General practice characteristics associated with rates of testing and detection of hepatitis C:

cross-sectional study in Nottingham and Derbyshire

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ABSTRACT

The aim of this study was to determine general practice characteristics associated with testing rates for hepatitis C virus (HCV) and the proportion of tests with a positive result. The study included all patients tested for HCV from all general practices in the primary care trusts in Nottingham and Southern Derbyshire, UK over 2 years. There was a large variation between practices in HCV testing rates and the proportion of positive tests. Single-handed practices had higher testing rates and rates of positive results. Practices where at least half of the GPs were female had higher testing rates but lower positivity rates. The variation observed was not explained by deprivation or rurality of the practice.

Keywords
diagnosis; hepatitis C; primary health care.

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INTRODUCTION

Hepatitis C virus (HCV) infection is a major healthcare problem throughout the world. Estimates of prevalence in England suggest that approximately 0.4% of the population is chronically infected with hepatitis C, amounting to around 200 000 cases.[1] Reporting to the Communicable Disease Surveillance Centre indicates that approximately 38 000 HCV infected individuals had been identified in England by the end of 2003, representing less than one-fifth of the total number estimated from seroprevalence studies.[2] Furthermore only around 50% of the infected individuals who are identified are subsequently referred for further investigation and management.[3] We are therefore failing to identify, diagnose, and manage the vast majority of patients in the UK with chronic HCV infection.

There are at present no data on the frequency of testing for HCV in primary care. We undertook a study designed to describe variations in rates of testing for HCV between general practices and to examine specific practice characteristics that might affect testing rates and the proportion testing positive.

METHOD

We undertook a cross-sectional study based in all 199 general practices in the nine primary care trusts in Nottingham and Southern Derbyshire. Our study population was all patients from those practices tested for HCV between 1 November 2000 and 31 October 2002. We included tests sent from the 199 general practices and excluded samples sent from other sources. We identified the samples sent by the practices using the computer systems in the microbiology laboratories in Nottingham and Derby. Where individual patients had more than one test performed, we coded them as positive if any of the tests had been positive.

We obtained data on characteristics of the study practices using general medical services (GMS)

contract data. These characteristics included the age–sex structure of the registered population, number of GP partners, age and sex of the individual GPs, training status, the Townsend score associated with the electoral ward where the surgery was located as a measure of deprivation and the Carstair's rurality score.

We calculated two outcomes for each practice: the rate of testing for HCV using the practice population as the denominator, and the positivity rate, which was the number of patients testing positive out of the number of patients tested in each practice. We used negative binomial regression to calculate rate ratios using Stata (version 8.0). Our explanatory variables were partnership size (categorised into single handed and partnerships), training status, deprivation (Townsend score categorised into fifths), and the age and sex composition of the GPs in each practice. We coded practices according to whether 50% or more of the GPs in each practice were female and whether the mean age of the GPs in each practice was 45 years or over (which was the median of the mean ages of GPs by practice). We calculated unadjusted rate ratios and performed a multivariable analysis including all the explanatory variables and the proportions of male patients aged 15–24 years and aged 25–44 years. We selected a significance level of 0.01.

RESULTS

In the 2-year study period a total of 22 244 tests for hepatitis C were performed in Nottingham and Derby for 15 508 individual patients. Of these tests, 3715 were requested by the 199 study practices, of which 3531 (22.8% of 15 508) were for patients whose first test was initiated by the study practices. Of these 3531 patients, 100 were HCV positive (2.8%). These 100 patients were from 65 of the study practices.

Table 1 describes the characteristics of the 199 practices, and the HCV testing rate and positivity rate. There was a large variation in HCV testing rates between practices with a median rate of 2.4 patients tested per 1000 over 2-years (range = 0–53 per 1000). Twelve practices (6% of 199) sent no tests in the 2-year study period. The median positivity rate was 0% (range = 0–67%). Table 2 shows the results of the multivariable analyses. Single-handed practices had 177% higher testing rates (adjusted rate ratio = 2.77, 95% confidence interval [CI] = 1.85 to 54.16) compared with partnership practices after adjustment for all the other factors in the analysis, and practices in which at least half of the GPs were female had 59% higher rates (adjusted rate ratio = 1.59, 95% CI = 1.13 to 2.25). There were no other significant relationships with testing rates.

In the multivariable analysis of positivity rates there were two associations of borderline statistical significance: single-handed practices had 88% higher rates of positive results compared to partnership practices (adjusted rate ratio 1.88, 95% CI = 1.05 to 3.36, P = 0.03) and practices where at

How this fits in

Hepatitis C virus infection is a major public health problem. It is estimated that around 200 000 people are chronically infected with hepatitis C in England. Only a minority of people infected with hepatitis C are tested and diagnosed. In 2002 the Department of Health published the *Hepatitis C Strategy for England*. One of the main aims of this strategy is to increase testing for hepatitis C to identify those who are chronically infected. Little is known about rates of testing for hepatitis C in primary care. This study determined testing rates hepatitis C in general practice and examined whether certain characteristics of general practices are associated with their testing rates. There is wide variation in testing rates for hepatitis C between general practices. Single-handed practices and practices with more female GPs have higher testing rates, and single-handed practices also have higher rates of positive results.

