Co-existing conditions and utilisation of health services associated with heart failure: general-practice-based study

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This paper examines conditions that occur with heart failure and the associated use of health services among patients with heart failure by demographic and socio-economic characteristics. The data come from the Fourth National Survey of Morbidity in General Practice in England and Wales, carried out in 1991 to 1992. The prevalence of patients consulting with heart failure during that year was 8.3 per 1,000 patients. The risk of co-existing disease was higher among heart failure patients than patients without heart failure. Patients with heart failure more frequently consulted their general practitioner, required a home visit and needed referral to secondary care than patients without heart failure, irrespective of age, sex or social class. These findings suggest that higher levels of morbidity among heart failure patients lead to substantially higher utilisation of services in general practice.

Introduction

Heart failure comprises a syndrome of clinical symptoms including shortness of breath, general tiredness and swelling of the feet and ankles. The main cause of heart failure is coronary heart disease; other causes include hypertension, cardiomyopathy and arrhythmias. The mortality rate from heart failure is similar to many common forms of cancer.[1] Heart failure causes high levels of morbidity as reflected in the high hospital admission rates and greater disability than conditions such as diabetes.[2,3] Heart failure is a serious public health problem and is one of a number of cardiovascular conditions included in the National Service Framework (NSF) for Coronary Heart Disease (CHD) for England.[4] The NSF establishes standards in undertaking key investigations for patients suspected with heart failure such as echocardiography and in providing appropriate treatment with drugs such as angiotensin-converting enzyme (ACE) inhibitors. Primary care teams will play a major role in implementing many of these standards.

As the population of England and Wales ages the overall prevalence of heart failure is likely to increase. Older age is associated with an increase in the prevalence of heart failure; the median age of clinical presentation is 76 years.[4,5] Older age also increases the risk of co-existing conditions. Some information on the co-morbidity associated with heart failure is available from clinical trials. However, patients recruited to these trials are not representative of the general population of heart failure patients and these trials selectively recruit patients to simplify the interpretation of results. Hence, there is relatively little information on the extent of co-morbidity among heart failure patients in the general population.

A large proportion of hospital admissions and deaths due to heart failure has been shown to be associated with conditions other than heart failure.[6] Therefore, to reduce the overall risk of hospital admission among heart failure patients co-existing disorders also need to be treated. Primary care plays a key role as most patients with heart failure are managed by general practitioners. However, there are no studies to our knowledge that have examined the impact of heart failure patients on general practice workload.

Our analysis uses data from the Fourth National Survey of Morbidity in General Practice (MSGP4). The objectives of our study were to determine the prevalence of heart failure among patients in the survey, the co-morbidity associated with heart failure and the pattern of use of general practice services.

Methods

The MSGP4 carried out in 1991 to 1992 was a one year prospective cohort study of 502,482 patients registered with 60 volunteer general practices in England and Wales. This survey examined conditions seen in general practice in the 12 month period. Details of patient's conditions presented to their GP before or after this period were not recorded. The main objective of the survey was to examine the pattern of disease and the care provided in general practice by the age, sex, and socio-economic status of patients. The study covered a 1 per cent sample of the population of England and Wales which was representative of characteristics such as age, sex, marital status and social class (Box 1). There was some under-representation of minority ethnic groups and people living alone, probably due to a smaller number of participating practices from inner cities.

Box one

Definitions of social class groups

I	Professional and higher managerial
II	Managerial
IIIN	Skilled (non-manual)
IIIM	Skilled (manual)
IV	Partly skilled
V	Unskilled

Recording of data

Before the survey started, doctors and practice nurses from each practice attended three two-day training sessions on the recording of morbidity data. Data were then collected for two to four weeks, analysed and any errors or inconsistencies reported to the individual practices. Once the morbidity survey started general practitioners and practice nurses recorded information on all face to face contacts with patients. The date, place of contact, reason for each consultation, consultation types and referral types, the latter when appropriate was directly entered onto patient records on the practice computer. Each consultation was given a diagnostic Read code.[7] The items of information were then transferred on disk to the Office of Population Censuses and Surveys (now the Office for National Statistics) where each diagnosis was assigned an International Classification of Diseases Ninth Revision (ICD9) code.[8] Socio-economic data such as occupation, employment and housing tenure were recorded for each patient.

