

Medication use in residential care

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ABSTRACT

Aim

To describe medication use and the recording of diagnoses in residential care.

Methods

Use of medication and frequency of diagnoses was established by medication charting and medical record audit during a survey of a cohort of residents in long-term care facilities. Six hundred and six residents in 14 randomly selected facilities in Auckland, New Zealand in 1999–2000 contributed data.

Results

Forty-six per cent of residents took psychotropic medication and 55% took cardiovascular medication. Use of

aspirin was present in 59% of those listed as having a large vessel event and 74% of those listed as having cardiovascular disease were on some cardiovascular medication. Major tranquillisers were used by 17% of the sample with the majority use noted in those with a diagnosis of dementia.

Implication

Medication use in residential care is complex. This report forms a perspective of prescribing in the late 90s. Further research is needed specifically designed for evaluation of medications in residential care. Reasons for not using aspirin in this population could be reviewed.

(*NZFP 2005; 32: 251–255*)

Introduction

The most common intervention experienced by older people, especially those living in residential care, is the use of medications. It is well known that older people consume more drugs and experience more adverse reactions as a result.

Adverse drug reactions are related to the number of drugs concurrently used. A steady increase in the likelihood of adverse reaction is reported in a population of patients discharged from a medical ward.¹ Between 10 and 23 per cent of older people will experience an adverse drug reaction, 75 per cent of whom will present to their doctor about it.^{2,3} High medication use is, of course, related to severity and complexity of illness and while the total number of medications is important, the type and choice of medication are both related to drug interactions. Drugs of particular interest, associated with

falls and other adverse events, include psychotropic medications.⁴

Medication use in residential care is higher than in community samples and harmful combinations have been identified in up to 11% of residents in one Australian study.^{5,6} Legislation in the USA regulates use of certain medications in residential care and changes in rates of use have been seen as a result.^{7,8} This focus on what not to prescribe, while easy to regulate, does not allow for emphasis on what to prescribe, or underutilisation of medications. The Australian approach to quality use of medication has been to develop a National Strategy.⁹ Part of the strategy has seen projects to provide medication reviews in residential care and development of guidelines.¹⁰ In New Zealand, Medsafe and PHARMAC provide general information about quality use of medications and BPAC provides active education about medications, but there

has not been a focus on residential care, nor the complexities of prescribing in older people.

In addition, underuse of medications has been a growing debate.^{11,12} In New Zealand, little is known about prescribing in residential care, whether medications are appropriately used, overused or underused.

We take the opportunity of having recruited a cohort of residents in Auckland residential care^{13,14} to examine the use of medications in that context. The purpose of this article is to describe medication use and diagnoses in the residential care setting.

Methods

Fourteen residential care homes in Auckland, New Zealand, were selected at random from the Ministry of Health's list of all accredited facilities. Two large complexes containing private hospital beds, rest home beds and dementia specific beds, four

Table 1. Demographics and use of medications in a sample of residential care patients.

Medication	Private hospital residents N = 221	Dementia units residents N = 62	Rest home residents N = 323	Total N = 606
Age in years, mean (SD)	81.6 (14.4)	82.6 (8.4)	84.5 (8.1)	83.3 (10.5)
Male	51 (28%)	32 (34%)	89 (27%)	172 (28.4%)
* Total number of diagnoses m SD)	5.11 (2.1%)	4.37 (2.0%)	4.70 (2.0%)	4.82 (2.07%)
Total number of medications m (SD)	5.88 (3.2%)	4.97 (2.5%)	5.63 (3.1%)	5.65 (3.09%)
Any psychotropic medication	91 (41%)	36 (58%)	154 (48%)	281 (46%)
Antidepressants	38 (17%)	9 (14%)	80 (25%)	127 (21%)
Benzodiazepines Short acting	42 (19%)	12 (19%)	88 (27%)	142 (23%)
Benzodiazepines Long acting	25 (11%)	7 (11%)	29 (9%)	61 (10%)
Major tranquillisers	43 (19%)	27 (44%)	35 (11%)	105 (17%)
Opioids	19 (9%)	3 (5%)	17 (5%)	39 (6%)
NSAIDS	6 (3%)	1 (2%)	20 (6%)	27 (4%)
Any cardiovascular drug	95 (42%)	22 (35%)	214 (66%)	331 (55%)
ACE inhibitor	40 (18%)	3 (5%)	103 (32%)	146 (24%)
Calcium channel blocker	14 (6%)	2 (3%)	34 (11%)	50 (8%)
Beta Blocker	8 (4%)	0 (0%)	47 (15%)	55 (9%)
Diuretic	59 (27%)	18 (29%)	132 (41%)	209 (34%)
Aspirin	76 (34%)	20 (32%)	143 (44%)	239 (39%)

