

Quality of care for elderly residents in nursing homes and elderly people living at home: controlled observational study

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Abstract

Objectives To assess the quality of care given to elderly people and compare the care given to residents in nursing homes with those living in their own homes.

Design Controlled observational study.

Setting Primary care, Bristol.

Subjects Elderly individuals (aged ≥ 65 years) registered with three general practices, of whom 172 were residents in nursing homes (cases) and 526 lived at home (matched controls).

Main outcome measures The quality of clinical care given to patients was measured against explicit standards. Quality indicators were derived from national sources and agreed with participating general practitioners.

Results The overall standard of care was inadequate when judged against the quality indicators, irrespective of where patients lived. The overall prescribing of beneficial drugs for some conditions was deficient—for example, only 38% (11/29) (95% confidence interval 20% to 58%) of patients were prescribed β blockers after myocardial infarction. The proportion of patients with heart disease or diabetes who had had their blood pressure measured in the past two years (heart disease) or past year (diabetes) was lower among those living in nursing homes: for heart disease, 74% (17/23) *v* 96% (122/127) (adjusted odds ratio 0.18, 0.04 to 0.75); for diabetes, 62% (8/13) *v* 96% (50/52) (adjusted odds ratio 0.05, 0.01 to 0.38). In terms of potentially harmful prescribing, significantly more patients in nursing homes were prescribed neuroleptic medication (28% (49/172) *v* 11% (56/526) (3.82, 2.37 to 6.17)) and laxatives (39% (67/172) *v* 16% (85/526) (2.79, 1.79 to 4.36)). Nursing home residents were less likely to have the appropriate diagnostic Read code linked to their prescribed neuroleptic drug (0.22, 0.07 to 0.71).

Conclusions The quality of medical care that elderly patients receive in one UK city, particularly those in nursing homes, is inadequate. We suggest that better coordinated care for these patients would avoid the problems of overuse of unnecessary or harmful drugs, underuse of beneficial drugs, and poor monitoring of chronic disease.

Introduction

Concern has been expressed about the quality of medical care that elderly residents receive in residential and nursing homes.¹ General practitioners are responsible for the delivery of such care to residents in these homes. The number of elderly patients living in nursing homes rose substantially in the late 1980s and in the 1990s, resulting in a rise in workload for general practitioners.^{1,2} Concern has been expressed that the reduction in provision of long stay NHS beds for elderly people has increased the demand on general practitioners in this group of patients with high morbidity and disability.^{1,2} In response to these increasing demands, the arrangements made by general practices for delivering care to nursing homes seems to be inconsistent and idiosyncratic.³

More widespread concern has been expressed about drug treatment in elderly people.⁴ Anxiety about the risks of excessive prescribing of, for example, inappropriate neuroleptic drugs,⁵ is matched by concern about the consequences of the underprescribing of potentially beneficial drugs.⁴

Care of elderly people is now a national priority,⁶ and the quality of care delivered to patients is coming under increasing scrutiny through the use of explicit measures—“quality indicators”—which seek to judge the process of care against specific standards.^{7,8} No study has examined the overall quality of care given to elderly patients in UK primary care or has judged the quality of care against agreed, explicit standards in patients living in nursing homes compared with patients living at home. We aimed to evaluate one dimension of quality—clinical care given to patients.⁹ We measured the following components of poor clinical care: insufficient use of beneficial drugs; poor monitoring of chronic disease; and overuse of inappropriate or unnecessary drugs.⁹ The clinical care given to a sample of elderly patients living in nursing homes (cases) was compared with the clinical care given to elderly people living in their own homes (controls).

