Recorded quality of primary care for osteoarthritis:
an observational study

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ABSTRACT

Background
Osteoarthritis is the most common chronic disease in the UK, with greater prevalence in women, older people, and those with poorer socioeconomic status. Effective treatments are available, yet little is known about the quality of primary care for this disabling condition.

Aim
To measure the recorded quality of primary care for osteoarthritis, and assess variations by patient and/or practice characteristics.

Design of study
Retrospective observational study.

Setting
Eighteen general practices in England.

Method
Records of 320/393 randomly selected patients with osteoarthritis (response rate 81%) were reviewed. High-quality health care was specified by nine quality indicators. Logistic regression modelling assessed variations in quality by age, sex, deprivation, severity, time since diagnosis, and practice size.

Results
There was substantial variation in the recorded achievement of individual indicators (range 5% to 90%). The percentage of eligible patients whose records show that they received care in the form of information provision ranged from 17% to 30%. For regular assessment indicators the range was 27% to 43%, and for treatment indicators the range was 5% to 90%. Recorded achievement of quality indicators was higher in those with more severe osteoarthritis (odds ratio [OR] 1.38, 95% CI = 1.13 to 1.69) and in older patients (OR 1.14, 95% CI = 1.02 to 1.28). There were no significant variations by deprivation score.

Conclusion
This study has demonstrated the feasibility of using existing robust quality indicators to measure the quality of primary care for osteoarthritis, and has found considerable scope for improvement in the recording of high-quality care. The lack of variation between practices suggests that system-level initiatives may be needed to achieve improvement. One challenge will be to improve care for all, without losing the equitable distribution of care identified.

Keywords
osteoarthritis; primary health care; quality of health care; quality indicators.

INTRODUCTION

Osteoarthritis causes substantial morbidity in developed countries. In the UK it is the most prevalent chronic disease among adults aged 65 years and over, affecting 32% of men and 47% of women.[1] It is also the most common cause of disability.[2] Osteoarthritis is an age-related condition,[3] and there is a greater level of need among women and those from more deprived backgrounds.[4] Those in poorer socioeconomic groups and women have higher levels of need for hip and knee replacement but receive relatively fewer joint replacements.[4–6] Many individuals are living for prolonged periods with severe osteoarthritis.

High-quality primary care is of clear importance for such a prevalent condition that has both major personal and social impact. This has been recognised by the National Institute for Health and Clinical Excellence (NICE), which has recently published guidelines for the care and management of osteoarthritis in adults.[7] However, there is little published information on the quality of primary care for osteoarthritis in the UK. US studies have found the quality of osteoarthritis primary care to be suboptimal, with achievement of quality measures ranging from 31% to 64%.[8]

This study assessed the overall quality of recorded osteoarthritis treatment in primary care in an English county. It also assessed whether the recorded

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How this fits in

Osteoarthritis is the most common cause of disability in the UK, but little is known about the quality of primary care for people with osteoarthritis. Quality indicators can be used to measure the extent to which primary care for osteoarthritis meets pre-determined standards. This study found shortfalls in the recorded quality of osteoarthritis primary care. Quality varied by patients' age and by the severity of osteoarthritis, but not by their postcode deprivation score.

achievement of quality indicators (QIs) was associated with particular patient characteristics linked to the epidemiology and natural history of osteoarthritis, or with practice characteristics.

METHOD

Data collection

Eighteen general practices in Norfolk were selected to give equal numbers in three groups stratified by national deprivation score. This was done to ensure a range similar to the England profile. Practice deprivation scores were calculated as weighted means, based on the 2004 Indices of Multiple Deprivation (IMD) deprivation scores of each practice's registered patients.[9]

Between 20 and 40 randomly selected eligible patients at each practice were contacted for permission to examine their full patient records. Eligible patients were aged ≥55 years, with diagnosed osteoarthritis or a symptom code for arthralgia (unless this was not due to osteoarthritis). They had consulted for osteoarthritis in the 12 months preceding data collection. The study was part of a wider analysis,[10] and two rounds of data collection were undertaken, one in 2003 (*n* = 162) and one in 2005 (*n* = 158).

Data were extracted from electronic and paper records of 320 patients to assess recorded care against nine indicators. All aspects of the electronic medical records were included in the search for evidence of QIs, such as Read Code/BNF recording and free text. The entire paper record from date of diagnosis was also included. The data were extracted from patient records, with the researcher examining 305 records and an assistant examined 15 records.