* Diagnoses as listed in the medical chart

M = mean, SD = standard deviation, RN = registered nurse

private hospitals and eight rest homes were recruited and enrolled in 1999–2000. All residents were approached and offered participation in a trial of a falls prevention programme^{13,14} and 650 (97%) agreed to participate and were enrolled.

Data acquisition

Demographic information and diagnoses of medical conditions was recorded from the medical record by research staff. Medication use was recorded directly from the medication orders in the homes. Diagnoses were coded into the most common diagnoses occurring in residents in residential care. Only those diagnoses available from the summaries in the

records were included. Hospital summaries and other documents were not audited. Medication lists were viewed by the author (NK) and coded into specific groups according to their class, using a standard coding sheet and the *New Ethical* catalogue. All diagnoses were recorded. All prescribed drugs were recorded and only those medications related to falls were coded into categories. The medication total represents all drugs used.

Analysis

Descriptive statistics and SPSS and Stata were used to describe the sample, frequency of use of medications and frequency of recorded diagnoses. For selected diagnoses and medica-

tions felt to be appropriate for use in treating that diagnosis, cross tabulations were generated to establish the frequency of treatment specific diagnosis.

Results

Data were available for analysis on 606 residents. Forty residents were enrolled in the trial without medical record review being completed and four died before the trial began. The majority of enrolled residents were women, with only 28% men. The residents' ages ranged from 19 to 104 years with 28 (5%) being younger than 65 years. These younger residents mainly lived in one unit for young disabled persons.

Table 1 shows the use of medications and diagnoses. The use of medications varied according to the level of care of the homes. The average number of diagnoses recorded from the file was 4.8 (SD 2.1) and average number of medications was 5.7 (SD 3.1). Overall 46% were receiving a psychotropic medication, 55% a cardiovascular drug and 39% aspirin.

Table 2a shows that 23% of residents with arthritis received a non-steroidal anti-inflammatory drug (NSAID) or an opioid. Table 2b shows that 75% of those with a recorded cardiovascular disease were receiving a cardiovascular (CV) drug. Also, 35% of those without a CV disease recorded were receiving a CV drug.

Table 2c shows that 59% of those recorded as having a major vessel condition were receiving aspirin. A minority of other residents (23%) were also receiving aspirin.

Table 2d shows that 25% of those with a diagnosis of dementia were receiving major tranquillisers, and 10% of those without this diagnosis recorded were also receiving major tranquillisers.

Discussion

This study shows that, overall, residents were receiving 5.6 prescribed medications. Almost a half of residents were using some type of psychotropic drug (46%). Use of major tranquillisers was highest in dementia units and between 11 and 19% received a major tranquilliser in mainstream care. These rates are similar to rates in other nations in non-specialised units¹⁵ suggesting appropriate use of medications. The concordance with a diagnosis of dementia was high for major tranquilliser with only 10% of those receiving a major tranquilliser not having dementia recorded as a diagnosis.