Validation of data

At the end of the survey, the data from 28,000 manual practice records of patients that were seen either in a surgery or elsewhere on four different days by the 60 practices were compared with data on the computer records. In the data submitted by practices 96 per cent of face to face contacts in the surgery and 95 per cent of those at home had been recorded. The diagnostic data in a random sample of 999 patients showed that 93 per cent of diagnoses were correctly recorded. Each item of socio-economic data was checked to ensure coding was within the defined criteria. For example, standard coding lists were supplied by the OPCS for assigning occupation codes to patients. The codes assigned were checked against the original list to ensure they were compatible. Data recorded outside the 12 month period were not validated.

Case and rate definition

The definition of prevalence adopted in our study was the number of patients with a first, new or ongoing consultation for heart failure (ICD 9 code 428) during the 12 month study period (Box 2). Firstly, we examined the prevalence of heart failure by age and sex. We also calculated rate ratios with 95 per cent confidence intervals for patients consulting under selected ICD 9 disease chapters and age-sex specific and age-sex standardised risk ratios for cardiovascular and diabetes co-morbidity among patients with and without heart failure. Rate ratios with 95% confidence intervals by age, sex and social class for measures of health service use (general practice consultations, home visits and secondary care referrals) were calculated using a generalised linear model with a Poisson error and log link.[9] Secondary care referrals included inpatient, outpatient and accident and emergency referrals.

Box two

Consultation Types

Every consultation (each diagnosis during or reason for a contact) was recorded as **first, new** or **ongoing** and defined as the following:

- **First** for illness or a condition for which the patient had never previously consulted,
- **New** for illness or a condition for which the patient had previously but not recently consulted,
- **Ongoing** for a consultation for a continuing illness that follows a first or new consultation.

Results

The crude prevalence of patients consulting with heart failure at least once in the study year 1991 to 1992 was 8.3 per 1000 patients. The figure was higher in women (9.4 per 1,000 patients) than in men (7.2 per 1,000 patients) and increased with age especially among those aged 75 years and over (Table 1). The prevalence rate in men aged 75 years and over was 85.6 per 1000 patients and in women was 81.1 per 1,000 patients. We restricted all subsequent analyses to patients aged 45 years and over as 99 per cent of cases of heart failure occurred in this age group.

Table 1 **Age and sex specific prevalence of heart failure per 1,000 patients in England and Wales, 1991–92**

	Men			Women		
	Number of heart failure cases	Total sample population	Rate per 1,000 (95% CI)	Number of heart failure cases	Total sample population	Rate per 1,000 (95% CI)
Age group (years)						
45–64	233	51,679	4.5 (3.9 - 5.1)	185	50,647	3.7 (3.1 - 4.2)
65–74	553	17,801	31.0 (28.6 - 33.7)	491	21,785	22.5 (20.6 - 24.6)
75 and over	963	11,253	85.6 (80.5 - 90.8)	1,715	21,145	81.1 (77.5 - 84.9)
45 and over	1,749	80,733	21.7 (20.7 - 22.7)	2,391	93,577	25.6 (24.5 -26.6)
All ages	1,762	245,600	7.2 (6.8 - 7.5)	2,404	256,882	9.4 (9.0 - 9.7)

CI denotes confidence interval.

Co-morbidity

A higher percentage of patients with heart failure consulted for other diseases than patients without heart failure (Table 2). The largest relative increases in consultation rates were seen for circulatory, haematological and endocrine disorders. The age-standardised risk of diabetes or cardiovascular co-morbidity was also higher among patients with heart failure for all the listed conditions except for hypertension (Tables 3 and 4). The age-specific co-morbidity risk ratios decreased with increasing age and are largely accounted for by a decrease between the 45–64 and 65–74 age group. The age-standardised co-morbidity risk ratio for men was highest for atrial fibrillation (risk ratio=6.68). This risk ratio means that men with heart failure were more than six times as likely as men without heart failure to consult for atrial fibrillation. The age-standardised co-morbidity risk ratio for men was also high for ischaemic heart disease (risk ratio=3.69), diabetes (risk ratio=1.98) but not for hypertension (risk ratio=0.98). The pattern of risk was similar for women, (atrial fibrillation 6.91, ischaemic heart disease 3.61, diabetes 2.30 and hypertension 0.78).

