Singapore Med J 2003 Vol 44(12) : 625-629

Prescribing Psychoactive Medications in Nursing Homes: Current Practice in Singapore

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ABSTRACT

Aim: To assess the prescribing practice, use and potential adverse effects of psychoactive medications in Singapore nursing homes.

Method: From a list of existing 24 voluntary welfare organisation (VWO) run nursing homes, four homes with the largest bed capacity were selected from the eastern zone of Singapore. When contacted, two homes agreed to participate in the study. Medical records of all residents aged 65 years and above were reviewed to obtain demographic information, clinical diagnoses and medication orders. Two geriatricians and one psychogeriatrician reviewed the psychoactive medications used in these nursing homes.

Result: A Total of 384 residents were enrolled in the study. Mean age of the participants was 79.1 years (65-107); 60.7% were female and 92.4% were Chinese. Dementia was documented for 131 (34.1%) residents, depression for 50 (13%) residents. Residents were on an average of 5.2 (0-14) medications. A total of 309 psychoactive medications were prescribed for the residents. Fifty-nine (63%) antipsychotics, 42 (65%) Benzodiazepines, 65 (61%) antidepressants, 10 (77%) others sedatives and 31 (100%) anticonvulsants were deemed inappropriate. Lack of documented indication, potential adverse drug reaction, drug-drug interaction and therapeutic duplication were the most common medication related problems observed in this study.

Conclusion: Majority of the nursing home residents were on psychoactive medications. Residents with dementia were more likely to be on psychoactive medications. Statistically significant association was observed between the use of inappropriate psychoactive medications and the diagnosis of dementia. Better documentation of clinical diagnoses and indications, and regular medication review for potential adverse drug reactions would improve the quality of care in Singapore nursing homes.

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Keywords: psychoactive medications, nursing home, current practice, elderly, Singapore

Singapore Med J 2003 Vol 44(12):625-629

INTRODUCTION

The nursing home residents are the frailest segment of the elderly population. They usually suffer from multiple medical and psychiatric problems leading to polypharmacy. Every year, more than 1.5 million Americans receive nursing home care and the number of beds committed to nursing home care in the US exceeds the number of beds in acute care hospital[1]. Several studies showed that nursing home residents in the US use on average six to seven medications with 20% resident using 10 or more medications[2,3]. Due to the changes in drug metabolism with ageing, elderly patients are more vulnerable to the adverse effects of the psychoactive medications[4]. Several studies showed the association between fall and hip fracture with use of various psychoactive medications[5,6]. One study showed that over half the resident of a group of nursing homes in North America were receiving psychoactive medications concurrently[7]. Ray et al in a recent study found that 42% patients of Tennessee nursing homes were on antipsychotic medications[8].

Like other industrialised countries, the segment of the population in the geriatric age group is growing faster than any other age groups in Singapore. In year 2000, people of the geriatric age group made up 7.2% of the total population, and they are expected to make 18.4% of the population in year 2030[9]. Unlike other developed countries, data on medication usage in Singapore nursing homes in general and psychoactive medications in particular are not widely available yet. The ideal place for care of an elderly should be his or her own home. But multiple medical problems, and functional and cognitive decline may create a significant burden for family members and loved ones. Various medical, psychiatric and socio-economic factors lead to the placement of the elderly people in nursing homes. There are currently 49 nursing homes in Singapore with 5,680 beds[10]. It is expected that the frail elderly

residents would receive the highest quality of care in local nursing homes.

Use of psychoactive medications is considered a quality indicator for care in the nursing homes. Though nursing homes are playing an important role in providing care for the elderly, no data are currently available on the use of psychoactive medications in Singapore nursing homes. A study was planned to assess the prescribing practice, use and potential adverse effect of the psychoactive medications in Singapore nursing homes.

METHODS

From the list of 24 VWO nursing homes, four homes with the largest bed capacity were selected from the eastern zone of Singapore. When contacted, two homes agreed to participate in the study. The medical records of all residents aged 65 years and above were reviewed to obtain demographic information, clinical diagnoses and medication orders.

