An indicator of appropriate neuroleptic prescribing in nursing homes

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Abstract

Objective: to derive and apply objective criteria which assess the appropriateness of neuroleptic prescribing, in a random sample of nursing homes.

Design: cross-sectional survey of prescribing in a random sample of nursing homes.

Setting: 22 homes with more than 35 residents in the former South Thames Region.

Subjects: 934 nursing home residents aged 65 years or over.

Methods: we compared criteria of appropriate neuroleptic prescribing, including appropriate indication and review, to clinical data documented in the nursing and GP notes of residents prescribed neuroleptics.

Results: of the 229 (24.5%) residents prescribed neuroleptics, clinical notes were available for 225. Clinical data indicated that only 40/225 (17.8%) residents receiving neuroleptics received appropriate therapy. The intra-cluster correlations for appropriate and inappropriate prescribing of neuroleptics were 0.038 and 0.12 respectively. It was not possible to derive reference ranges of observed prescribing that included homes demonstrating appropriate prescribing whilst excluding those with inappropriate prescribing. Thus, clinical data are needed whenever neuroleptic appropriateness is assessed. Criteria were readily applicable in nursing homes.

Conclusion: application of criteria of appropriate neuroleptic prescribing in a random sample of nursing homes identified suboptimal prescribing to elderly residents.

Keywords: nursing homes, antipsychotic agents, prescriptions, drug, quality of health care, quality indicators, health care

Introduction

Between 22% and 43% of nursing home residents in the United States and 24%–28% in the UK are prescribed neuroleptics [1–6]. In the nursing home sector, neuroleptics are frequently initiated for behavioural problems associated with dementia, but only about 18% of these patients respond [7]. Elderly patients are particularly prone to the adverse effects of neuroleptics [8]. The risk of falls and hip fractures is enhanced and confusion, cognitive impairment and poor motor performance may be exacerbated [8–11]. Longitudinal studies suggest neuroleptics increase the rate of cognitive decline and development of neurofibrillary tangles [12, 13].

There is evidence of inappropriate neuroleptic prescribing in nursing homes in the US [1–4], but fewer studies have evaluated prescribing appropriateness in UK nursing homes [5].

National consensus criteria, based on published evidence, regulate neuroleptic prescribing in the US nursing homes via the Omnibus Reconciliation Act 1990 (OBRA) [5]. None of the published data since OBRA have lead to the need for re-evaluation of these guidelines. No such regulations are implemented in the UK, although Age Concern has produced similar guidelines [14].

We aimed to:

1. Develop an indicator of appropriate neuroleptic prescribing based on US OBRA guidelines.
2. Use this indicator to assess appropriateness of neuroleptic prescribing in a random sample of nursing homes.
3. Determine whether appropriateness of prescribing correlated with size, location, ownership, size and teaching status of the attending GP practice.

4. Determine whether reference ranges of observed prescribing that provided an indication of appropriateness of prescribing could be derived, thus negating the need to collect clinical data.

**Methods**

We derived criteria of appropriate prescribing from OBRA. Neuroleptic prescription was appropriate for i) psychotic disorders; ii) organic mental syndromes with behaviour presenting danger to the patient, to others or interfering with the provision of care; iii) hiccough, nausea or vomiting (short-term use only) [4]. Inappropriate neuroleptic indications included unspecified aggression, wandering, restlessness, agitation that was not a danger, anxiety and uncooperativeness. Objective and quantitative documentation of behaviour was required, as was attempted dose reduction (or reason why this was not attempted) at least every six months (Figure 1).

**Recruitment of nursing homes**

All nursing homes in the former South Thames Region with 35 beds or more were eligible for inclusion. To help ensure coverage of the full range of homes in the Region, which included inner city, suburban and rural homes, attended by single-handed and group medical practices, we selected one home from each of the 12 Health Authorities at random. We then augmented this sample with 17 homes randomly selected from a pooled list covering all Health Authorities.