Utilisation of health services

Patients with heart failure have higher general practice consultation rates than patients without heart failure, rate ratio=2.57 (Table 5). Men with heart failure had similar mean number of general practice consultations as women but among patients without heart failure men had fewer consultations compared with women. Among heart failure patients increasing age was associated with fewer consultations. The opposite was seen among non heart failure patients where increasing age was associated with a higher mean number of consultations. Among heart failure patients, low social class was not associated with an increased number of consultations. In contrast, patients without the disease and in Social Classes IV and V had a higher number of consultations than patients in Social Classes I and II. Consultation rate ratios among heart failure versus non heart failure patients decreased with social class and the ratio was 1.5 times higher in Social Class I compared to Social Class V.

Table 2 **Patients consulting, by ICD 9 disease chapters, in England and Wales, 1991–92**

ICD 9 Chapter		Heart failure patients (%)	Non heart failure patients (%)	Rate ratio (95% CI)
I	Infectious and Parasitic Diseases	52.8	38.5	1.37 (1.33 - 1.41)
II	Neoplasms	5.5	2.2	2.50 (2.21 - 2.85)
III	Endocrine, Nutritional and Metabolic Diseases, and Immunity Disorders	15.0	3.4	4.40 (4.08 - 4.74)
IV	Diseases of the Blood and Blood-forming Organs	2.3	0.4	5.54 (4.52 - 6.78)
V	Mental Disorders	16.5	6.7	2.46 (2.30 - 2.64)
VI	Diseases of the Nervous System and Sense Organs	25.1	16.1	1.56 (1.48 - 1.64)
VII	Diseases of the Circulatory System*	48.0	7.9	6.07 (5.88 - 6.28)
VIII	Diseases of the Respiratory System	50.1	27.0	1.86 (1.80 - 1.92)
IX	Diseases of the Digestive System	22.5	7.9	2.83 (2.67 - 2.99)
X	Diseases of the Genitourinary System	13.0	10.5	1.24 (1.14 - 1.33)
XII	Diseases of the Skin and Subcutaneous Tissue	19.2	13.5	1.41 (1.31 - 1.53)
XIII	Diseases of the Musculoskeletal System and Connective Tissue	34.0	14.0	2.43 (2.33 - 2.53)
XVII	Injury and Poisoning	19.9	12.9	1.54 (1.45 - 1.64)

CI denotes confidence interval.
*Excludes consultations for heart failure.
Excluded chapters
XI Complications of Pregnancy, Childbirth, and the Puerperium
XIV Congenital Anomalies
XV Certain conditions originating in the Perinatal period
XVI Symptoms, Signs and Ill-defined Conditions

Table 3 **Cardiovascular and diabetes co-morbidity in men aged 45 years and over with and without heart failure in England and Wales, 1991–92**

	Heart failure patients (%)	Non heart failure patients (%)	Age-specific risk ratio			Age-standardised risk ratio (95% CI)
			45–64	65–74	75 and over	
Ischaemic heart disease	26.30	5.14	10.92	3.82	2.74	3.69 (3.38 - 4.04)
Atrial fibrillation	8.46	0.63	35.33	8.63	4.74	6.68 (5.51 - 8.08)
Hypertension	10.58	9.16	1.75	0.94	0.88	0.98 (0.85 - 1.13)
Diabetes mellitus	7.38	2.73	4.99	1.94	1.63	1.98 (1.66 - 2.37)
Stroke	4.17	1.03	6.18	2.48	1.61	1.95 (1.53 - 2.48)
Transient ischaemic attack	3.43	0.74	1.82	3.56	1.44	1.85 (1.42 - 2.42)

CI denotes confidence interval.

