An observational study of psychotropic drug use and initiation in older patients resident in their own home or in care

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Abstract

Objective: to compare the prescription of psychotropic medications for patients living in care homes with that for patients living at home.

Design and setting: retrospective population database study in the Tayside region of Scotland.

Subjects: 70,297 patients aged ≥65 and followed until death or the end of the study.

Methods: examining registered addresses for all people aged 65–99 identified those in care. The prescriptions for a 12-week period was examined and psychotropic drug use compared by their place of residence. Comparisons of prescriptions pre- and post-admission were performed for people admitted to a care home from Jan 2005 to Dec 2006.

Results: people living in care (4.1%) received 9.80 more prescribed items \((P < 0.001)\) from 1.63 more British National Formulary (BNF) categories \((P < 0.001)\) than people living at home over a 12-week period. They were more likely to receive any psychotropic medication (42 versus 16%, odds ratio (OR) 3.09, 95% CI: 2.79–3.41).

Over 70% of 1,715 people admitted to care homes during the study who received psychotropic medication commenced the medication prior to admission. Patients who started antipsychotics in the 30 days prior to admission were less likely to have stopped them (OR: 0.53, 95% CI: 0.30–0.94).

Conclusion: prolonged prescription of psychotropic medications is commonplace in care home residents. Almost half of the people prescribed antipsychotic drugs received them for a minimum of 6 months. Systematic medication reviews must be established in all care homes to promote safe and effective prescription to this at-risk population.

Keywords: psychotropics, care homes, prescribing quality, family practice, patient safety, quality of health care, older people
Introduction

The use of psychotropic drugs in older people has long been of concern, particularly in nursing homes, with the reduction in antipsychotic drugs in older people with dementia becoming a key national recommendation across the UK [1]. Psychotropic drugs are those that have an altering effect on the mind, emotions and behaviour, and include drugs where the intended effect is primarily psychotropic (such as antipsychotics or antidepressants) and drugs that have psychotropic side effects (such as anticholinergic drugs). A recent study of Scottish nursing homes reported that three-quarters of all residents received at least one psychotropic medication to manage behavioural symptoms, 71% had dementia and one in three received some antipsychotic medication [2]. One of the report’s key findings was that closer monitoring of prescribing in care homes was required [2]. Recent work from Germany and Austria reported that 52 and 75%, respectively, of residents in long-term care facilities received at least one psychotropic medication [3]. Earlier work from Bergen in Norway had reported that 60% of patients in nursing homes received at least one psychoactive medication on a long-term basis [4]. A study on patients receiving Medicare who were resident in nursing homes in the USA reported 28% receiving antipsychotics, but commented that there seemed to be no relationship between these prescriptions and behavioural symptoms, raising questions relating to the quality of prescription [5].

Research has shown that using atypical antipsychotics in patients with dementia increases their risk of stroke 3-fold and their risk of death by one and a half times [6, 7]. Systematic reviews of medication use as a risk factor for falls reported an increased risk for patients receiving central nervous system drugs, especially psychotropic drugs [8 – 10]. A recent study by the authors reported one in six patients with dementia were currently receiving potentially harmful antipsychotics and the majority of them were receiving medication over a prolonged period [11]. Previous work in Tayside, Scotland, examined potentially inappropriate medications based on the place of residence for over 70,000 older people and found that care home residents were over one and a half times more likely to receive a long-acting benzodiazepine than those in their own home [12].

Older people are at a higher risk of accident and emergency (A&E) attendance and hospital admissions due to adverse drug events (ADEs) because they frequently receive an array of different drugs with overlapping effects [13]. They are also intrinsically physiologically more vulnerable to ADEs because they display both pharmacokinetic vulnerability (especially via decreased renal and hepatic function and via increases in the volume of the distribution of lipid soluble drugs such as diazepam) and pharmacodynamic vulnerability (increased sensitivity to several classes of drugs including psychotropic drugs) [14, 15]. Nursing home residents are frailer than community-dwelling older persons, take more different types of medication which are prescribed more frequently and so are particularly at risk of hospitalisation [16–18]. A national policy transferring responsibility for continuing care between health, social work and the individual has increased the demand from patients within nursing homes on general practitioners (GPs) and led to a concern about medical care for this group of people with high morbidity and disability, especially with regard to medication use [19–23]. A recent Parliamentary report on the health care of older people ‘expressed concern about the inappropriate use of medication in older people, including the over or under-use of medication and the use of medication as a means of controlling patients and residents’ [24].