Methods

Subjects

Three general practices with registered patients resident in four Bristol nursing homes agreed to

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List of quality indicators used as basis for outcome measurements in the study

- All patients aged ≥ 65 years should be offered influenza vaccination⁷
- All patients with diagnosed coronary artery disease should (a) be prescribed aspirin 75-150 mg/day unless contraindicated; (b) have blood pressure recorded at least every two years; (c) if had a previous myocardial infarction, be prescribed a β blocker indefinitely unless contraindicated⁷
- All patients with diagnosed hypertension and who have been prescribed antihypertensive medication should (a) have blood pressure recorded at least every year; (b) have blood pressure controlled below 150/90 mm Hg⁷
- All patients with diagnosed diabetes should (a) have HbA_{1c} concentrations recorded at least every year; (b) have blood pressure recorded at least every year; (c) have blood pressure controlled below 140/80 mm Hg; (d) be offered influenza vaccination every year; (e) have been offered pneumococcal vaccination⁷
- All women aged > 50 years who have been prescribed antidepressants should be screened for hypothyroidism within the past three years⁷
- No patient should be prescribed thioridazine unless he or she is already receiving it, in which case it should be given in reducing dose till stopped²³
- Prescribing of neuroleptics should be according to US guidelines, including an appropriate morbidity Read code in the notes or clinical reason for starting the treatment (prescribing refers to drugs used in psychoses and related disorders, *British National Formulary*, section 4.2)²⁴
- Prescribing of laxatives should be appropriate (that is, if constipation has been diagnosed or if the patient has been prescribed a drug with constipation as a side effect)²⁵

participate in the study. TF provided care at one of these practices. All nursing home residents aged 65 years or over were identified from each practice's computerised list. In each practice, we randomly selected four patients who lived in their own homes to act as controls for each nursing home resident, stratifying by sex and age in 10-year bands. For strata with fewer than four controls per nursing home resident, we included all available control patients. We excluded patients with terminal illness.

Generation of quality indicators

We measured the quality of care with the "explicit process criteria" method,⁸ measuring the care given to patients against explicit quality standards or indicators. The quality indicators were derived mostly from a recognised and recently published textbook.⁷ We selected the quality indicators on the basis of their relevance to general practice, and care of elderly patients in particular. We advised the general practitioners responsible for delivering nursing home care in each of the three practices about the provisional set of quality indicators and gave them the relevant source of information to back up each quality indicator. We discussed and agreed with the general practitioners a set of quality indicators before starting the study (box).

Data collection

All the practices in the study use computer and paper patient records. We examined both formats for every patient. Data were extracted by JP or JB using a computerised data collection form. The following data were collected: Read code and diagnosis of up to 10 current problems; up to 15 currently prescribed drugs; influenza and pneumococcal immunisation, with date measured if the patient was diabetic; record of HbA_{1c} concentration if the patient was diabetic; blood pressure record if the patient had coronary artery disease, hypertension, or diabetes; and contraindications to aspirin or β blockers. Data were collected from November 2001 to February 2002.

Sample size

The primary outcome for the study was a documented record that the patient had either received vaccination against influenza since September 2001 or been offered the vaccine and refused. Unpublished data from the Somerset morbidity survey (R Martin, personal communication) showed that half of patients aged 65 or over would have received or been offered influenza vaccination in the winter of 1999-2000. To detect a difference of 13.5 percentage points in uptake or offer of vaccination (equivalent to an odds ratio of either 0.6 or 1.7), with 80% power, two sided 5% α , and a ratio of four community controls to every nursing home resident, we needed a total sample size of 695 patients.

Statistical analysis

Associations between residence (nursing home versus living at home) and the presence of quality indicators in patients' notes were investigated by using odds ratios. Using logistic regression, we adjusted crude odds ratios for age, sex, practice, and overall morbidity (indicated by the number of current problems and current drug treatment). All analyses were done with STATA software, version 7.0.

Results

We identified 172 nursing home residents and 526 controls from the three practices. Among those aged 80 years or over, fewer than four controls per nursing home resident were available, so all controls were included. Nursing home residents were older and had slightly fewer current diagnosed problems but were prescribed more drugs (table 1).

Of the 698 patients, 162 did not have any record of having either received or been offered influenza vaccination for the current winter. The likelihood of receiving influenza vaccination was not associated with place of residence (adjusted odds ratio 0.81, 95% confidence interval 0.53 to 1.26) (table 2).