Table 4 **Cardiovascular and diabetes co-morbidity in women aged 45 years and over with and without heart failure in England and Wales, 1991–92**

	Heart failure patients (%)	Non heart failure patients (%)	Age-specific risk ratio			Age-standardised risk ratio (95% CI)
			45–64	65–74	75 and over	
Ischaemic heart disease	17.40	3.07	15.62	4.21	3.06	3.61 (3.27 - 3.99)
Atrial fibrillation	9.24	0.60	43.07	11.55	5.97	6.91 (5.89 - 8.10)
Hypertension	10.58	11.43	1.23	0.96	0.68	0.78 (0.69 - 0.88)
Diabetes mellitus	6.57	2.17	6.67	2.38	2.04	2.30 (1.96 - 2.71)
Stroke	4.10	0.92	10.82	4.25	1.62	1.95 (1.58 - 2.40)
Transient ischaemic attack	2.93	0.72	0	3.27	1.67	1.80 (1.41 - 2.31)

CI denotes confidence interval.

Table 5 **Mean annual number of consultations per person in patients with and without heart failure, by sex, age and social class, England and Wales, 1991–92**

	Men			Women			Persons		
	Heart failure patients	Non heart failure patients	Consultation rate ratio (95% CI)	Heart failure patients	Non heart failure patients	Consultation rate ratio (95% CI)	Heart failure patients	Non heart failure patients	Consultation rate ratio (95% CI)
Age group									
45–64	13.05	3.39	3.85 (3.72 - 3.99)	13.54	4.88	2.78 (2.67 - 2.89)	13.27	4.12	3.22 (3.13 - 3.30)
65–74	12.35	4.60	2.69 (2.62 - 2.75)	12.54	5.25	2.39 (2.33 - 2.45)	12.44	4.96	2.51 (2.47 - 2.55)
75 and over	10.92	5.15	2.12 (2.08 - 2.17)	11.14	5.39	2.07 (2.03 - 2.10)	11.06	5.31	2.08 (2.06 - 2.11)
All ages	11.66	3.88	3.00 (2.96 - 3.05)	11.61	5.07	2.29 (2.26 - 2.32)	11.63	4.52	2.57 (2.55 - 2.60)
Social Class									
I	12.49	3.42	3.66 (3.43 - 3.91)	13.81	4.43	3.12 (2.85 - 3.41)	12.92	3.88	3.33 (3.16 - 3.51)
II	11.83	3.84	3.08 (2.98 - 3.19)	13.30	5.06	2.63 (2.54 - 2.71)	12.55	4.48	2.80 (2.74 - 2.87)
IIIN	11.83	4.32	2.74 (2.61 - 2.88)	12.02	5.48	2.19 (2.12 - 2.27)	11.96	5.08	2.35 (2.29 - 2.42)
IIIM	11.99	4.65	2.58 (2.52 - 2.64)	11.77	5.72	2.06 (2.00 - 2.12)	11.90	5.15	2.31 (2.27 - 2.36)
IV	12.09	4.77	2.53 (2.45 - 2.62)	12.45	5.96	2.09 (2.02 - 2.15)	12.29	5.42	2.27 (2.22 - 2.32)
V	13.25	4.94	2.68 (2.52 - 2.85)	12.04	6.17	1.95 (1.88 - 2.03)	12.35	5.70	2.17 (2.10 - 2.24)

CI denotes confidence interval.

Among patients with and without heart failure, the mean annual number of home visits increased with age (Table 6). Patients with heart failure had a higher mean number of home visits than patients without the disease (rate ratio=8.59) and irrespective of age, women with heart failure had a higher number than men with the disease. The rate ratio of the mean number of home visits for heart failure versus non heart failure patients was higher for men than for women and higher in the younger age than the older age group. The home visiting rate ratio among heart failure versus non heart failure patients in Social Class I was three times higher than in Social Class V.

Patients with heart failure had higher rates of referral to secondary care compared to patients without heart failure, rate ratio=2.96 (Table 7). Among heart failure patients, increasing age was not associated with a higher mean number of referrals. In contrast, older patients without the disease had a higher number of referrals than younger patients. Among patients with heart failure there was a graded association between the mean number of referrals and social class; Social Class I patients (mean=0.62) had a higher mean number of referrals than Social Class V (mean=0.42). However, among patients without heart failure there were similar mean numbers of referrals across the social classes. The referral rate ratio of patients was 1.5 times higher in Social Class I compared to Social Class V.