Identifying and understanding the use of psychotropic drugs in older people whether they are resident in their own homes or in care is a very complex area. The aim of this study was to compare psychotropic prescription for people living at home and in care, with psychotropic medication defined as any hypnotic, anxiolytic, anti-psychotic or anti-depressant medication. For those people admitted to care during the study, a subsequent aim was to examine whether psychotropic drug prescription predated or was commenced after admission. Understanding the patterns of drug initiation is an essential step to subsequently help inform the planning of interventions to improve the quality of prescription to this population with multiple morbidities who are at a high risk of re-admission to the hospital care.

Methods

Identification of study cohort

This study was performed using anonymised health-care data for the population of Tayside, Scotland supplied and managed by the Health Informatics Centre (HIC) of the University of Dundee. Health care in Scotland is provided by the National Health Service (NHS), which is a taxpayer-funded service which is essentially free to patients at the point of care. NHS Tayside consists of a single Health Board that directly provides specialist and hospital care, and contracts for the provision of primary medical care with approximately 70 general practices. These record-linkage databases cover approximately 400,000 individuals and patient data are linked by the use of a community health index number allocated uniquely to all patients when they register with a GP [12].

The data set comprised all patients aged between 66 and 99 years and resident in Tayside on the 1 January 2005 until death or the end of the study period, and is described in detail elsewhere [12]. The registered address of each patient was compared against a list of the region’s nursing, residential care and mixed care home addresses. Nursing homes offer personal care to their residents with the addition of trained nursing care, whereas residential homes only offer personal care (help with washing, dressing etc.). Mixed care homes have a combination of some nursing
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Measurement of prescribing

The number of prescribed items per patient was calculated for the first 12 weeks of the study period, along with the total number of different drug classes, grouped by the British National Formulary (BNF) section (e.g. BNF2.9 anti-platelet drugs). Patients who had died during this 12-week period were excluded from this analysis and the place of residence was taken at the end of the period (25 March 2005). Prescribing records were examined for psychotropic prescriptions based on BNF sections for hypnotics (drugs classed as BNF 4.1.1), anxiolytics (BNF 4.1.2), oral and short-acting parenteral anti-psychotics (BNF 4.2.1), although community dispensing is almost exclusively oral drugs and we refer to this group as oral antipsychotics subsequently), depot anti-psychotics (BNF 4.2.2), tricyclic and related drugs (BNF 4.3.1), selective serotonin reuptake inhibitors (SSRIs BNF 4.3.3) and other antidepressants (BNF 4.3.4) (For the full list of generic drug names, see Supplementary data available in Age and Ageing online, Tables). Prevalences were reported to show whether a patient had received at least one medication from each of these drug groups during the 12-week period.

The first prescription date for each class of psychotropic medication was retrieved. For antipsychotic medications, the duration of use over the 2-year study period was calculated as the interval between the first and last prescription dates in the data set. Patients with a single prescription had the duration set to 30 days as this best reflected the recommended prescription suggested by the BNF.

For the patients admitted to a home during the 2-year study period, the number of patients prescribed each psychotropic medication either pre- or post-admission to residential care was reported. The date of initiation for each psychotropic medication was recorded in relation to their date of death or the end of the study period. Data from all prescriptions encashed in Tayside during the 2-year study period (1 January 2005–31 December 2006) for each patient were obtained along with demographic data including patients’ age and sex.

Statistical methods

Descriptive statistics for age, sex, number of prescriptions and classes of drugs are reported for individuals living at home and in care along with the proportion receiving psychotropic medication. The duration of use for each drug was calculated using the dates of the first and last prescription for each drug type, with patients who received a single prescription assumed to have a 30-day duration.

