

Primary care

Influence of socioeconomic deprivation on the primary care burden and treatment of patients with a diagnosis of heart failure in general practice in Scotland: population based study

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BMJ 2004;328:1110-3

Abstract

Objectives To examine whether there are socioeconomic gradients in the incidence, prevalence, treatment, and follow up of patients with heart failure in primary care.

Design Population based study.

Setting 53 general practices (307 741 patients) participating in the Scottish continuous morbidity recording project between 1 April 1999 and 31 March 2000.

Participants 2186 adults with heart failure.

Main outcome measures Comorbid diagnoses, frequency of visits to general practitioner, and prescribed drugs.

Results 2186 patients with heart failure were seen (prevalence 7.1 per 1000 population, incidence 2.0 per 1000 population). The age and sex standardised incidence of heart failure increased with greater socioeconomic deprivation, from 1.8 per 1000 population in the most affluent stratum to 2.6 per 1000 population in the most deprived stratum (odds ratio 1.44, $P = 0.0003$). On average, patients were seen 2.4 times yearly, but follow up rates were less frequent with increasing socioeconomic deprivation (from 2.6 yearly in the most affluent subgroup to 2.0 yearly in the most deprived subgroup, $P = 0.00009$). Overall, 812 (80.6%) patients were prescribed diuretics, 396 (39.3%) angiotensin converting enzyme inhibitors, 216 (21.4%) β blockers, 208 (20.7%) digoxin, and 86 (8.5%) spironolactone. The wide discrepancies in prescribing between different general practices disappeared after adjustment for patient age and sex. Prescribing patterns did not vary by deprivation categories on univariate or multivariate analyses.

Conclusions Compared with affluent patients, socioeconomically deprived patients were 44% more likely to develop heart failure but 23% less likely to see their general practitioner on an ongoing basis. Prescribed treatment did not differ across socioeconomic gradients.

Introduction

Socioeconomic deprivation is associated with higher rates of admission to hospital and case fatality in heart failure, but the mechanisms are unclear.¹⁻³ It may be intriguing to speculate about socioeconomic gradients in access to general practitioners and outpatient pharmacotherapy being the key causative factors, but there is a paucity of high quality research on heart failure in primary care.⁴

We examined whether there are socioeconomic gradients in the incidence, prevalence, and follow up of patients with heart failure. We also examined the influence of socioeconomic deprivation on general practitioners' prescribing patterns.

Methods

In Scotland the continuous morbidity recording project involves the collection of prospective data from selected general practices. At the time of our study, these 53 practices had a registered population of 307 741 patients (around 6% of the Scottish population) and were representative of the Scottish population for age, sex, socioeconomic status, and mix of rural and urban locations.⁵ Comprehensive information is collected on the index condition (first occurrence, recurrent, or persistent), up to nine concomitant medical problems, and prescriptions.⁶ Data are entered on to the computer system of the general practice administration system for Scotland. In 1999-2000 the completeness of capture of contacts was 91% and the accuracy of Read coding was 91% (L Graham, personal communication, 29 November 2003).

Using data from 1 April 1999 to 31 March 2000, we examined the prevalence and contacts (number of consultations for that diagnosis in that year) for heart failure. We also estimated the incidence of heart failure from the number of patients with a diagnosis of heart failure entered by their general practitioner with the



This is the abridged version of an article that was posted on bmj.com on 23 April 2004: <http://bmj.com/cgi/doi/10.1136/bmj.38043.414074.EE>

modifier of "first." The table shows the crude rates and the age and sex standardised rates.

Prescription data were obtained from a representative subset (22 practices, 1007 patients with heart failure), and we included only drugs (loop diuretics, angiotensin converting enzyme inhibitors, β blockers, spironolactone, and digoxin) that had been prescribed at least twice during the study.