Table 6 **Mean annual number of home visits per person in patients with and without heart failure, by sex, age and social class, England and Wales, 1991–92**

	Men			Women			Persons		
	Heart failure patients	Non heart failure patients	Home visit rate ratio (95% CI)	Heart failure patients	Non heart failure patients	Home visit rate ratio (95% CI)	Heart failure patients	Non heart failure patients	Home visit rate ratio (95% CI)
Age group									
45–64	1.74	0.13	13.81 (12.49 - 15.27)	2.08	0.19	11.03 (9.97 - 12.22)	1.89	0.16	12.04 (11.21 - 12.93)
65–74	2.67	0.42	6.32 (5.97 - 6.68)	3.22	0.53	6.03 (5.72 - 6.36)	2.93	0.48	6.05 (5.82 - 6.29)
75 and over	4.25	1.24	3.42 (3.30 - 3.55)	5.05	1.65	3.06 (2.99 - 3.14)	4.76	1.51	3.16 (3.10 - 3.22)
All ages	3.41	0.34	10.17 (9.89 - 10.46)	4.44	0.58	7.66 (7.50 - 7.82)	4.01	0.47	8.59 (8.45 - 8.73)
Social Class									
I	4.09	0.20	20.45 (18.02 - 23.20)	4.00	0.23	17.52 (14.72 - 20.85)	4.06	0.21	19.07 (17.23 - 21.11)
II	3.29	0.25	13.28 (12.39 - 14.24)	4.45	0.39	11.36 (10.70 - 12.06)	3.86	0.32	11.95 (11.42 - 12.50)
IIIN	3.15	0.33	9.40 (8.44 - 10.41)	4.08	0.57	7.14 (6.73 - 7.59)	3.78	0.49	7.72 (7.33 - 8.13)
IIIM	3.34	0.37	9.06 (8.63 - 9.51)	3.58	0.46	7.79 (7.37 - 8.23)	3.44	0.41	8.36 (8.06 - 8.67)
IV	3.39	0.44	7.67 (7.15 - 8.23)	4.29	0.62	6.97 (6.59 - 7.37)	3.89	0.54	7.25 (6.94 - 7.57)
V	3.46	0.47	7.43 (6.55 - 8.41)	4.34	0.85	5.11 (4.78 - 5.47)	4.12	0.70	5.86 (5.52 - 6.21)

CI denotes confidence interval.

Table 7 **Mean annual number of referrals to secondary care per person in patients with and without heart failure, by sex, age and social class, England and Wales, 1991–92**

	Men			Women			Persons		
	Heart failure patients	Non heart failure patients	Referral to secondary care rate ratio (95% CI)	Heart failure patients	Non heart failure patients	Referral to secondary care rate ratio (95% CI)	Heart failure patients	Non heart failure patients	Referral to secondary care rate ratio (95% CI)
Age group									
45–64	0.48	0.13	3.65 (3.03 - 4.40)	0.51	0.16	3.22 (2.63 - 3.94)	0.50	0.15	3.40 (2.97 - 3.90)
65–74	0.55	0.18	3.00 (2.67 - 3.38)	0.45	0.18	2.51 (2.19 - 2.87)	0.50	0.18	2.77 (2.54 - 3.03)
75 and over	0.52	0.25	2.07 (1.88 - 2.28)	0.49	0.22	2.20 (2.05 - 2.37)	0.50	0.23	2.15 (2.03 - 2.28)
All ages	0.52	0.16	3.31 (3.09 - 3.54)	0.48	0.18	2.71 (2.55 - 2.88)	0.50	0.17	2.96 (2.83 - 3.09)
Social Class									
I	0.65	0.17	3.90 (2.92 - 5.19)	0.56	0.18	3.10 (1.99 - 4.84)	0.62	0.17	3.60 (2.83 - 4.58)
II	0.61	0.18	3.39 (2.92 - 3.93)	0.61	0.19	3.16 (2.71 - 3.67)	0.61	0.19	3.26 (2.93 - 3.63)
IIIN	0.44	0.17	2.63 (2.04 - 3.38)	0.48	0.21	2.31 (1.95 - 2.72)	0.47	0.19	2.41 (2.09 - 2.77)
IIIM	0.53	0.18	2.99 (2.67 - 3.36)	0.48	0.18	2.70 (2.33 - 3.12)	0.51	0.18	2.87 (2.63 - 3.14)
IV	0.45	0.18	2.48 (2.07 - 2.97)	0.42	0.19	2.24 (1.89 - 2.64)	0.43	0.19	2.34 (2.07 - 2.65)
V	0.44	0.17	2.56 (1.83 - 3.56)	0.41	0.18	2.23 (1.81 - 2.73)	0.42	0.18	2.33 (1.95 - 2.77)