Frequency of blood pressure measurement was poorer among nursing home residents than controls. Among patients with coronary artery disease, 74% (17/23) of nursing home residents (compared with 96% (122/127) of controls) had had their blood pressure measured in the past two years (0.18, 0.04 to 0.75) (table 2). There were no differences between the groups for prescribing of either aspirin or β blockers. Among patients with hypertension, 53% (18/34) of nursing home residents (compared with 85% (174/204) of controls) had had their blood pressure

Table 1 Characteristics of 172 nursing home residents and 526 controls (patients living at home)

| | Nursing home residents | Patients living at home | P value |
|--|------------------------|-------------------------|----------|
| Mean (SD) age (years) | 85 (7) | 81 (6) | <0.0001* |
| No (%) of women | 132 (77) | 384 (73) | 0.38† |
| Mean (SD) No of current diagnoses | 4.7 (2.2) | 5.1 (2.5) | 0.048* |
| Mean (SD) No of current drugs prescribed | 5.8 (2.9) | 4.9 (3.4) | 0.003* |

*Two sample *t* test.

† χ^2 test.

Table 2 Distribution of quality indicators among 172 nursing home residents compared with 526 controls (patients living at home). Values are numbers (percentages) unless stated otherwise

| | Nursing home residents | Patients living at home | Crude odds ratio | Adjusted odds ratio (95% confidence interval)* | P value |
|---|------------------------|-------------------------|------------------|--|---------|
| Offered flu vaccine | 127/172 (74) | 409/526 (78) | 0.81 | 0.81 (0.53 to 1.26) | 0.36 |
| If diagnosis of coronary artery disease: | | | | | |
| Prescribed aspirin unless contraindicated | 14/20 (70) | 67/112 (60) | 1.57 | 1.84 (0.59 to 5.70) | 0.29 |
| Blood pressure recorded in past 2 years | 17/23 (74) | 122/127 (96) | 0.12 | 0.18 (0.04 to 0.75) | 0.018 |
| Prescribed β blocker after myocardial infarction if not contraindicated | 2/5 (40) | 9/24 (38) | 1.11 | 2.20 (0.17 to 28.00) | 0.54 |
| If diagnosis of hypertension: | | | | | |
| Blood pressure recorded in past year: | 18/34 (53) | 174/204 (85) | 0.20 | 0.20 (0.09 to 0.47) | <0.001 |
| <150/90 mm Hg | 11/18 (61) | 82/180 (46)† | 1.88 | 2.56 (0.88 to 7.47) | 0.09 |
| If diagnosis of diabetes: | | | | | |
| HbA _{1c} recorded in past year | 7/13 (54) | 44/52 (85) | 0.21 | 0.25 (0.06 to 1.13) | 0.07 |
| Blood pressure recorded in past year: | 8/13 (62) | 50/52 (96) | 0.06 | 0.05 (0.01 to 0.38) | 0.004 |
| <140/80 mm Hg | 5/8 (62) | 31/50 (62) | 1.01 | 1.02 (0.22 to 5.89) | 0.87 |
| Offered flu vaccination in current winter | 10/13 (77) | 43/52 (83) | 0.70 | 0.68 (0.13 to 3.45) | 0.64 |
| Offered pneumococcal vaccination | 3/13 (23) | 33/52 (63) | 0.17 | 0.15 (0.03 to 0.70) | 0.02 |
| Screened for hypothyroidism if female and taking antidepressant | 17/38 (45) | 17/46 (37) | 1.38 | 2.18 (0.80 to 5.96) | 0.13 |
| Prescribed thioridazine | 10/172 (6) | 0/526 | 68.04‡ | (4.00 to 1167.51)§ | — |
| Appropriate Read code recorded if prescribed neuroleptic | 33/49 (67) | 51/56 (91) | 0.20 | 0.22 (0.07 to 0.71) | 0.01 |
| Appropriate Read code recorded if prescribed laxative | 35/67 (52) | 58/85 (68) | 0.51 | 0.69 (0.33 to 1.43) | 0.32 |

*Adjusted for age, sex, practice, total number of diagnoses, and total number of drugs prescribed.

