Which factors are associated with higher rates of chronic kidney disease recording in primary care?

A cross-sectional survey of GP practices

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ABSTRACT

The prevalence of chronic kidney disease (CKD) at stage 3–5 is estimated at 8.5% in the UK, but the recorded rate of CKD from Quality and Outcomes Framework (QOF) registers in 2007–2008 was 2.9%. This study aimed to identify practice or patient characteristics associated with recorded rates of CKD. Demographic and QOF data for 230 general practices were combined into a database for cross-sectional analysis. Regression analyses investigated factors associated with CKD recording; deprivation, location in Leicester city or Northamptonshire, and low recording of hypertension and stroke were associated with low CKD recording.

Keywords

diagnosis; kidney diseases; primary health care; renal insufficiency, chronic.

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INTRODUCTION

Recording of chronic kidney disease (CKD) in primary care remains low despite its inclusion in the Quality and Outcomes Framework (QOF) of the general medical services contract in 2006. A systematic UK population study reported the prevalence of CKD at stage 3–5 to be 8.5%;[1] however national QOF reports from 2007–2008 reported a mean practice recording rate of CKD to be only 2.9%.[2]

Early detection and subsequent management of CKD are essential, as patients who present late to primary or secondary care suffer worse morbidity and mortality compared with the general population.[3–5] To date, there are no studies of the factors that influence CKD recording in primary care. An understanding of those factors that are associated with CKD recording would help develop strategies to improve the situation.

METHOD

Data from QOF reports for April 2007–March 2008 were obtained from the NHS Information Centre[2] for 230 practices across three primary care trusts (PCTs). The CKD recording rate represented the detection rate of CKD for each practice and was calculated by dividing the number of patients on the disease registers, produced for the QOF, by the total practice list size. Variables that were investigated when looking for associations with CKD recording included total QOF points, practice list size, the responsible PCT, and whether the practice had training status. Recording rates for coronary heart disease (CHD), hypertension, diabetes, and stroke were also used to investigate associations between CKD recording and the recording of predisposing chronic conditions.

Three patient variables were also investigated: age (over 64 years), ethnicity (percentage of patients in each practice from black and minority ethnic populations), and deprivation level. Results from the 2007 GP Access survey were used to provide an

How this fits in

Chronic kidney disease (CKD) is an independent risk factor for cardiovascular disease. Early detection of CKD is associated with reduced morbidity and mortality. The recording rate of CKD in primary care is below the predicted prevalence described in large UK population-based studies. Improved recording of CKD in primary care could reduce the health consequences of kidney disease. Investigating patient and practice characteristics associated with low recording may enhance patient care and inform the implementation of local or national CKD guidelines.

estimate of the percentage of patients from black and minority ethnic populations registered at each practice.[2] Deprivation was represented by the Index of Multiple Deprivation (IMD) score for each practice, calculated as a mean for the practice population.[6]

All analyses were carried out at practice level, as individual-level data were not available. Initial descriptive analysis and univariable analyses, including correlation statistics, preceded backward selection multiple linear regression. All analyses were performed at a practice level using SPSS (version 16.0) and SAS (version 9.1.3).

Table 1. Descriptive statistics for recording rates of chronic kidney disease by practice and patient characteristic.

Practice/patient characteristic	Mean (SD)	Median (IQR)	Range
CKD recording rate, %	2.89 (1.62)	–	0.03–7.34
Practice list size	–	6347.50 (3633.25–10233.00)	707–34494
Total QOF points attained	–	988.71 (961.60–995.95)	699.27–1000
Deprivation, IMD	–	15.82 (9.69–27.01)	5.10–60.28
Ethnicity, % BME populations	–	5.00 (1.00–17.50)	0–99
Patients aged >64 years, %	14.71 (4.11)	–	1.03–24.74
Recording rate: CHD, %	–	3.24 (2.77–3.61)	0.01–5.18
Recording rate: stroke, %	–	1.44 (1.13–1.69)	0.00–2.55
Recording rate: hypertension, %	–	12.57 (11.31–14.80)	0.47–24.62
Recording rate: diabetes mellitus, %	–	3.93 (3.45–4.59)	0.39–10.25

BME = black and minority ethnic. CHD = coronary heart disease. CKD = chronic kidney disease. IMD = Index of Multiple Deprivation. IQR = interquartile range. QOF = Quality and Outcomes Framework. SD = standard deviation.

Table 2. Correlation between practice/patient characteristic and chronic kidney disease recording rate.