CI denotes confidence interval.

Discussion

Main findings

The overall crude prevalence of patients consulting for heart failure in this population-based study during 1991 to 1992 was 8.3 per 1,000 patients. Patients with heart failure have an increased risk of co-existing disease. The age-specific relative risk ratios for heart failure co-morbidity decrease with increasing age against a background of increased co-existing conditions in other patients. We found that heart failure patients were more likely to have ischaemic heart disease, atrial fibrillation and diabetes compared to patients without the disease. However, they were not at increased risk of hypertension. Chronic conditions diagnosed many years earlier may not be recorded in the one year study period. This may explain the low relative risk of heart failure versus non heart failure patients with recorded hypertension as a co-existing condition. There are two possible explanations for this result. Firstly, among heart failure patients the diagnosis of hypertension preceded the diagnosis of heart failure. Thus, hypertension was recorded before the study period but was not recorded alongside heart failure during the study despite co-existing hypertension. It may be that heart failure is now seen as the primary treatment focus, which includes regular recording of blood pressure. Secondly, heart failure patients with a previous diagnosis of hypertension may no longer have hypertension as it is controlled as part of their heart failure management.[10,11]

Heart failure patients utilise primary care services more frequently than non heart failure patients. They consult their general practitioner, require a home visit and are referred to secondary care more frequently than patients without heart failure irrespective of their age, sex or social class. We also observed age, sex and social class differences between heart failure and non heart failure patients. Older patients, women and patients from lower social classes consulted their general practitioner less frequently, had fewer home visits and lower rates of referral to secondary care. These differences may reflect inequities in use of health care among these groups. Heart failure patients in Social Class I utilise services more frequently than Social Class V (higher levels of home visits and referrals to secondary care) but among patients without heart failure the reverse trend is seen. However, these rates of utilisation of services by social class are not age-standardised. This means that these rates may be affected by different age structures in the different social classes. The results for heart failure patients are in contrast to other findings where patients from lower social classes use services more; relating to the greater levels of need among this group. This suggests that heart failure patients from lower social classes may be under using primary care services. This has important implications for these groups of patients, as they may then also be less likely to be referred for specialist care.

Strengths and weaknesses of study: comparison with other studies

The MSGP4 is a large study with an unselected sample of 500,000 patients, and therefore of a sufficient size to detect differences in co-morbidity and patterns of service use among patients with and without heart failure. Other strengths of the survey include a study population that was representative of England and Wales for age, sex and socio-economic factors. Furthermore, data were collected prospectively and validation studies suggest that data recording was good.[12]

The prevalence of heart failure found in this study in 1991 to 1992 is consistent with other population-based studies which have reported prevalence figures ranging between 0.4 and 1.5 per cent.[5,13,14,15,16,17] The methods of ascertaining cases including case definition and sampling method have differed between these studies. Previous prevalence studies in the United Kingdom have involved smaller samples and may not have been representative of the population. Some studies report an increased prevalence of heart failure during the 1990s. This may explain why the prevalence of the disease found in this 1991 to 1992 study is in the middle of the 0.4 to 1.5 per cent range.