Results

There were 70,297 people identified aged 65–99 who remained resident in the region and were therefore followed-up until death or the end of the study period. There were a total of 1,790 (39%) deaths in care homes over the entire 2-year period, compared with 5,321 (8%) for people living in their own home ($\chi^2 = 4600$, degrees of freedom (df) = 1, $P < 0.001$). Of these, 69,307 people were still alive on 25 March 2005 when a cross-sectional analysis of prescribing in the previous 12-week period was conducted. There were 2,813 (4.1%) care home residents, who were more likely to be female ($\chi^2 = 267$, df = 1, $P < 0.001$) and older ($\chi^2 = 5100$, df = 3, $P < 0.001$). Care home residents received a significantly greater number of prescribed items [9.80 more, 95% confidence interval (CI) = 9.46–10.15, $P < 0.001$] from more BNF classes (1.63 more classes, 95% CI = 1.50–1.76, $P < 0.001$) in the preceding 12-week period (see Table 1).

Approximately 17% of the over-65 population in the region received at least one psychotropic medication in the 12-week period, with 16% in the community compared with 42% in care. All categories of psychotropic prescription were significantly more common for care home residents (see Table 2), although the prevalence of drug use...

Table 1. Descriptive statistics of patients aged 65 years and older living in Tayside on 25 March 2005, Scotland

<table>
<thead>
<tr>
<th>Age categories, n (%)</th>
<th>At home</th>
<th>In care</th>
</tr>
</thead>
<tbody>
<tr>
<td>65–69</td>
<td>66,494</td>
<td>2,813</td>
</tr>
<tr>
<td>70–74</td>
<td>20,006</td>
<td>179</td>
</tr>
<tr>
<td>75–79</td>
<td>31,272</td>
<td>638</td>
</tr>
<tr>
<td>80–84</td>
<td>13,352</td>
<td>1,328</td>
</tr>
<tr>
<td>85–89</td>
<td>1,864</td>
<td>677</td>
</tr>
<tr>
<td>90–99</td>
<td>38,163</td>
<td>2,051</td>
</tr>
<tr>
<td>Female sex, n (%)</td>
<td>7.19 (7.12–7.25)</td>
<td>15.66 (15.11–16.20)</td>
</tr>
<tr>
<td>Mean no. of items prescribeda</td>
<td>4.02 (3.99–4.04)</td>
<td>5.65 (5.49–5.80)</td>
</tr>
</tbody>
</table>

aRelates to receiving drugs in the previous 12 weeks.
for some classifications was low. Thirteen percent of the care home residents received a hypnotic, 6% an anxiolytic, 17% an oral anti-psychotic, 8% tricyclics and 13% an SSRI, compared with 6, 3, 1, 5 and 4%, respectively, in the community. Females were more likely to receive all medications independently of age and residence status except for depot anti-psychotics. Age was also an independent factor in the prescription of medication for most groups.

The mean duration of use for each drug over the 2-year period was 365 days (95% CI: 359–372) for hypnotics, 234 days (95% CI: 227–241) for anxiolytics, 322 days (95% CI: 313–332) for oral anti-psychotics, 325 days (95% CI: 319–331) for tricyclics and 319 days (95% CI: 312–326) for SSRIs.

The population admitted to a care home during the study period (1,715 people and 3% of total population) was followed for a total 1,724 person years prior to admission (median 375 days, IQR: 179–543 days) and 1,176 person years after (median 206 days, IQR: 65–408 days). In this group, the majority of psychotropic medications were initiated prior to admission (see Supplementary data available in Age and Ageing online, Tables): hypnotics [473 patients in total, 339 (72%) initiated before admission], anxiolytics [343 patients, 240 (70%) before], oral anti-psychotics [500 patients, 362 (72%) before], tricyclics [223 patients, 168 (75%) before] and SSRIs [431 patients, 313 (73%) before].

Further examination of oral anti-psychotic prescription for people admitted to a care home during the study period showed that 60% received medication over a minimum 6-month period and that those started on medication 30 days prior to admission (OR = 0.36, 95% CI: 0.16–0.81, \( P = 0.014 \)) were less likely to have had their medication stopped than those started on medication more than 30 days prior to admission (see Table 3).

**Discussion**

This study identifies a high level of psychotropic prescription for older people living at home and in care homes. Care home residents are much more likely to be prescribed psychotropics but the use of these drugs is also common in the community with one in six people prescribed them over the 2 years. For people admitted to a care home during the study who received psychotropic medications, 70% of this prescribing was initiated prior to admission to the home. People admitted to care homes who were prescribed anti-psychotic medication in the 30 days before admission were less likely to have this medication stopped than other patients in care.