We are confident that this is a representative sample of residential care homes as the homes were selected at random. Whether this is a representative sample of residents is unknown as the size of homes varied, and the overall number of homes was

Table 2

a. Pain medication and listed as having arthritis

	Arthritis	No arthritis	Total
NSAID or Opioid	28 (23%)	37 (8%)	65 (11%)
No NSAID or Opioid	96 (77%)	445 (92%)	541 (89%)
TOTAL	482 (100%)	124 (100%)	606 (100%)

NSAID = non-steroidal anti-inflammatory drug

b. Cardiovascular (CV) medication and listed as having any cardiovascular diagnosis

	CV disease	No CV disease	Total
Any cardiovascular drug	245 (74%)	97 (35%)	65 (56%)
No cardiovascular drug	86 (25%)	178 (65%)	264 (44%)
TOTAL	331 (100%)	275 (100%)	606 (100%)

c. Aspirin and atherosclerotic disease (CVA or IHD)

	Large vessel disease	No large vessel disease	Total
Aspirin	165 (59%)	74 (23%)	239 (39%)
No aspirin	117 (41%)	250 (77%)	367 (61%)
TOTAL	324 (100%)	282 (100%)	606 (100%)

CVA = cerebrovascular accident, IHD = ischaemic heart disease

d. Major tranquillisers and listed as having dementia

	Dementia	No dementia	Total
Major tranquillisers	76 (25%)	29 (10%)	105 (17%)
No major tranquillisers	227 (74%)	274 (90%)	501 (83%)
TOTAL	303 (100%)	303 (100%)	606 (100%)

small (14). Residents within homes are more like other residents in that home than other residents in the sample as a whole. The sample contained two large homes and, as prescribing practices vary according to organisation within the homes, the overall representativeness of the sample could have been influenced. It is reassuring that there was a very high response rate among residents (97%).

Short acting sedatives were commonly used; the highest rates observed were in the rest home population where about a quarter of residents used them. These rates are similar to community samples of older people,¹⁶ suggesting that the balance between resident (and staff in this case) need and prescriber need to avoid side effects is a dynamic process. Older people in

rest homes are at higher risk of falls than those in the community, however cognition is reasonable and complaints of sleep problems are common and difficult to treat.¹⁷

NSAIDs were rarely prescribed in this study. We did not record the use of paracetamol although it is presumed that many residents are receiving this form of pain relief. Pain management in residential care is difficult as the prevalence of cognitive impairment is high and accuracy of pain measurement uncertain.

Cardiovascular disease is very common in this population and it is surprising that aspirin is not used more frequently. Of those listed as having had a large vessel event, 41% were not on aspirin. Low use of aspirin in situations where it would normally be

indicated is not uncommon. In addition, 25% of those listed as having any cardiovascular disease received no cardiovascular drugs and 35% of those listed as having no CV disease were receiving a drug. This is most likely due to inaccuracy in the recording of diagnoses but more information is needed than that available in this study to make that judgement.

Limitations

This study was not designed to study medication use, but to conduct a falls prevention trial. We have confidence in the accuracy of the data on medications prescribed as they were taken from the dispensing sheets in the homes, however the accuracy of the lists of diagnoses in the files is unknown. The comprehensiveness of the diagnoses listed in the summaries was variable, with some listing one to two diagnoses only and others listing many more. Some GPs also kept medical records on residents at their office and these may have been a better source of information.

We can make no claim as to the quality of prescribing in this study

as the accuracy of the notes to represent diagnostic states is unknown. Most of the residents in this study had multiple diagnoses. Use of medications in these types of residents can be complicated by the impact of intercurrent diseases and pharmacokinetic changes associated with ageing.^{15,18,19} Improved prescribing may be facilitated by accurate records about diagnoses.

Although there is a strategy promoting quality medication use and PHARMAC, Medsafe and BPACnz provide information on quality prescribing, there is little focus on residential care. Perhaps, even in New Zealand, we should think about some more formal way to improve the quality of medication use in this setting. Even though OBRA (Omnibus Budget Reconciliation Act, 1987) legislature in the USA appears to have impacted quality medication use,²⁰ we need more research in our local setting before embarking on the use of prohibitive barriers to prescribing or restrictive criteria for medication use.²¹ Knowledge of the individual patient and the individual's previous experience with medications means that the GP remains the optimal

prescriber. Continuity of care through the residential care journey will be important to quality prescribing. Projects, with good evaluation, investigating additional expertise and upskilling in areas of complex medical and pharmacological management are needed.