Psychoactive medications were classified as:

1. Antipsychotics
2. Benzodiazepines
3. Antidepressants
   - SSRIs (selective selective serotonin reuptake inhibitor)
   - Tricyclics
   - Other antidepressants
4. Other sedatives/hypnotics
5. Anticonvulsants (in patients with no seizure history)

In a medical record review, the following aspects of the psychoactive medications were evaluated:

1. Dose: dose of the medications were assessed for suitability in the elderly patients in geriatric age group.
2. Duration of treatment: need to continue the medication after the targeted disease is completely treated.
3. Toxicity or adverse drug reaction (ADR): according to the World Health Organization (WHO), adverse drug reaction is defined as "a response to a medicine which is noxious and unintended, and which occurs at doses normally used in man". Only the documented adverse drug reactions were included in the study.
4. Therapeutic duplication: use of multiple medications for single indication with identical therapeutic effect.
5. Contraindication: medications that are contraindicated for existing disease condition of a patient.
6. Drug interaction: use of multiple medications which can potentially interact to produce injurious effect to health.
7. No documented indication: use of medications with no documented diagnoses in the case note.
8. Others: any other medication related problems not mentioned above.

Table I. Demographic information of the study population.

Age	Mean 79.1 years (65-107)
Sex	
Male	151 (39.3%)
Female	233 (60.7%)
Race	
Chinese	355 (92.4%)
Malay	21 (5.5%)
Indian	4 (1%)
Others	4 (1%)
Functional category	
Cat-I	0
Cat-II	56 (14.6%)
Cat-III	206 (53.6%)
Cat-IV	122 (31.8%)
Dementia	
Present	131 (34.1%)
Absent	253 (65.9%)
Total meds	309 Mean 5.2 (0-14)

One geriatrician did the initial assessment and made a list of all inappropriate medications along with the reasons why the medications were deemed inappropriate. Two geriatricians and one psychogeriatrician later reviewed the listed medications and tried to reach a consensus on their inappropriateness. In case of disagreement the psychogeriatrician made the final decision.

Health Care Financing Administration (HCFA) is a US federal government agency that runs Medicare and Medicaid programmes. Medicare is a health care benefit programme for the elderly age ≥65 years; it pays for acute, sub-acute and outpatient cares for the elderly. HCFA and the US state governments jointly run Medicaid programme; it pays long-term care of the elderly in nursing homes. Since year 2001, HCFA is known as Centers for Medicare & Medicaid Services (CMS). For the purpose of this study, the HCFA Guideline for Unnecessary Drugs in Long-Term Care Facilities initiated by 1987 OBRA* regulation[11] and the Geriatric Dosage Handbook[12] were used as standard references. The data were analysed by SPSS 10.0 programme.

RESULT

Out of a total of 467 residents of the two nursing homes, 83 were excluded as they were below the geriatric age group, and 384 residents were enrolled in the study. Table I shows the demographic information of the participants.

Table II. Use of psychoactive medication in the study population.

	Dementia		Functional category			Total meds (N=309)
	Yes	No	Cat-II	Cat-III	Cat-IV	
Antipsych	42 (45%)	51 (55%)	14 (15%)	46 (49%)	33 (35%)	93
Benzo	26 (40%)	39 (60%)	5 (8%)	37 (57%)	23 (35%)	65
Antidep	38 (35%)	69 (64%)	5 (5%)	70 (65%)	32 (30%)	107
Other sed	3 (23%)	10 (77%)	1 (8%)	7 (54%)	5 (38%)	13
Anticon	13 (42%)	18 (58%)	4 (13%)	15 (48%)	12 (39%)	31

Antipsych = antipsychotics, Benzo = Benzodiazepines, Antidep = antidepressants, Other sed = other sedatives, Anticon = anticonvulsants

Table III. Use of inappropriate psychoactive medication in the study population.