There have been to our knowledge no reported studies, which have examined the general practice workload associated with heart failure patients. We have found no large-scale studies carried out in primary care that have investigated heart failure co-morbidity. A few small studies have reported on the co-morbid conditions associated with heart failure patients. The MSGP4 survey was carried out over one year; this is an insufficient period of time to examine the role of these co-morbid conditions in the aetiology of heart failure. Furthermore, general practitioners only recorded the diagnoses that patients presented with during the 12 months of the study. Hence, not all co-existing conditions will have been identified.

This study was limited to identifying patients who consulted for heart failure. Patients with heart failure not treated by their general practitioner and those with asymptomatic left ventricular dysfunction were not ascertained. In a recent study, half of all patients diagnosed with left ventricular dysfunction had no symptoms.[18] However, it is likely that patients with a clinical diagnosis of heart failure would have at least on one occasion consulted their general practitioner throughout the year and thus will have been included in this study. Patients newly diagnosed with heart failure in hospital, towards the end of the study period would not be included in our results because their initial management may have been carried out entirely in secondary care. Hence, these patients would not have consulted their general practitioner within the 12 month period. Furthermore, in this study we were not able to verify the accuracy of the clinical diagnosis of heart failure. There is evidence that only 50 per cent of patients being treated for heart failure have echocardiographic evidence of left ventricular systolic dysfunction.[19]

The secondary care referral data also needs to be interpreted with caution as evaluation exercises at the end of the survey suggested that 61 per cent of referrals to outpatient departments were reported.[12] This will reduce the reported referral rates, but is unlikely to influence our conclusions, as there is no reason to assume that the recording of referrals information varied between patients with and without heart failure. The generalisability of our findings may also be limited; the participating practices in the survey were volunteers with fewer practices from inner city areas. This probably resulted in an under representation in the study of unemployed patients and patients from minority ethnic groups.[12] Another limitation is that the survey data are 10 years old, although it is unlikely that the utilisation of services seen among heart failure patients has fallen.

Implications of study and future research

Our study shows that patients with heart failure have more contact with general practitioners and are more likely to be referred by them to secondary care than patients without heart failure. This utilisation of services would be expected to rise with the concomitant increase in the prevalence of heart failure due to the ageing population. The co-morbidity associated with heart failure may explain why there is greater use of services by heart failure patients. Studies show the increased rate of hospital admissions among patients with heart failure is a major contributor to health care costs.[20] Heart failure is amenable to treatment, there is good evidence from the first trial in 1989 demonstrating the effectiveness of therapeutic interventions such as ACE inhibitors and more recently beta-blockers and spironolactone in reducing mortality and hospital admissions.[21,22,23,24] Furthermore, patients with heart failure consult their general practitioner on average between 11 to 12 times a year, which offers numerous opportunities to improve the management of these patients in primary care.

Conclusions

We have identified heart failure patients as a group with higher levels of co-existing conditions and greater use of general practice services than patients without heart failure. The higher levels of co-morbidity may explain the increased demand for services among heart failure patients. This study emphasises the need to take account of the many other conditions present among patients with heart failure. Heart failure patients from lower social classes use primary care services less frequently, which points to under use among this group and possible under treatment. Guidelines indicate that the treatment of heart failure patients should include effective interventions such as ACE inhibitors as well as treatment of any concurrent conditions.[25] Primary care will play a major role in meeting these objectives. In our analysis of MSGP4 data we were unable to examine trends in health service utilisation by heart failure patients but we plan to do so in future work.

Key findings

- The crude prevalence of patients consulting with heart failure in the study year 1991–92 was higher for women (9.4 per 1,000 patients) than for men (7.2 per 1,000 patients).
- Patients with heart failure had an increased risk of co-existing disease and were more likely to consult for ischaemic heart disease, atrial fibrillation and diabetes than non heart failure patients. However, heart failure patients were not at increased risk of hypertension.
- Heart failure patients consult their general practitioner, require a home visit and are referred to secondary care more frequently than non-heart-failure patients.
- Heart failure patients in Social Class I (had more home visits and referrals to secondary care than heart failure patients in Social Class V. Among patients without heart failure the reverse trend was seen.

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