† Six results were recorded more than one year previously.

‡ Calculated by Woolf's exact method, by adding 0.5 to the value in each cell of the 2x2 table.

§ Adjusted odds ratio cannot be calculated; 95% confidence interval given is for unadjusted odds ratio.

measured in the past year (0.20, 0.09 to 0.47) (table 2). However, among patients with hypertension who had had their blood pressure measured in the past year, a higher proportion of nursing home residents (61% (11/18)) than of controls (46% (82/180)) had blood pressure <150/90 mm Hg (2.56, 0.88 to 7.47, although this result was of only borderline significance (table 2).

In diabetic patients, recording of HbA_{1c} concentration was worse in the nursing home residents (54% (7/13)) than in the controls (85% (44/52)) (0.25, 0.06 to 1.13), although this result was again of borderline significance; recording of blood pressure was also worse (62% (8/13) v 96% (50/52)) (0.05, 0.01 to 0.38). However, mean (SD) HbA_{1c} concentrations in nursing home residents and controls (0.08 (0.02) v 0.08 (0.01) respectively; P=0.71) were similar, as were the proportions of patients with blood pressure <140/80 mm Hg (table 2). Nursing home residents were less likely than controls to have received or been offered pneumococcal vaccination (0.15, 0.03 to 0.70), but the proportions of patients offered flu vaccine were similar (table 2).

Over a quarter (28% (49/172)) of nursing home residents were taking neuroleptic drugs, a significantly higher proportion than in the controls (11% (56/526); 3.82, 2.37 to 6.17). For patients taking neuroleptic medication, patient records were more likely to contain the appropriate diagnostic Read code if the patients were living at home (91% (51/56) v 67% (33/49) (table 2). Only 10 patients in the whole study were currently being prescribed thioridazine, all of whom were nursing home residents.

Overall, about two fifths (39% (67/172)) of nursing home residents were currently prescribed a laxative, a significantly higher proportion than in the controls (16% (85/526); 2.79, 1.79 to 4.36). For patients prescribed a laxative, there was no difference in the recording of the appropriate Read code between the

nursing home residents and those living at home (table 2).

Discussion

The results of this study suggest that elderly people in one UK city are receiving inadequate care. Inadequate care takes several different forms: insufficient use of beneficial drugs; poor monitoring of chronic disease; and overuse of inappropriate or unnecessary drugs.⁴⁻¹⁰ We have shown that poor monitoring of disease and unnecessary drug prescribing are more likely to occur in nursing home residents than in people living at home, even after comorbidity and amount of prescribed medication are controlled for. These findings are particularly topical in the light of government policy that aims to improve health care for older people.⁶⁻¹¹⁻¹³

Context of other studies

In terms of prescribing beneficial treatment, the low level (38% (95% confidence interval 20% to 58%)) of β blocker prescribing in patients with a history of myocardial infarction is consistent with other studies in the United Kingdom and United States.¹⁴⁻¹⁶ Overall use of β blockers was reported to be higher in a US survey, with half of patients nationally taking β blockers after discharge from hospital, but with substantial variation in different states (range 30% to 77%).¹⁴ In the United Kingdom two recent randomised trials have shown a similarly low level of β blocker prescribing in patients who had had a myocardial infarction.¹⁵⁻¹⁶ Data on secondary prevention in European countries from the EUROASPIRE Group show greater use of β blockers, but these data may not be directly comparable as the study took place in a younger population of patients.¹⁷

In contrast, the overall prescribing of aspirin in coronary heart disease (61%) was lower than in some reports of clinical practice in the United Kingdom

(reported to be in the range of 80-90%),^{15 18} but not in others.¹⁶ In terms of the process of care for chronic disease, nursing home residents fared worse than their counterparts living at home for monitoring both of blood pressure and HbA_{1c} concentration, though the nursing home patients whose blood pressure was recorded seemed to have better control. A previous report highlighted that the level of macrovascular complications was greater in nursing home residents with diabetes than in controls living at home.¹⁹ As the interval between the key process of care and the outcome of macrovascular complications is long, it was not possible in this study to attribute poor outcome to recent clinical care.⁸ This study provides evidence that nursing home residents with diabetes receive poorer care in terms of selected preventive and management interventions.