Derivation of quality indicators

The included QIs were based on current evidence and were peer-reviewed by independent clinical panels, including UK GPs, in advance of the study. They originated from at least one of the following sources: NICE;[11] RAND health indicators adapted by an independent expert panel including British GPs for the UK;[12] and Quality Indicators for General

Table 1. Indicators of quality of osteoarthritis treatment in primary care.

QI number	Quality indicator (QI)	Source
Information provision indicators		
1	The percentage of patients with symptomatic osteoarthritis, whose notes contain a record that they have been offered education regarding the natural history, treatment, and self-management of the disease at least once	RAND
2	The percentage of patients with osteoarthritis treated with an NSAID, whose notes contain a record that they have been advised of the gastrointestinal and renal risks associated with this drug	RAND
Regular assessment indicators		
3	The percentage of patients treated for symptomatic osteoarthritis, whose notes contain a record that they have been assessed for functional status in the last year	RAND
4	The percentage of patients treated for symptomatic osteoarthritis, whose notes contain a record that they have been assessed for degree of pain in the last year	RAND
5	The percentage of patients with osteoarthritis regularly treated with an NSAID, whose notes contain a record that they have been asked about gastrointestinal symptoms within the previous 12 months	RAND
Treatment provision indicators		
6	The percentage of patients in whom oral pharmacological therapy was initiated to treat osteoarthritis, whose notes contain a record that they were offered paracetamol first (unless contraindicated)	RAND QIGP
7	The percentage of patients with osteoarthritis treated with an NSAID, whose notes contain a record that ibuprofen (or a cox-2 inhibitor) has been considered for first-line treatment (unless contraindicated or intolerant)	NICE QIGP
8	The percentage of patients with severe symptomatic osteoarthritis of the knee or hip that has failed to respond to non-pharmacological and pharmacological therapy, whose notes contain a record that they were offered referral to an orthopaedic surgeon to be evaluated for total joint replacement within 6 months unless surgery is contraindicated	RAND
9	The percentage of patients in whom oral pharmacological therapy was changed from paracetamol to a different oral agent, whose notes contain a record that they were offered a trial of maximum-dose paracetamol	RAND

RAND = RAND health indicators adapted for the UK.[12] QIGP = Quality Indicators for General Practice.[13] NICE = National Institute for Health and Clinical Excellence.[11] NSAID = non-steroidal anti-inflammatory drug.

Practice (QIGP) developed at the National Primary Care Research and Development Centre.[13] The included indicators covered the provision of information (QIs 1 and 2); regular assessment of pain, function, and side effects (QIs 3–5); and the provision of treatment (QIs 6–9; Table 1).

Data analysis

The number and proportion of eligible patients whose records indicated that each quality of care indicator was achieved was calculated. The proportion achieving indicators was analysed in relation to practice characteristics (practice level deprivation[9] and size) and patient characteristics (age, sex, deprivation, severity of osteoarthritis, and time since diagnosis). Patient deprivation was calculated by using the National Statistics Postcode Directory 2007[14] to find each patient's Lower Super Output Area (LSOA) of residence, and using the IMD 2007[15] rank of this LSOA as an indicator of deprivation. All other information was obtained directly from patient records. Severe osteoarthritis was defined as 'symptomatic osteoarthritis of the knee or hip that has failed to respond to non-pharmacological and pharmacological therapy'.[12,16,17] The same definition was used to assess eligibility for QI 8, resulting in co-linearity of achievement of QI 8 with severe osteoarthritis. Multivariate logistic regression modelling of achievement of QIs was conducted including all patient and practice characteristics. Analyses were undertaken using Stata (version 9.1 StataCorp, College Station, TX, US).

RESULTS

Participants

A total of 320 patient records from 18 practices were examined. The patient response rate was 81% (320/393). Median age of participants was 71 years (range 55–95 years), and 65% (*n* = 209) of participants were female (Table 2). Non-responders were of similar age and sex to responders, with a median age of 70 years and 65% being female. Practice sizes and deprivation levels broadly reflected the range seen across England.[10]

Achievement of quality indicators

Recorded achievement of individual QIs ranged from 5% (1% to 14%) for QI 9, to 90% (84% to 95%) for QI 8 (Table 3). QI 9 was achieved for only 3 of 61 eligible participants, and did not undergo logistic regression analysis due to the small numbers achieving the indicator. Recorded achievement ranged from 5% to 90% for indicators relating to the provision of treatment (QIs 6–9), from 17% to 30% for those relating to information provision (QIs 1 and 2), and 27% to 43% for those relating to regular

assessment (QIs 3–5). Only QI 7 and QI 8 were achieved for over half of eligible participants.