We approached home managers by telephone, then sent a standard letter describing the study. We sought approval from the nursing home head office where indicated by home managers. We replaced homes that declined to participate with another randomly selected home. We approached attending GP(s) in a similar manner.

**Data collection**

A senior research pharmacist and a specialist registrar in geriatric and general internal medicine collected data between July 1997 and June 1998. We screened medication administration records of all residents aged 65 years or over and recorded all prescriptions. We then collected clinical data from medical and nursing notes, including neuroleptic indication and prescription review. We examined all sections of nurse- and GP-maintained records. We used scenarios to minimise subjectivity in assessment of appropriate documentation of behaviour, for example ‘hit other residents with stick twice today’ was acceptable documentation but ‘agitated’ was not. We also noted adverse effects potentially attributable to neuroleptic therapy. We assessed nursing home ownership, staffing and fees and general practice size and teaching status in interviews with the nurse in charge and the practice manager.

We used the kappa measure of agreement [15] to assess interrater variability in interpretation of clinical information (designation of appropriateness of prescribing) for 25 residents.

**Data analysis**

We used logistic regression to assess predictors of appropriate and inappropriate prescribing. The independent variables considered – which were all at the level of the nursing home – were ownership (private, corporate, charity), number of beds, location (rural or suburban/urban), ratio of patients to 24-hour-equivalent staff, weekly fees, whether the attendant general practice was a single-handed or a group practice, and whether a training or a non-training practice. We determined significance of effects by estimating a scale parameter to allow for variation between homes (which would lead to a greater variance in rates of prescribing than the binomial model used in logistic regression would otherwise predict). For

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**Figure 1. Algorithm to assess the appropriateness of neuroleptic prescriptions.**

- **Appropriate indications:** a) psychotic disorders; b) organic mental syndromes with behaviour presenting danger to patient, others or interfering with provision of care; c) hiccough, nausea, vomiting (short-term only). Inappropriate indications: unspecified aggression, wandering, restlessness, agitation that is not a danger, anxiety, uncooperative.
- **Number/frequency of episodes.**
- **For example, biting, kicking, screaming.**
the purpose of analysis we considered a resident received appropriate therapy if he or she received one or more appropriate neuroleptic prescriptions and no inappropriate neuroleptic prescriptions, but inappropriate therapy if he or she received any inappropriate neuroleptics. The dependent variables were, respectively, the rates of appropriate and inappropriate prescribing at a home. We used Spearman’s rank correlation to investigate the association between rates of appropriate and rates of inappropriate prescribing at a home. The intracluster correlation can be described as the correlation between the assessments of two individuals in the same ‘cluster’, or a measure of how much variation between clusters there is relative to the overall variation between individuals; here the clusters are nursing homes. It is a useful measure to be able to estimate because it aids in planning research studies in that area. We used analysis of variance to estimate the intra-cluster correlation coefficients for number of drugs prescribed, and appropriate and inappropriate neuroleptic prescribing for a resident (with nursing homes as clusters).

Results

Nursing homes and their attending general practices

We recruited 22 homes: 13 owned by multiples, two run by charities and seven privately owned homes. Capacity varied from 40–120 beds, median 46.5 beds. Fifteen homes were in a suburban location, five rural and two were in urban areas.

The median number of full-time-equivalent doctors in each surgery was 4.5. Six were single-handed general practices. Seven practices participated in GP training schemes. Seven homes or their attending general practitioners declined to participate. Capacity of non-recruited homes was not different from recruited nursing homes as clusters.

Residents

There were 934 nursing home residents aged 65 years or over, median 40.5 elderly residents per home (range 27–87). Residents were 65–105 years old, median 86 years; 74% were female. The median length of nursing home residency to the day of data collection was 1.2 years. Residents were prescribed a mean of 5.1 items, within-unit s.d. 2.7, intracluster correlation 0.079.