Medication	Dementia		Functional category			Total meds (N=207)
	Yes	No	Cat-II	Cat-III	Cat-IV	
Antipsych	34 (58%)	25 (42%)	4 (7%)	32 (54%)	23 (39%)	59
Benso	14 (33%)	28 (67%)	3 (7%)	25 (59%)	14 (33%)	42
Antidep	24 (37%)	41 (63%)	4 (6%)	41 (63%)	20 (31%)	65
Other sed	2 (20%)	8 (80%)	1 (10%)	6 (60%)	3 (30%)	10
Anticon	13 (42%)	18 (58%)	4 (13%)	15 (48%)	12 (39%)	31

Antipsych = antipsychotics, Benzo = Benzodiazepines, Antidep = antidepressants, Other sed = other sedatives, Anticon = anticonvulsants

Table IV. Potential prescription related problems observed.

Medication	Problem categories					Total no of problems
	I	II	III	IV	V	
Antipsychotics	1	7	4	0	47	59 (26%)
Benzodiazepines	1	11	5	2	23	42 (18%)
Antidepressants	0	0	2	1	62	65 (28%)
Other sedatives	0	4	0	1	5	10 (4%)
Anticonvulsants	0	4	1	19	31	55 (24%)
Total no of problems	2	26	12	23	168	231 (100%)

Problem categories I: Dose; II: Adverse drug reaction; III: Therapeutic duplication; IV: Drug interaction; and V: No documented indication

Dementia was documented for 131 (34.1%) residents, depression for 50 (13%) residents; Schizophrenia, agitation or behaviour disturbance and others psychiatric problems were noted for 36 (9.4%), 8 (2.1%) and 7 (1.8%) residents respectively.

Residents were on an average of 5.2 (0-14) medications. A total of 309 psychoactive medications were prescribed, of which 93 were antipsychotics, 65 were Benzodiazepines, 107 were antidepressants, 13 were other sedatives and 31 were anticonvulsants prescribed to patients with no history of seizures. Table II shows the distribution of these medications on the basis of dementia and functional category.

Of the 93 residents on antipsychotics, 37 were also on Benzodiazepines, three were on other sedatives, 32 were on antidepressants and 19 were on anticonvulsants with no seizure history.

One hundred and seven residents were on various antidepressants, 104 were on SSRIs, one on tricyclic and other types of antidepressants. Of the 41 residents on anticonvulsant medications, only 10 had diagnosis of epilepsy. For 31 residents who did not have any diagnosis of epilepsy or any other seizure disorders, Valproate was prescribed for 26 residents; Phenytoin and Carbamazepine were prescribed for two and three residents respectively.

Statistically significant association was observed between the use of psychoactive medications and the diagnosis of dementia (p=0.013, Pearson Chi-Square test). The majority of these residents on psychoactive

medications were in functional category III**. But the category III functional status had no statistically significant association with psychoactive medication use in the nursing homes.

Two hundred and seven (67%) psychoactive medications were deemed inappropriate either due to lack of documented indication, adverse reaction, drug interaction, therapeutic duplication or wrong doses (Table III). Twenty-four medications had more than one medication related problem. Table IV shows medication related problems for different groups of psychoactive medications as well as the total number of problems encountered for each problem category. Again, statistically significant association existed between the use of inappropriate psychoactive medications and diagnosis of dementia (p=0.047, Pearson Chi Square test).

DISCUSSION

The use of medications in the long-term care setting represents a complex blend of issues arising from several aspects of medical practice. Nursing homes are unique places where the most frail segment of the elderly population lives. Due to multiple medical and psychiatric problems, residents are on multiple medications. Inadequate communication between the nursing homes and the care providers may lead to an increased number of medication usage in this patient population. In most cases, improved communication between the nursing homes and the care providers should reduce the risk of polypharmacy related complications.