Effect of practice and patient characteristics

Recorded achievement of QIs was not associated with either patient or practice-level deprivation, practice size, or time since diagnosis. Odds ratios for the explanatory variables that were statistically significantly associated with quality (*P*<0.05) are shown in Table 3.

Recording of provision of education regarding the natural history, treatment, and self-management (QI 1) was less likely for older participants (OR 0.66, 95% CI = 0.48 to 0.90) compared with individuals 10 years younger; *P* = 0.004). Median age was 69 years where a record was found, compared with 72 years where it was not (*P* = 0.012). It was also more likely for women than men (OR 1.74, 95% CI = 1.01 to 3.00; *P* = 0.047).

A record of regular assessment (QIs 3 and 4) having been carried out was more likely for patients with more severe osteoarthritis (QI 3: OR 4.20, 95% CI = 2.58 to 6.85; *P*<0.001; and QI 4: OR 4.09, 95% CI = 2.39 to 6.99; *P*<0.001).

Table 2. Distribution of practice and patient variables by participant.

Practice variables	Description	*n*	%
Practice deprivation	Low (IMD 2004 rank 0–39.9%)	135	42.2
	Medium (IMD 2004 rank 40–64.9%)	92	28.8
	High (IMD 2004 rank 65–100%)	93	29.1
	Total	320	100.0
Practice size	Small (501–5000 patients)	49	15.3
	Medium (5001–10 000 patients)	150	46.9
	Large (>10 000 patients)	121	37.8
	Total	320	100.0
Patient variables			
Sex	Male	111	34.7
	Female	209	65.3
	Total	320	100.0
Severity of osteoarthritis	Severe	123	38.4
	Not severe	194	60.6
	Total	317	99.1
Time since diagnosis	<2 years	98	30.6
	≥2 years	220	68.8
	Total	318	99.4
Patient LSOA deprivation	High (IMD 2007 rank 106–18 562)	162	50.6
	Low (IMD 2007 rank 18 721–31 754)	151	47.2
	Total	313	97.8
Total		320	100
		Median	Range
Age, years		70.5	55–95

Percentages do not always add up to 100.0 due to rounding. IMD = Indices of Multiple Deprivation.[9] LSOA = Lower Super Output Area.

Table 3. Achievement of quality indicators (QIs) and related practice and patient characteristics.

	Achievement of QIs			Multivariate analysis[a,b,c]			
	Number of	QI met		Statistically significant associated			
QI	patients eligible	*n*	% (95% CI)	characteristics (*P*<0.05)	Odds ratio	95% CI	*P*-value
Information provision indicators							
1	318	96	30 (25 to 36)	Age versus 10 years younger	0.66	0.48 to 0.90	0.004
				Female	1.74	1.01 to 3.00	0.047
2	198	33	17 (12 to 23)	None			
Regular assessment indicators							
3	319	137	43 (38 to 49)	Severe OA versus less severe	4.20	2.58 to 6.85	<0.001
4	319	85	27 (22 to 32)	Severe OA versus less severe	4.09	2.39 to 6.99	<0.001
5	113	34	30 (22 to 39)	None			
Treatment provision indicators							
6	268	129	48 (42 to 54)	Age versus 10 years younger	1.79	1.34 to 2.59	<0.001
7	196	116	59 (52 to 66)	Age versus 10 years younger	1.63	1.10 to 2.37	0.006
8	123	111	90 (84 to 95)	None			
9	61	3	5 (1 to 14)	Insufficient data			

[a]*Multivariate logistic regression.* [b]*QIs with incomplete records of explanatory variables excluded: three participants had incomplete severity information; two had incomplete length of diagnosis; eight had no Lower Super Output Area deprivation score.* [c]*Age entered in regression analysis as continuous measure and then odds ratio converted from a difference of 1 to 10 years, thus the presented odds ratios represents a difference of 10 years at any point on the age scale. OA = osteoarthritis.*

Recorded achievement of two QIs (QIs 6 and 7) referring to pharmacological therapy was more likely for older participants (QI 6: OR 1.79, 95% CI = 1.34 to 2.59; *P*<0.001 compared with individuals 10 years younger; and QI 7: OR 1.63, 95% CI = 1.10 to 2.37; *P* = 0.006 compared with individuals 10 years younger). Where QIs 6 and 7 were achieved the median ages were 72 and 71 years respectively, compared with median ages of 67 and 66 years where they were not achieved (*P*<0.001 and *P* = 0.012).

