients rising to 27.7 per 1000 among those aged 65 years and over. The aetiology of heart failure was considered to be coronary heart disease for 32% of patients, valve disease for 19%, hypertension for 6%, cor pulmonale for 4% and congenital heart disease for 2%. The aetiology for the remaining 37% of patients was unknown. Most patients were referred to hospital and only 20% had been treated solely by the general practitioner. An electrocardiogram and chest radiograph had been obtained for over 80% of patients but only 28% had an echocardiogram.*

Heart failure occurs primarily in elderly patients, and coronary heart disease is the dominant aetiological factor.

Keywords: *heart failure; morbidity; aetiology; epidemiology.*

Introduction

ALTHOUGH clinicians working in hospitals are conscious of the importance of patients with heart failure in clinical practice, it is surprising that there is little recent information regarding the prevalence of heart failure in the community. A review of the literature yields information on prevalence which is over 25 years old and concerns a population in two rural communities in the United States of America.¹ Also from the USA, the incidence of heart failure over a 20 year period in Framingham, Massachusetts, has been extrapolated to give a prevalence of 1%.^{2,3} In the United Kingdom the only available information on the prevalence of heart failure comes from the morbidity surveys in general practice in 1955–56 and 1981–82.^{4,5} These suggest that the prevalence is increasing. There are likely to be considerable differences in the prevalence of heart

failure in different countries and at different times. In addition, the technique used to sample the population as well as the criteria used to diagnose heart failure will influence the figures obtained.

This study set out to establish the prevalence of heart failure in three general practices in north west London in 1988. As population surveys are complex and expensive, a method based on the analysis of prescriptions noted in general practice records was used. Analysis of prescriptions has previously been shown to be a useful method of establishing the prevalence of angina.⁶ Additionally, it was decided to examine current practices in determining the aetiology of heart failure, and to determine the proportion of cases which had a particular aetiology.

Method

In this study it was assumed that any patients with heart failure would be prescribed a diuretic drug and would be maintained on such treatment by his or her general practitioner. In the study areas, patients receive prescriptions for drugs from hospitals for no more than two weeks at a time and have to visit their general practitioner for repeat prescriptions.

Practice A is in Uxbridge, Middlesex and had a record of all patients who were receiving diuretic drugs on index cards. Practice B is in Perivale, Middlesex and practice C is in Wembley and Willesden, north west London. Neither practice B or C had a separate record system for diuretic medication but neither prescribe diuretic drugs for more than four weeks at a time. In practices B and C details of all prescriptions issued for diuretic drugs over a three month period in the first half of 1988 were recorded prospectively in an attempt to identify all patients receiving diuretic medication in the practices. The data were collected by a doctor in each practice with the help of the receptionists and secretaries.

The practice records (including letters and discharge summaries from hospitals) of all patients receiving diuretic medication in the three practices were then examined to determine which patients had heart failure. A patient was considered to have heart failure if one of the following criteria was present: pulmonary oedema confirmed radiologically; peripheral oedema and a raised jugular venous pressure on clinical examination; evidence of heart disease (clinical, electrocardiographic or echocardiographic) where symptoms of dyspnoea improved on taking diuretic drugs and relapsed on discontinuing treatment. Relevant investigations, in particular, electrocardiography, chest x-ray and echocardiography were noted for all patients.

An assessment of the aetiology of heart failure was made for patients in practices A and B. The criteria used to establish coronary heart disease as the aetiology of heart failure were a documented myocardial infarction, a history of angina, or demonstration of coronary artery narrowing by coronary angiography. A hypertensive aetiology was based on a diagnosis of hypertension (a blood pressure above 160/95 mmHg) at any time in the practice records. The diagnoses of valve disease or congenital heart disease recorded in the notes were made clinically, usually by echocardiography, while a diagnosis of cor pulmonale was based on a history of lung disease with typical clinical and investigatory features. The aetiology of heart failure in patients who had fulfilled none of these criteria was classified as unknown.

J Parameswar, MRCP, registrar in cardiology and P A Poole-Wilson, MD, FRCP, professor of cardiology, The National Heart and Lung Institute, London. M M Shackell, MRCP, general practitioner, Perivale. A Richardson, MRCP, MRCP, general practitioner, Willesden. G C Sutton, MD, FRCP, consultant cardiologist, Hillingdon Hospital, Uxbridge. Submitted: 21 August 1991; accepted: 2 December 1991.

In addition, an analysis of the indications for all prescribing of diuretic medication was carried out for patients in practices A and B.