Characteristic	Spearman's coefficient (95% CI)	*P*-value
Recording rate: coronary heart disease	0.42 (0.3 to 0.52)	<0.001
Recording rate: diabetes	0.22 (0.09 to 0.34)	<0.001
Recording rate: stroke	0.43 (0.31 to 0.53)	<0.001
Recording rate: hypertension	0.49 (0.37 to 0.58)	<0.001
Practice list size	0.17 (0.04 to 0.30)	0.009
Ethnicity	–0.22 (–0.34 to –0.08)	0.001
Index of Multiple Deprivation	–0.45 (–0.55 to –0.33)	<0.001
Total QOF attainment	0.30 (0.17 to 0.41)	<0.001
	Pearson's coefficient (95% CI)	
Age >64 years	0.45 (0.33 to 0.55)	<0.001

QOF = Quality and Outcomes Framework.

RESULTS

A total of 230 practices were included (Leicester City PCT, *n* = 63; Leicestershire County and Rutland PCT, *n* = 84; Northamptonshire PCT, *n* = 83). The range of practice recording rates for CKD was 0.03–7.34% (mean 2.89%, median 2.83%). Descriptive statistics for each variable are shown in Table 1.

Univariable analyses

Variables with positive correlations with CKD recording rates included hypertension, CHD, diabetes, stroke, age over 64 years, practice list size, and total QOF attainment (Table 2). Low deprivation and practices with small numbers of people from black and minority ethnic populations were significantly correlated with higher CKD recording. No significant difference between the mean detection rate recorded at training practices and that recorded at non-training practices was observed (3% versus 2.8%, $P = 0.424$, independent *t*-test).

Multivariable analysis

Regression modelling identified that higher CKD recording rates were associated with higher recording rates for hypertension ($P<0.001$) and stroke ($P<0.01$) and practices in areas of lower deprivation ($P<0.001$). Practices in Leicestershire County and Rutland PCT had significantly higher recording rates than either Leicester City ($P = 0.046$) or Northamptonshire ($P = 0.004$). The adjusted r^2-value for the final multivariable model was 0.38.

DISCUSSION

Summary of main findings

CKD recording rates for the year 2007–2008 for practices in Leicestershire, Northamptonshire, and Rutland are significantly lower than the estimates of prevalence in recent population studies.[6–9]

The number of patients with hypertension and stroke, which are known to be associated with CKD, is associated with CKD recording rates but other factors are also important. Low socioeconomic deprivation and the responsible PCT were associated with higher practice CKD recording, although the practice variables of training status, list size, and total QOF points were not.

Strengths and limitations of the study

This is the first study to investigate factors associated with CKD recording. Although the population and practices in this study are diverse, care should be taken when extrapolating the results to practices in other regions of the UK. The authors relied on routinely available data and have not undertaken detailed investigations in smaller samples of practices. Furthermore, the completeness of QOF data is dependent on the primary care team entering information into their computer systems.

The ethnicity data in this study was taken from the GP Access survey as complete data were not available from other sources. These data only provide ethnicity information for patients who respond to the survey and are, therefore, only a crude estimate of the true proportion of patients from minority ethnic groups in a practice population.

Comparison with existing literature

The Association of Public Health Observatories (APHO) has produced prevalence estimates of CKD at stage 3–5 for all PCTs in the UK from New Opportunities for Early Renal Intervention by Computerised Assessment (NEOERICA) data. APHO estimates for the prevalence of CKD at stage 3–5 were 9.2% for Leicestershire County and Rutland, 7.1% for Leicester City, and 8.4% for Northamptonshire. These rates are much higher than those obtained from QOF CKD registers for 2007–2008 (3.62%, 2.26%, and 2.62% for each PCT respectively).

Deprivation was associated with lower CKD recording. The current study does not, however, provide an explanation for this. This effect has been widely studied in primary care.[8,10,11] Poorer health outcomes in areas of deprivation may be associated with the organisation and accessibility of local health care, and potentially also characteristics of the patient population.

Implications for clinical practice and future research

Differences between estimated prevalence and recording rates of CKD in primary care suggest that more focused research is required to determine how to improve detection and health outcomes. A wide range of recording rates for other chronic diseases was noted between individual practices, suggesting that some practices may also be under-recording other diseases.

Practices in areas of high deprivation with low recording may require enhanced support in improving the care of patients with CKD. Further research is required to investigate barriers to recording CKD; this could help implement tailored solutions to improve patient care and the use of national and local guidance.

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Competing interests

The authors have stated that there are none.

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