Observed neuroleptic prescribing

Two hundred and twenty-nine (24.5%) residents were prescribed a total of 245 neuroleptics. Neuroleptic prescribing ranged from 8%–72% residents between homes. Thioridazine (125, 51.0% of prescriptions), haloperidol (41, 16.7%), and chlorpromazine (18, 7.3%) were the most frequently prescribed neuroleptics. Atypical neuroleptics were infrequently used (7 risperidone, 2 olanzepine, 3.7% of prescriptions). Fifty-three neuroleptic prescriptions could be given ‘as required’, of which 12 (23%) had no maximum frequency of administration, permitting unlimited administration. When regular neuroleptic doses were converted to an equivalent chlorpromazine dose [16, 17], the median dose was equivalent to 36 mg chlorpromazine/day.

Neuroleptic appropriateness indicator

Appropriateness of neuroleptic prescribing

We obtained clinical data for 234 (95.5%) neuroleptic prescriptions, prescribed to 225 (24.1%) residents. Data collected indicated 106/234 (45.3%) prescriptions for neuroleptics were initiated before nursing home admission. An appropriate indication was documented for 89/234 (38.0%) neuroleptics. Only 42/89 (47%) prescriptions had been reviewed within the past six months and thus were appropriate. Some patients were prescribed more than one neuroleptic; in all only 40/225 (17.8%) residents were prescribed neuroleptics appropriately. The overall appropriateness of 14/234 (6.0%) neuroleptics could not be confirmed, usually when we felt we had not viewed all clinical notes on the patient.

Most prescriptions were inappropriate for more than one reason: i) inappropriate indication: 145/234 (62%); ii) indication not objectively documented: 141/234 (60.3%); iii) indication not quantitatively documented: 159/234 (67.9%); iv) dose reduction not attempted: 159/234 (67.9%). Indications were poorly documented in both nursing and medical notes.

The proportion of all residents appropriately prescribed neuroleptics varied between homes, from no residents (0%) to 16% in unit A (Figure 2). A strong correlation between observed NL prescribing and inappropriate NL prescribing was noted (r = 0.94, P < 0.01) (Figure 2). A weaker, but still significant, correlation was also seen between observed NL prescribing and appropriate NL prescribing (r = 0.47, P < 0.05). There was no significant correlation between the proportions of patients at a nursing home who were appropriately and inappropriately prescribed neuroleptics (Spearman rank correlation = 0.10).

The intra-cluster correlation for appropriate prescribing of neuroleptics was 0.038, and for inappropriate prescribing was 0.12.
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Interrater agreement was 24/25, kappa 0.65, indicating good agreement.

Determinants of appropriate prescribing

None of the characteristics of homes or their attending general practices investigated were significantly related either to appropriate or inappropriate prescribing. However, carrying out this analysis at what was effectively the level of the nursing home meant that 95% confidence intervals for odds ratios were wide, with typically a 10-fold difference between upper and lower limits.

It was not possible to derive a reference range of observed prescribing that included nursing homes with appropriate prescribing whilst excluding homes with inappropriate prescribing. As previously experienced, this was due to wide casemix variation between units [18]. Symptoms potentially attributable to neuroleptic adverse effects were recorded in the clinical notes of 134/225 (60.0%) residents, including parkinsonism and hypotension developing after neuroleptics were started.

Discussion

This is the first objective evaluation of the appropriateness of neuroleptic prescribing in a randomly selected sample of UK nursing homes. Nursing homes in a range of locations, from deprived inner city to rural areas were recruited. Almost a quarter of elderly residents received neuroleptics, the majority of which were inappropriate. These patients were at unnecessary risk of adverse effects.

These results concur with a survey of 28 non-randomly selected nursing homes in south Glasgow [5]. In that study, 24% residents received regular neuroleptics, of which 88% prescriptions were inappropriate and only 3% residents received neuroleptics appropriately. At the time, the results were not felt to represent the quality of neuroleptic prescribing nation-wide. A survey in Northern Ireland of over 1000 elderly patients in a variety of settings, including 347 nursing home residents, found 28% received neuroleptics [19]. Observed neuroleptic prescribing varied widely in both Northern Ireland and our study; however clinical data collected in our study found appropriate neuroleptic prescribing was similar between homes.