Table 1. Characteristics of the 199 study practices.

	n	%	Median testing rate (IQR) per 1000 patients over 2 years
Total registered population	1 232 659	–	
Deprivation (Townsend fifths)			
1 (most affluent)	39	19.6	1.60 (0.55–4.51)
2	39	19.6	2.31 (1.10–5.93)
3	42	21.1	1.23 (0.67–2.49)
4	39	19.6	3.80 (1.80–7.12)
5 (most deprived)	40	20.1	3.65 (1.24–7.91)
Rurality of practice			
Rural	25	12.6	1.60 (0.48 to 3.98)
Urban	174	87.4	2.50 (0.92 to 5.96)
Single-handed practice			
No	157	78.9	1.89 (0.81 to 4.16)
Yes	42	21.1	6.77 (1.99 to 12.23)
Practice with 50% female GPs or more			
<50	135	67.8	2.30 (0.80 to 4.88)
≥50	64	32.2	3.38 (0.96 to 6.31)
Mean age of GPs in practice			
≤45 years	99	49.7	1.73 (0.84 to 4.51)
≥45 years	100	50.3	3.25 (0.89 to 7.48)
GP training practice			
No	164	82.4	2.52 (0.89 to 5.70)
Yes	34	17.1	1.75 (0.72 to 3.98)
Median HCV testing rate (IQR) per 1000 population over 2 years			2.44 (0.84 to 5.43)
Median HCV positivity rate (IQR) per 100 patients tested			0.00 (0.00 to 4.76)

HCV = hepatitis C virus. IQR = interquartile range.

Table 2. Results from the analyses of patient HCV testing rates and positivity rates (number positive/number tested) and practice characteristics.

	Testing rates			Positivity rates[a]		
Factor	Adjusted rate ratio[b]	95% CI	*P*-value	Adjusted rate ratio[b]	95% CI	*P*-value
Deprivation (Townsend fifths):						
1 (most affluent)	1.00			1.00		
2	1.04	(0.60 to 1.80)	0.90	0.41	(0.19 to 0.88)	0.02
3	0.55	(0.31 to 0.97)	0.04	0.60	(0.26 to 1.39)	0.23
4	1.12	(0.63 to 1.98)	0.71	0.41	(0.19 to 0.92)	0.03
5 (least affluent)	1.15	(0.64 to 2.09)	0.64	0.39	(0.17 to 0.91)	0.03
Test for trend			0.48			0.09
Urban versus rural practice	1.01	(0.54 to 1.89)	0.97	0.91	(0.37 to 2.21)	0.84
Single-handed practice versus partnership	2.77	(1.85 to 4.16)	0.001	1.88	(1.05 to 3.36)	0.03
GP training practice (yes versus no)	0.91	(0.60 to 1.37)	0.64	0.91	(0.50 to 1.64)	0.75
Practice with 50% female GPs or more	1.59	(1.13 to 2.25)	0.009	0.51	(0.28 to 0.91)	0.02
Practices with mean age of GPs in practice ≥45 years	0.92	(0.67 to 1.26)	0.61	0.76	(0.46 to 1.24)	0.27

[a]Excludes 12 practices where no patients were tested. [b]Adjusted for other factors in table and % males in practice aged 15–24 years and % males aged 25-44 years. HCV = hepatitis C virus.

least half of the GPs were female had lower positivity rates than other practices (adjusted rate ratio 0.51, 95% 0.28 to 0.91, $P = 0.02$). There was no clear association between deprivation and positivity rates although compared with practices in the most affluent fifth of areas, practices in less affluent areas had lower positivity rates.

Results were similar when a small number of practices with very high testing or positivity rates were excluded from the analysis, and when rurality was removed from the multivariable models.

DISCUSSION

In this cross-sectional study there was a substantial variation in hepatitis C testing rates across the study practices with 6% of practices sending no tests in a 2-year period. Single-handed practices had higher testing and detection rates than larger practices after taking deprivation, rurality, age and sex of the GPs and training status of the practice into account. Similarly, practices where at least half of the GPs were female had significantly higher testing rates. The age of the practitioners and whether the practice trained doctors were not associated with testing rates; also surprisingly there was no effect of deprivation in the multivariable analysis.

This study has a cross-sectional design and can only identify associations. Also we were only able to obtain limited data on patients, so could not explore whether the associations found with certain practice characteristics may be explained by different distributions of patients' characteristics across the practices.

The effect of physician sex on patient satisfaction, physician–patient relationships and organisation and provision of services has been well documented. One study found that female physicians spend a significantly greater proportion of patient visits on preventive services and counselling about psychological issues,[4] also patients tend to talk more to female physicians than their male counterparts and to disclose more biomedical and psychosocial information.[5] This may help to explain our findings. HCV is a sensitive issue, for which the main risk factor is drug misuse, and it is possible that patients seek out female GPs to discuss their risk of HCV. Alternatively, female GPs may encourage patients to discuss sensitive issues such as drug misuse.

Our findings on single-handed practices may be interpreted in light of the results of a study that studied practice size and its impact on consultation length, workload and patient assessment of care.[6] Campbell *et al* found that although GPs from smaller practices had shorter average consultation lengths, patients from smaller practices reported improved accessibility to care and better continuity of care.[6] Perhaps then, patients from smaller practices have greater opportunity for relationship

building and feel more able to disclose information about risk-taking behaviour that may lead to the physician carrying out a HCV test.

In conclusion we have found considerable variation between general practices in testing rates for HCV. Our findings for single-handed practices and practices with more female GPs suggest that either those at highest risk of hepatitis C migrate towards single-handed practices and practices with more female doctors, or that single handed and female GPs are more aware of testing for hepatitis C, and also that single-handed GPs are better at selecting those to test.

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Ethics committee
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Competing interests
The authors have stated that there are none

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