Using postcodes of residence, we assigned a Carstairs deprivation category, from 1 (most affluent) to 5 (most deprived), to 294 112 patients (95.6% of total cohort).⁷

We used general χ^2 tests and χ^2 tests for trend, as appropriate, to compare the prevalence and incidence of heart failure and contact rates and prescribing data between deprivation categories. Multivariate logistic regression was used to examine the independent effects of age, sex, deprivation category, and general practitioner on prescriptions for each drug for heart failure. Using the drug of interest as the independent variable in a binary logistic regression model, we used a backward stepwise selection, with age, deprivation category, and general practitioner as the independent variables.

Results

Of the 307 741 patients registered in the general practices participating in the Scottish continuous morbidity recording project, 2186 were seen at least once for heart failure between 1 April 1999 and 31 March 2000 (prevalence 7.1 per 1000 population). Of these patients, 609 (27.9%) had a first diagnosis of heart failure (incidence 2.0 per 1000 population). The 2186 patients were seen 5285 times over the year (17.2 contacts per 1000 population), with a mean 2.4 contacts per patient each year.

The prevalence of heart failure differed between deprivation categories (table), with a non-significant 13% trend towards higher age and sex standardised prevalence in the most deprived group. The incidence of heart failure significantly increased with increasing social deprivation: socioeconomically deprived patients were 44% more likely to develop heart failure than affluent patients. In contrast, patients in the most deprived group had 23% fewer follow up visits each year with their general practitioner (table). Although the age and sex standardised contacts differed significantly between the five strata, there was little difference between the four most affluent categories 1 to 4. However, the most deprived subgroup had significantly lower standardised

contact rates compared with deprivation categories 1 to 4. Contact rates did not differ across age groups or by sex. Estimated mean survival rates were significantly lower in the most deprived group (table).

Prescribing data were available for all 1007 patients with heart failure in the 22 practices selected a priori. These patients had similar distributions for age, sex, and deprivation to the total sample of 2186 patients (data not shown). Diuretics were prescribed for 812 (80.6%) of these 1007 patients, angiotensin converting enzyme inhibitors for 396 (39.3%), β blockers for 216 (21.4%), digoxin for 208 (20.7%), and spironolactone for 86 (8.5%). Both an angiotensin converting inhibitor and a β blocker were prescribed for 111 (11.0%) patients, and 13 (1.3%) were prescribed a combination of angiotensin converting enzyme inhibitor, β blocker, and spironolactone. Prescribing patterns did not vary by deprivation category on bivariate or multivariate analyses. Wide discrepancies were found in prescribing between general practitioners; these disappeared after adjusting for patient characteristics. Deprivation category and general practitioner were not independently associated with prescriptions for angiotensin converting enzyme inhibitors.

Discussion

Socioeconomically deprived people are more likely to develop heart failure but less likely to see their general practitioner on an ongoing basis. We did not find any relation between prescribing practices of general practitioners and socioeconomic status.

Although an increased incidence of heart failure in socioeconomically deprived people has not previously been reported, a US study showed an inverse association between incidence of heart failure and education.⁸ Our finding is not unexpected given data showing increased admissions to hospital for heart failure in deprived patients.^{1 3} Furthermore, as the risk factors for heart failure are more prevalent in socioeconomically deprived groups, it is plausible that the incidence of heart failure would be higher.^{9 10} Despite the noticeable gradient in incidence, there was only a trend towards differences in prevalence across the deprivation categories. This is not unexpected given that deprived patients with heart failure have higher case fatality rates and shorter survival times.³

Our finding that socially deprived individuals with heart failure have less ongoing contact with their general practitioners is novel, particularly as the limited

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Rates per 1000 population for incidence, prevalence, and contacts of patients with heart failure in primary care, stratified by socioeconomic status

Deprivation category	Sample size	Prevalence		Incidence		Contacts		Annual contacts per patient	Estimated mean survival (years)*
		Crude	Adjusted	Crude	Adjusted	Crude	Adjusted		
1 (most affluent)	70 961	6.3	6.4	1.8	1.8	16.8	17.1	2.6	3.5
2	66 633	7.5	7.4	1.7	1.6	20.0	19.6	2.7	4.4
3	93 258	7.3	7.5	1.9	1.9	17.5	19.6	2.4	3.8
4	34 627	7.3	7.5	2.6	2.7	16.6	17.9	2.3	2.8
5 (most deprived)	28 633	6.7	7.2	2.4	2.6	13.4	14.3	2.0	2.8
Odds ratio between categories 5 and 1		1.06	1.13	1.33	1.44	0.80	0.84	0.77	0.80
P for trend		0.27	0.06	0.002	0.0003	<0.001	0.07	<0.001	<0.001

Adjusted rates are age and sex standardised to distribution found in entire continuous morbidity recording practice population.