Results

A total of 30 204 patients were served by the three practices. The number of patients in each practice was approximately the same (Table 1). The age distribution of the patients in the three practices is shown in Table 1. A total of 117 patients (46 male and 71 female) fulfilled the criteria for the diagnosis of heart failure, giving an overall prevalence of 3.9 per 1000 patients. The mean age of the patients with heart failure was 73.7 years (standard deviation 12.2 years, range 5–99 years). The prevalence of heart failure among patients aged under 65 years was 0.6 per 1000 patients but for patients aged 65 years and over the prevalence was 27.7 per 1000 patients.

Of the 117 patients with heart failure only 23 (19.7%) had been managed exclusively by the general practitioner. A chest radiograph had been performed in 102 patients (87.2%) and an electrocardiogram in 104 (88.9%). Documentation of cardiac abnormalities and notably left ventricular dysfunction was present for only a minority of patients — 33 patients (28.2%) had a cardiac abnormality revealed by echocardiography and four (3.4%) had contrast ventriculography at cardiac catheterization.

In addition to diuretic drugs 12 of the 117 patients with heart failure (10.3%) were taking an angiotensin-converting enzyme inhibitor. Digoxin was being taken by 17 patients (14.5%); all but two of these patients were suffering from atrial fibrillation. Digoxin had continued to be prescribed after cardiac surgery for one of the latter two patients.

The aetiology of heart failure was determined for the 85 patients with heart failure in practices A and B. The most frequent aetiology was coronary heart disease (27 patients, 31.8%) followed by valve disease (16, 18.8%). Hypertension was uncommon (five patients, 5.9%) as were cor pulmonale (three, 3.5%) and congenital heart disease (two, 2.4%). In the remaining 32 patients (37.6%) the aetiology was classified as unknown. These 32 patients had a mean age of 81.2 years (standard deviation 8.5 years, range 65–99 years).

Analysis of indications for diuretic therapy, carried out in practices A and B, showed that most diuretic drugs were prescribed for hypertension and heart failure (Table 2).

Discussion

The purpose of this study was to estimate the prevalence and aetiology of heart failure in the north west London area. Given that new treatments for heart failure offer improvement both in the quality of life and in prognosis⁷⁻¹⁰ it is surprising that there is so little information on the prevalence of the condition.

In this study it was assumed that all patients who had heart failure were being prescribed a diuretic drug. This assumption seems reasonable as, in our experience of practice in the study area, if heart failure is recognized, a diuretic drug is used as first line therapy and patients with heart failure are never treated with digitalis or angiotensin-converting enzyme inhibitors without concomitant diuretic drugs. The use of other drugs as adjuncts to diuretic medication was uncommon in this study.

The definition of heart failure has always been controversial,¹¹ but for the purposes of this study a clinical definition was adopted. Thus, according to this definition patients who have left ventricular dysfunction without any symptoms do not have heart failure. Support for such a differentiation between patients with left ventricular dysfunction and heart failure is provided by the use of similar subsets in the studies of left ventricular dysfunction (SOLVD).¹²

Table 1. Age distribution of practice populations and of patients with heart failure.

	Practice A	Practice B	Practice C	Total
<i>No. of patients in practice</i>				
Total	10 232	9081	10 891	30 204
<i>Aged:</i>				
<65 years	8885	7847	9822	26 554
65+ years	1347	1234	1069	3650
<i>No. of patients with heart failure (per 1000 patients)</i>				
Total	51 (5.0)	34 (3.7)	32 (2.9)	117 (3.9)
<i>Aged:</i>				
<65 years	6 (0.7)	6 (0.8)	4 (0.4)	16 (0.6)
65+ years	45 (33.4)	28 (22.7)	28 (26.2)	101 (27.7)

Table 2. Indications for diuretic therapy in practices A and B.

Indication	% of patients	
	Practice A (n = 377) ^a	Practice B (n = 90)
Hypertension	68.7	45.6
Heart failure	13.5	37.8
Oedema	11.1	7.8
Other	6.6	8.9

n = total number of patients receiving diuretic therapy. ^aIncludes diuretic/beta-blocker combinations.

A genuine underestimate of the prevalence of heart failure would result if patients with the condition had not sought medical advice. However, as the condition produces symptoms the number of such patients is likely to be small. Another possibility which would result in an underestimate is that the patient with heart failure does not receive diuretic drugs from the general practitioner. Again this is unlikely as hospitals in this area do not prescribe drugs for longer than two weeks. It is more likely that the results presented here are an overestimate of the number of patients with heart failure: it is never easy to make clinical judgements by reading case notes and letters retrospectively, and we deliberately erred in favour of a positive diagnosis when there was real doubt.