DISCUSSION

Summary of findings

This study used nine evidence-based indicators to measure the quality of recorded primary care for osteoarthritis. For several indicators there was no indication in the majority of records examined that the expected level of care had been delivered, although there was substantial variation between indicators. Records of high-quality care were found more frequently in the notes of those with more severe osteoarthritis and older participants, but varied little by other patient or practice-level characteristics. The effects of age and severity on recording may be explained by aspects of the condition and of the service, such as the age-related nature of osteoarthritis and the likelihood of patients with a more severe condition consulting more often. The association with severity may also be indicative of the influence of case mix on the recorded quality of care.

Strengths and limitations of the study

This study used robust evidence-based, peer-reviewed clinical indicators to assess the quality of recorded primary care for osteoarthritis. The indicators refer to the processes of health care rather than outcomes, and as such have fewer problems with case–mix bias, may be more sensitive measures of quality, and are more clearly linked to remedial action to improve quality further. The size and deprivation scores of the study general practices were similar to the English national profile of general practices, and so the study findings may be generalisable nationally.

Full paper and electronic medical records were searched, and credit was given for any mention of the care, even if not fully documented. For example, credit for advising patients on non-steroidal anti-inflammatory drugs (NSAIDs) about gastrointestinal and renal risks was given for a record of 'UWG' ('usual warnings given') in the notes. Compilation of the dataset relied on information being recorded in patient records, and as such may not be a complete reflection of each patient's consultations. This study estimated recording of high-quality care as a proxy for quality of care itself. However, accurate recording of care is an essential component of effective multidisciplinary care for chronic conditions, and should correspond at least to minimum acceptable levels of care. Alternative methods of assessing quality of care might include analysis of videotaped consultations, but that would introduce different biases. The indicators included only encompass a

small proportion of care for osteoarthritis, and it is important to note that QIs cannot capture the full spectrum of patient-centred care.

Comparison with existing literature

Despite the high population impact of osteoarthritis,[1] the quality of primary care for osteoarthritis in the UK has not been investigated previously. A recent study considering quality of osteoarthritis primary care among patients aged ≥75 years in the US[8] concluded that the 'quality of osteoarthritis care for older adults is suboptimal', which is consistent with the findings of this study. Compared with the US study, a higher proportion of eligible patients in this study was referred for surgical treatment (90.2% versus 72.4%). However, a much lower proportion of patients appeared to be offered education about the condition (30.2% versus 68.7%), advised of the side effects of NSAID treatment (16.7% versus 41.5%), or assessed annually for functional status and degree of pain (34.8% versus 60.6%). These differences may stem partly from the older age of study participants in the US study and partly from the fact that this study relied on the recording of care in patient records instead of patient interview as used in the US study.

It has previously been shown that individuals from poorer socioeconomic backgrounds receive relatively fewer hip and knee replacements.[4–6] In contrast, this primary care-based study showed no variation in recorded offers of referral by deprivation status.

Implications for clinical practice

There are three main implications of this work. First, this study has demonstrated the feasibility of using existing robust QIs to measure the quality of primary care for osteoarthritis. Second, if the recorded quality found in this study reflects actual quality of care, there is substantial scope to improve the quality of osteoarthritis management in primary care in the UK for at least some of the aspects of care measured. Improvements in evidence-based care are likely to reduce the burden of disability caused by this condition. The lack of differences between practices suggests that a system-level intervention may be needed to improve care across the country. Interventions designed to improve achievement of these indicators should be piloted in a small number of practices with measurement of clinical outcomes. Third, the results showed an apparently equitable distribution of care with respect to deprivation, a notable achievement given the existing higher prevalence of osteoarthritis in those from deprived areas. As primary care practitioners start to deliver improved care for osteoarthritis, it will be a challenge to maintain the level of equity that this study has found.

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