In conclusion

Medication use in residential care is complex. This report forms a perspective of prescribing in the late 90s. Further research, specifically designed for evaluation of medications in residential care is needed. Reasons for not using aspirin in this population could be reviewed.

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References

- Williamson J and Chopin J. Adverse reactions to prescribed drugs in the elderly: a multicentre investigation. *Age and Ageing* 1980; 9: 73–80.
- Chrischilles E, Segar E and Wallace R. Self-reported adverse drug reactions and related resource use. A study of community-dwelling persons 65 years of age and older. *Annals of Internal Medicine* 1992; 117: 691–2.
- Johnson J and Bootman J. Drug-related morbidity and mortality. *Archives of Internal Medicine* 1995; 155: 1951–4.
- Ebly E, Hogan D and Fung T. Potential adverse outcomes of psychotropic and narcotic drug use in Canadian seniors. *Journal of Clinical Epidemiology* 1997; 50: 857–63.
- Mant A. Medication used by elderly patients. *Australian Family Physician* 1986; 15: 192–3.
- Mant A et al. Use of medications by the elderly. *Australian Family Physician* 1992; 21.
- Health Care Financing Administration (HCFA), State Operations Manual. 1995, Health Care Financing Administration: Baltimore.
- Rovner B et al. The impact of antipsychotic drug regulations on psychotropic prescribing practices in nursing homes. *Am J Psychiatry* 1992; 149: 1390–1392.
- Ageing, C.D.o.H.a., The national strategy for quality use of medicines. Canberra: Commonwealth Department of Health and Ageing; 2002.
- Australian Pharmaceutical Advisory Council, Guidelines for medication management in residential aged care facilities. 3rd ed. Canberra: Commonwealth Department of Health and Ageing; 2002.
- Gambassi G et al. Management of heart failure among very old individuals living in long-term care: has the voice of trials spread? *Am Heart J* 2000; 139: 85–93.
- Brown M, Lapane K and Luisi A. The management of depression in elderly nursing home residents. *J Am Geriatr Soc* 2002; 50: 69–76.
- Kerse N et al. Fall prevention in residential care: A cluster, randomized, controlled trial. *Journal of the American Geriatrics Society* 2004; 52: 524–531.
- Kerse N et al. Wearing slippers, falls and injury in residential care. *Australian & New Zealand Journal of Public Health* 2004; 28: 180–7.
- Lindesay J, Matthews R and Jagger C. Factors associated with antipsychotic drug use in residential care: changes between 1990 and 1997. *International Journal of Geriatric Psychiatry* 2003; 18: 511–9.
- Hogan DB et al. Prevalence and potential consequences of benzodiazepine use in senior citizens: results from the Canadian Study of Health and Aging. *Canadian Journal of Clinical Pharmacology* 2003; 10: 72–7.
- Scott, M.A., S. Stigleman, and D. Cravens, Clinical inquiries. What is the best hypnotic for use in the elderly? *Journal of Family Practice* 2003; 52: 976–8.
- Leibovici MM. Patient management and use of medication in long-term care. *Health Care Management* 1997; 3: 77–86.
- LeSage J. Polypharmacy in geriatric patients. *Nursing Clinics of North America* 1991; 21: 273–90.
- Stoudemire A and Smith D. OBRA regulations and the use of psychotropic drugs in long-term care facilities. Impact and implications for geropsychiatric care. *Gen Hosp Psych* 1996; 18: 77–94.
- Fick DM et al. Updating the Beers criteria for potentially inappropriate medication use in older adults: results of a US consensus panel of experts. *Archives of Internal Medicine* 2003; 163: 2716–24.