*Crude prevalence divided by crude incidence.

What is already known on this topic

Socioeconomic deprivation is associated with more frequent admissions to hospital and higher mortality in patients with heart failure

These excess risks are independent of age, sex, comorbidities, severity of disease, and adherence to treatment

These excess risks may arise because of differences in how socioeconomically deprived patients are managed by general practitioners

What this study adds

Socioeconomically deprived patients are 44% more likely than affluent patients to develop heart failure

Once heart failure develops, these patients have 23% less ongoing contact with their general practitioner

General practitioner prescribing does not differ between affluent and socioeconomically deprived patients

data in this discipline suggest that socially deprived patients with heart failure have a worse functional status.^{11 12} Several potential factors may contribute to these lower consultation rates. Firstly, the behaviour of deprived groups when ill is substantially different, fatalism is more common, and non-professionals are often consulted for healthcare advice.⁴ Secondly, socially deprived patients may seek care in hospital emergency rooms rather than from primary care physicians.^{13 14} Thirdly, general practitioners may fail to offer regular follow up care. This is argued against by the comparable rates of prescribing across the social class spectrum. Although we do not know the consequences of less frequent follow up, other studies suggest that lack of contact may be important for patients with chronic diseases. A retrospective analysis from Canada found improved survival rates in patients with heart failure who were regularly followed by a physician (P Kaul, personal communication, 27 July 2003). Finally, a wealth of evidence shows that closer follow up of patients with heart failure leads to better outcomes.¹⁵

We did not find any evidence of socioeconomic bias in general practitioners' prescribing patterns. Although we had no information on patient adherence, an earlier study did not find any differences in compliance with diuretics between deprived and affluent patients with heart failure.¹

Our study had some limitations. Firstly, we had no independent confirmation of heart failure diagnoses or data on disease severity. It seems unlikely, however, that individual clinicians would apply different case definitions or diagnostic thresholds in patients of differing socioeconomic status. Secondly, we had no data on potential confounders related to cardiovascular risk factors, and these may vary substantially across socioeconomic gradients. Although this may account for the observed differences in incidence, it does not explain the socioeconomic gradients in contacts after diagnosis. Thirdly, we used postcode sector as a proxy for individual socioeconomic status.¹⁶ Finally, counting only those drugs that had been prescribed at least twice over 12 months may have increased data quality at the cost of underestimating prescribing rates. However, we

were interested in chronic prescribing, and if there was any underestimation it is unlikely to have varied differentially between deprivation categories.

Although the incidence of heart failure diagnosed in general practice is significantly higher in socioeconomically deprived people, subsequent follow up is significantly less frequent. Although we found no evidence of socioeconomic bias in general practitioners' prescribing, it is likely that socioeconomic status may play more of a part in countries with healthcare systems that are not publicly funded.¹⁷ Regardless, our study has eliminated the prescribing bias hypotheses commonly cited as a potential explanation for the socioeconomic gradients in heart failure. Indeed, our data raise another potentially important explanation, that socioeconomically deprived patients may have poorer outcomes because they have less ongoing contact with their general practitioner.

Contributors: See bmj.com

Funding: FMcA is supported by the Canadian Institutes of Health Research and the Alberta Heritage Foundation for Medical Research, SS is supported by the National Health and Medical Research Council of Australia and the National Heart Foundation of Australia, and NM is funded by the British Heart Foundation.

Competing interests: None declared.

Ethical approval: Not required.

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(Accepted 20 February 2004)

doi 10.1136/bmj.38043.414074.EE