Psychoactive medications such as antipsychotic drugs are often used for behaviour disturbances and agitation. There are few studies that suggest the effectiveness of these drugs to control agitation in demented population[13], and literature on this topic is rather limited. But clear evidence is available which links these drugs with extrapyramidal symptoms, gait instability, falls and hip fracture[14-16]. In this study, we noted the use of antipsychotics in 93 (24%) residents, which is comparable to the practice in American nursing homes prior to the implementation of OBRA regulation[7]. Chemical restraints such as antipsychotics should be the last resort to control agitation and behaviour problems in demented residents after the trial of alternative non-pharmacologic approach. Even when antipsychotics has to be prescribed, it is essential to have a clear documentation of the indication for starting, reducing and withdrawing such drugs.

Benzodiazepines, frequently used for agitation in demented patients, also pose increased risk of fall and fracture[17,18]; other adverse effects such as day time somnolence, confusion and ataxia are also observed[19]. In our study population, 65 residents were on benzodiazepines, and 45 of them were on short acting benzodiazepines. The risk of fall, fracture and worsening disability appeared to be highest among the residents of functional category III, as they had the largest number of Benzodiazepine orders (N=37).

Depression is common in nursing home residents who respond well to treatment. But in many cases, it remains undiagnosed and untreated[20-22]. One study showed that only 10% of all nursing home residents with a diagnosis of depression were treated with antidepressants[23]. In this study, 13% (N=50) residents had diagnosis of depression but 28% (N=107) residents were on antidepressant medications. Our findings suggest that clinical presentation of depression has not been overlooked; however the lack of documentation of the diagnosis remains a significant problem. It is understood that antidepressant medications are also being used for indications other that depression alone; none of these diseases were documented in the residents who were on antidepressants without any documented depression. Little was noted about the response to antidepressant therapy. The geriatric depression scale or other similar scales can be used to assess the response to pharmacological intervention.

Anticonvulsant medications were used for 41 residents, and only 10 of them had seizure disorders. So, some of the 31 residents without seizure disorder may have been prescribed anticonvulsant medications for clinical conditions like agitation and behaviour problem. But no such clinical indications were documented for these residents. Nineteen residents with no seizure history also had antipsychotic medications prescribed along with the anticonvulsant medications.

Continuous educational activities for all health care professionals involved in care for the nursing home residents would lead to more appropriate use of psychoactive medications in this most frail and vulnerable segment of the elderly population. Utilisation of non-pharmacological approach to control common psychiatric problems such as agitation and behaviour disturbance should be tried first before resorting to medications.

Relevant authorities of both nursing homes were informed of the study findings. One nursing homes is undergoing medication utilisation review by a geriatrician; a similar programme is being planned for the second nursing home as well.

Better documentation of the clinical diagnoses and indications of all psychoactive medications, use of the smallest effective dose, medication review at regular intervals to assess the need for continued

pharmacologic intervention, and screening for potential adverse drug reaction and drug interaction would improve prescribing practice resulting in better quality of care in Singapore nursing homes.

*OBRA regulation: the US Federal Government rules and regulations contained in the 1987 Omnibus Budget Reconciliation Act (OBRA) and implemented in 1991 place heavy emphasis on assessment and care planning as a means of achieving the highest practicable level of functioning for each resident. Reduction of chemical restraints by reducing psychoactive medication use is considered as an indicator for quality of care in nursing homes.

**Functional Category I-IV: In Singapore, the Resident Assessment Form (RAF) for the nursing home residents measures the need of care for the residents on the basis of their functional and cognitive ability. Those who score <6 are functional category I, a score of 7-24 is functional category II, a score of 25-48 is functional category III and a score >48 is functional category IV. Functional category IV residents are completely dependent for all aspects of care.

CONCLUSION

Majority of the study residents were on psychoactive medications. Residents with dementia were more likely to be on psychoactive medications. The most common problems associated with the prescribing practice of the psychoactive medications observed in this study were that of the lack of documented indication, potential adverse drug reaction, drug-drug interaction and therapeutic duplication. Statistically significant association was observed between the use of inappropriate psychoactive medications and the diagnosis of dementia.

ACKNOWLEDGEMENTS

We would like to thank Dr Derrick Heng of Clinical Trial and Epidemiology Research Unit (CTERU) for helping us with the statistical analysis of the data.

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