The problems of deriving epidemiological data from drug prescribing in general practice were exemplified in this study. Only practice A used an index card system for drug prescribing and it is possible that not all patients in practices B and C who were taking diuretic drugs were identified. Certainly there was a striking difference in the number of patients taking diuretic drugs in practices A and B (377 versus 90). However, much of this difference could be attributed to the fact that the index card system yielded patients taking diuretic/beta-blocker combinations, usually prescribed for hypertension rather than heart failure whereas such combinations were omitted when searching the practice records in practice B. In addition, the level of blood pressure at which doctors initiate drug therapy and whether or not they prescribe diuretic medication in the first or subsequent instances varies widely. Nevertheless, practice A yielded a prevalence of heart failure of 5.0 per 1000 patients, and practices B and C 3.7 and 2.9 per 1000 patients, respectively.

In 1962–63 Gibson and colleagues found the prevalence of heart failure in the white population in two rural communities

in the USA to be 10 per 1000 patients and in those over 65 years of age, 60 per 1000.¹ However, they made no attempt to define heart failure. In the UK the prevalence of heart failure in the first morbidity survey in general practice, carried out in 1955–56, was 3 per 1000 patients.⁴ However, in that study patients considered to have hypertensive heart disease, chronic rheumatic heart disease, 'myocardial degeneration' and coronary heart disease were classified separately and could also have had heart failure. The third morbidity survey, carried out in 1981–82, which made the same distinction found that the prevalence of heart failure had increased to 10 per 1000 patients.⁵ In these studies no attempt was made to investigate the diagnostic criteria used by the participating general practitioners or to validate the diagnoses. A recent study of the validity of the clinical diagnosis of heart failure in primary care reported a false positive rate of at least 34%.¹³

The Framingham study, the most commonly quoted reference for the prevalence of heart failure, describes the development of heart failure in 219 patients aged 45–74 years over a 20 year period taken from an initial sample of 5192 individuals.² Using these incidence figures, the prevalence of heart failure has been estimated as 10 per 1000 patients in this age group.³ This figure cannot be compared directly with the results of our study because the Framingham study is longitudinal and our study was cross-sectional. It is also important to remember that the results of our study relate to all age groups while the Framingham figures are for a specific age group.

This study also attempted to assess the aetiology of heart failure in this part of London. Many cardiologists believe that as the diagnosis of heart failure is based on the existence of heart disease, the nature of the heart disease would be established in every case. In practice this is not the case, and the largest group of patients in this series (38%) did not have an aetiology established. This cannot be attributed to the general practitioner, as most of these patients had been referred to hospitals and letters and discharge summaries from hospitals were examined as part of the study.

At a time when a plethora of non-invasive investigations for cardiac abnormalities are available, it was surprising that these are used in only a minority of patients. Echocardiography is available in virtually all hospitals and whereas most cardiologists would carry out echocardiography in all patients, irrespective of age in whom a diagnosis of heart failure has been made, this is not the case with general physicians, geriatricians or general practitioners who do not have direct access to the investigation. Yet it is the latter groups who look after most patients with heart failure, particularly as most of them are elderly. Whether demonstration of a cardiac abnormality by echocardiography would alter the outcome in patients has not been established, but as a simple non-invasive test which might reveal a surprise abnormality, it seems a sensible test for the clinician to do.

Not surprisingly, coronary heart disease was the most common aetiology for this group of patients with heart failure. It is also likely that the majority of the patients whose aetiology was 'unknown' were also cases of coronary heart disease leading to heart failure.

The rarity of hypertension as an aetiological factor does not come as a surprise to hospital clinicians who deal with large numbers of patients with heart failure. It is unlikely that general practitioners would fail to measure the blood pressure of patients with cardiovascular symptoms. Yet traditionally, hypertension has been quoted as a common cause of heart failure — hypertension preceded the onset of heart failure in 75% of patients in the Framingham study.² There are various possible explanations for such a major difference. The Framingham study began in 1949 and continued for 20 years: during this period

antihypertensive therapy was less effective and there was less awareness of the importance of hypertension. That hypertension has become better recognized is suggested by the morbidity surveys in general practice which show a marked increase in patient consulting rates for hypertension between 1955–56 (14.7 per 1000 patients) and 1981–82 (37.3 per 1000).^{4,5} Coronary heart disease commonly occurs with hypertension and therefore cases of heart failure which were previously diagnosed as caused by hypertension, may actually have been caused by coronary heart disease. A recent review of the aetiology of congestive heart failure found that coronary heart disease was the cause for over half the cases and hypertension was found in only 4%.¹⁴

Despite the shortcomings discussed above, the findings presented here provide preliminary information on the prevalence and aetiology of heart failure in north west London in the late 1980s. The data show that heart failure is predominantly a disease of elderly people and the most frequent cause is coronary heart disease. Comparative information is required for other regions in order to establish the allocation of resources for the management of heart failure.

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Address for correspondence

G C Sutton, Hillingdon Hospital, Uxbridge, Middlesex UB8 3NN.