Females were more likely to receive psychotropic drugs than males with the exception of depot anti-psychotics. Older people were more likely to receive hypnotics or oral anti-psychotics. Almost 60% of people prescribed antipsychotics received these drugs for a prolonged period of 6 months or more, and the mean duration of use for other psychotropic drugs over the 2-year period approached 1-year.

The high levels of use of anti-psychotics and other psychotropic drugs especially in care homes are of concern due to worries over their safety. More than one in six care home residents received an oral anti-psychotic, one in eight a hypnotic, the same for SSRIs and one in sixteen an anxiolytic. Oral anti-psychotics have been shown to have little benefit to patients but increase the risk of stroke and death. Psychotropic drug use is significantly higher in care home residents but they would seem to be initiated

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**Table 2. Psychoactive prescribing in the previous 12 weeks by the place of residence on 25 March 2005**

<table>
<thead>
<tr>
<th></th>
<th>At home (n=66,494, %)</th>
<th>In care (n=2,813, %)</th>
<th>OR 95% CI unadjusted</th>
<th>OR 95% CI adjusted for age, sex*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any psychoactive med.</td>
<td>10,275 (15.5)</td>
<td>1,172 (41.7)</td>
<td>3.91 (3.57–4.28)</td>
<td>3.09 (2.79–3.41)</td>
</tr>
<tr>
<td>Hypnotics (BNF 4.1.1)</td>
<td>3,954 (6.0)</td>
<td>372 (13.2)</td>
<td>2.41 (2.12–2.74)</td>
<td>1.52 (1.32–1.74)</td>
</tr>
<tr>
<td>Anxiolytics (BNF 4.1.2)</td>
<td>1,774 (2.7)</td>
<td>181 (6.4)</td>
<td>2.51 (2.10–3.00)</td>
<td>2.26 (1.87–2.74)</td>
</tr>
<tr>
<td>Oral anti-psychotics (BNF 4.2.1)</td>
<td>805 (1.2)</td>
<td>466 (16.6)</td>
<td>16.20 (13.98–18.77)</td>
<td>12.96 (10.73–15.64)</td>
</tr>
<tr>
<td>depot anti-psychotics (BNF 4.2.2)</td>
<td>4 (0.01)</td>
<td>4 (0.1)</td>
<td>23.67 (5.91–94.86)</td>
<td>48.02 (8.78–262.51)</td>
</tr>
<tr>
<td>Tricyclic and related drugs (BNF 4.3.1)</td>
<td>3,427 (5.2)</td>
<td>213 (7.6)</td>
<td>1.51 (1.30–1.75)</td>
<td>1.44 (1.24–1.68)</td>
</tr>
<tr>
<td>SSRIs (BNF 4.3.3)</td>
<td>2,397 (3.6)</td>
<td>371 (13.2)</td>
<td>4.06 (3.63–4.54)</td>
<td>3.65 (3.23–4.13)</td>
</tr>
<tr>
<td>Other antidepressants (BNF 4.3.4)</td>
<td>329 (0.5)</td>
<td>60 (2.1)</td>
<td>4.38 (3.21–5.99)</td>
<td>5.23 (3.72–7.35)</td>
</tr>
</tbody>
</table>

*Female patients were more likely to receive the specified drug in all models except depot anti-psychotics. Younger patients were more likely to receive tricyclics and other anti-depressants. Older patients were more likely to receive any psychoactive medication, hypnotics and oral anti-psychotics.

**Table 3. Anti-psychotic use in patients admitted to care homes**

<table>
<thead>
<tr>
<th></th>
<th>No of patients (%)</th>
<th>Duration ≥180 days (%)</th>
<th>On continuous antipsychotics (%)</th>
<th>OR for stopping antipsychotics adjusted for age and sex OR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Started more than 30 days prior to admission</td>
<td>282 (56)</td>
<td>215 (76)</td>
<td>62 (22)</td>
<td>1.0</td>
</tr>
<tr>
<td>Started within 30 days prior to admission</td>
<td>70 (14)</td>
<td>29 (41)</td>
<td>27 (39)</td>
<td>0.50 (0.28–0.88)</td>
</tr>
<tr>
<td>Started within 30 days after admission</td>
<td>71 (14)</td>
<td>30 (42)</td>
<td>25 (35)</td>
<td>0.53 (0.30–0.94)</td>
</tr>
<tr>
<td>Started more than 30 days after admission</td>
<td>77 (15)</td>
<td>25 (32)</td>
<td>24 (31)</td>
<td>0.73 (0.41–1.30)</td>
</tr>
</tbody>
</table>
primarily before people are admitted. This may be evidence against the belief that initiation is largely driven by care home staff to make residents easier or more convenient to manage [24].