A minority of patients with problem behaviour associated with dementia improve with neuroleptics, and the data available do not allow prediction of likely responders. In the absence of such information, clear documentation of the nature and frequency of behaviour is essential to assess drug effect [14]. This is not a new concept – documentation and review of medication indications will always underlie good clinical practice, now highlighted by the concept of clinical governance.

Notes-based prescribing assessment may in part reflect the quality of documentation and not just appropriateness of therapeutic choice, but the importance of documentation when using a drug class with a low response rate weakens this argument. Further, McGrath et al. used very similar criteria but did not rely on written records for data collection, and found similar results [5]. We acknowledge that adverse effects may be incompletely documented in clinical notes; thus 60% may be an underestimate. The neuroleptic dose was not considered, as the key issue was appropriateness. Only objective documentation of an appropriate indication (aggression was not acceptable but biting and hitting others was) recording the frequency of the behaviour and appropriate review were considered. Although OBRA was first published in 1990s the evidence for neuroleptics in problem behaviours has not changed significantly since: a minority of patients respond, the size of the response is limited and it is not possible to predict which patients will respond. The UK Age Concern guidelines also take this approach.

The choice of six months for review in the OBRA guidelines was largely unsupported by data but there is no doubt that clinically drug requirement does change over this sort of time scale in patients with neuropsychiatric manifestations of dementia.

We excluded homes with a capacity of less than 35 purely for reasons of efficiency. No evidence of a difference in prescribing quality with nursing home size was found. Homes gave several reasons for declining participation, including concerns about patient confidentiality and lack of time, despite our emphasis on collecting data ourselves and adhering to the Data Protection Act. We felt one declining home was unaccustomed to external scrutiny. Other homes expressed similar concerns but did agree to participate and the demographics of declining and accepting homes was similar. We therefore feel the likelihood of participation bias is small. Although this work was conducted before the recent UK Committee on Safety of Medicines restrictions on thioridazine indications [20], it highlights the extensive use of thioridazine (just over half neuroleptic prescriptions) and other neuroleptics in the nursing home setting. Interestingly, in Northern Ireland and Glasgow thioridazine represented over 70% of neuroleptics.

The inability to define a reference range for appropriate prescribing and lack of determinants of appropriate prescribing indicates that the only way to assess appropriateness of prescribing neuroleptics is to collect clinical data.

Before pharmacotherapy is considered for elderly patients with problem behaviour, physical causes, behavioural modification and environmental changes should be explored [1, 21]. Neuroleptics should be reviewed regularly, and gradually withdrawn when the indication is inappropriate or unclear. Neuroleptics can be withdrawn in up to half recipients with no deterioration or an improvement in resident cognition, memory, behaviour and staff stress [2–4, 22, 23].
Conclusion

Objective, quick and simple-to-use criteria of appropriate neuroleptic prescribing have been successfully derived from US OBRA criteria and applied in a UK nursing home setting. Application in a random sample of homes, in inner city, rural and urban locations found a significant proportion of nursing home residents receive neuroleptics inappropriately. Nursing home and GP characteristics did not predict prescribing appropriateness. It was not possible to derive a reference range of observed prescribing that provided an indication of appropriateness of prescribing.

Key points

- Behavioural problems in dementia rarely improve significantly with neuroleptics.
- Neuroleptics are widely used in the nursing home setting.
- The vast majority of neuroleptic prescribing in UK nursing homes is suboptimal. These drugs are used for inappropriate indications and documentation of reasons for starting therapy is poor. Ongoing need for neuroleptics is inadequately reviewed.
- The American OBRA guidelines are suitable for use in the UK and can provide an objective measure of prescribing quality.

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References


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Neuroleptic appropriateness indicator