Our study has also confirmed suggestions of inappropriate drug use in elderly people, particularly those in nursing homes.⁴ The overall level of prescribing of neuroleptic drugs in nursing home residents (28%) was higher than levels reported in a previous survey among nursing home residents in Glasgow.⁵ Use of thioridazine was low, but all the patients who had been prescribed this drug were nursing home residents. Among patients receiving neuroleptic drugs, patient records were less likely to contain the appropriate diagnostic Read code if the patients were living in a nursing home. Lastly, nursing home residents were almost three times as likely to receive a laxative as those living at home. Added to the fact that nursing home residents received on average more drug treatment than those living at home, concerns about overprescription of inappropriate drugs (with the attendant dangers of iatrogenic side effects and “prescribing cascades”) seem more likely in relation to nursing home residents.²⁰

Study limitations

We did not measure other important dimensions of quality, such as access to care and how well health professionals relate to patients, particularly in terms of continuity of care.⁹ We did not examine the temporal relation between the process of care, comorbidity, and prescribing of drugs and did not control for the number of visits to the surgery or home visits to patients. We did not measure how recently a patient had been discharged from hospital, so a proportion of the prescribing in this study could be attributable to hospital doctors rather than general practitioners. A qualitative study design would be more appropriate for exploring elderly patients’ (and their carers’) expectations of care. Elderly people often have several chronic diseases and may prefer to have less suffering and an improved quality of life rather than treatment for every disease they have.^{4 21} Lastly, the findings of this study need to be reproduced in a larger sample of practices, with follow up of patients, so that the outcome of clinical care can be assessed.

Future research

Future studies should continue to focus on the quality of care that elderly patients receive, in terms of clinical care, access to care, and the doctor-patient relationship.⁹ Interventions designed to improve the care of elderly patients in institutions should reflect and assess the different ways in which general practitioners,

What is already known on this topic

Doctors too often prescribe harmful drugs and too seldom prescribe beneficial drugs for elderly people

The quality of medical care for those living in nursing and residential homes has also been questioned

What this study adds

Elderly people in one UK city receive inadequate care when judged against explicit quality indicators

Those living in nursing homes receive poorer care than those living at home in terms of underuse of beneficial drugs, poor monitoring of chronic disease, and overuse of inappropriate or unnecessary drugs

specialists, and nurses deliver this care.¹ Educational interventions aimed at medical staff can have a substantial impact on the prescribing of neuroleptic drugs in patients in nursing homes.²² Other dimensions of care, aside from the prescribing of drugs, are equally relevant to elderly patients. For example, the continuous assessment review and evaluation (CARE) scheme, which focuses on incontinence, management of decubital ulcers, autonomy of the patient, and drug use.²² Lastly, assessment of quality of care should consider the preferences of patients and their carers for drug treatments in terms of both potential benefits²¹ and potential harm.^{20 22} Future research should combine refinements on better ways to measure the quality of care with interventions that are designed to improve the delivery of care to elderly patients.

Conclusion

More sophisticated models of optimal prescribing are needed in elderly people, with due regard to overuse and underuse of drugs. As general practitioners provide most medical care to this vulnerable group, more coordinated models of care are needed to match the needs of these patients.

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Contributors: TF generated the idea, wrote the study protocol, and supervised data collection. JB and JP collected the data. AAM analysed the data with input from TF. All authors contributed to the writing of the study. TF will act as guarantor.

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