Comparison with the literature

The data in this study show that care home residents receive more prescriptions from a greater number of drug classes than older people resident in the community. The use of psychoactive drugs is high across the entire population of older people but especially in those in residential care. Our data show that 3.7% of the population received an oral anti-psychotic at some stage over a 2-year period. This is higher than the 2% figure for prescribing over a 1-year reported by the authors using a different Scottish practice database but is of a similar order [11]. This study is consistent with the findings of the Mental Welfare's recent visits to care homes in Scotland and the prevalence of psychotropic and anti-psychotic prescription reported within the study is broadly in line with the published literature, although the proportion of residents prescribed anti-psychotics is lower than some recent UK estimates [1, 2, 4, 5, 11].

Strengths and weaknesses of this study

The study examined psychotropic prescription in a defined geographical population, which operates a closed pharmacy system. This will enhance the external validity of our findings as our data are based on actual encashed prescriptions for a complete population. The use of the main health board population database register provides an accurate method to identify patients and ascertain the place of residence based on their address. The date of transfer for people moving from community dwelling to care homes was based on the same data which we would expect to be reasonably accurate. However, 56% of anti-psychotic initiation in older people admitted to care homes over the 2-year period was more than 30 days before admission, and so, even allowing for some delay in recording the change of address, a significant proportion of initiations predate admission. Payment to pharmacists dispensing medication is dependent on the return of the prescription to central NHS Scotland resources. These are then routinely passed to HIC for inclusion in the prescribing data set, which ensures an accurate record of the drugs dispensed to individual patients.

The limitations of the study include the lack of information on clinical indications for prescription of these medications. There is no data on the underlying conditions each person has and so we are unable to examine whether prescriptions are based on clinical need or are for other reasons. The records of dispensed medication do not include the indication of why each medication was started or under whose instruction. It may be that secondary care physicians recommend the use of these drugs and subsequently GPs are reluctant to stop the medication. However, this does not change the fact that the patient is receiving a potentially inappropriate medication.

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The new key finding from the work would seem to be the need for a detailed medication review to highlight drugs that may be discontinued as the reasons for their initiation may no longer be valid. Although the data available do not make it possible to examine the reasons for initiation, or whether prescribing was reviewed after admission to the care home, the findings are compatible with anti-psychotics being used in an attempt to manage a deterioration in the patient until such time a transfer to residential care can be arranged or to allow patients to stay in their current environment and maintain relationships with partners, carers and health-care professionals. However, for patients starting anti-psychotics prior to admission, there seems to be a failure to review the medication once the patient is established within a nursing home. Better understanding of why antipsychotics are initiated but not stopped will require more detailed tracking of patients in a cohort study, either prospective or using retrospective records review.

Conclusions

There is a high level of psychotropic prescription in older people with an increased use of these potentially harmful drugs in care home residents compared with people living in the community. However, the majority of psychotropic drugs are initiated in the community prior to care home admission. Anti-psychotics are used for a prolonged period and further work should investigate where and why drug initiation occurs. However, irrespective of whether initiation is indicated at the time, it is important that medication use in this group is regularly reviewed and active attempts are made to reduce psychotropic prescription to this vulnerable group of people.

Key points

- The use of psychotropic drugs in older people is a major concern especially in nursing homes where their use is high.
- A recent UK Parliamentary report expressed concern that their ‘inappropriate use’ in nursing homes was a ‘means of controlling patients’.
- Approximately one in six older people received at least one psychotropic medication in a 2-year period, and this rose to two in five of nursing home residents.
- The majority of psychotropic drugs used by residents of nursing homes were started prior to admission and their use was prolonged.
- Older people in nursing homes who started a psychotropic drug in the month before admission were less likely to have this stopped than other patients.
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Conflicts of interest

None declared.

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Supplementary data

Supplementary data mentioned in the text is available to subscribers in Age and Aging online.

References


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