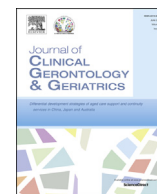


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Original article

Happy pills in nursing homes in Belgium: A cohort study to determine prescribing patterns and relation to fall risk



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ABSTRACT

Background: Mental problems are common in nursing homes, and the medical answer to these conditions is largely pharmacological. However, frail elderly people are particularly vulnerable to psychotropic-related adverse effects. This study documents the current use of psychotropics in Flemish nursing homes, and examines the relation to fall risk.

Methods: This is a cohort study in 651 nursing home residents in 53 nursing homes in Flanders, Belgium. The use of antidepressants, anxiolytics, sedatives, and antipsychotics was registered from the patients' medication charts. The incidence of subsequent falls was registered for a period of 6 months.

Results: In this cohort, 74.8% of nursing home residents without dementia used at least one psychotropic drug; almost 20% used an antipsychotic, approximately 40% used one or more antidepressants; and approximately 60% used one or more benzodiazepines or benzodiazepine-related drugs. The most prescribed antipsychotic was risperidone (35.1%); the most common benzodiazepine was lorazepam (54.8%); and the most frequent antidepressants were citalopram/escitalopram (38.9%) and trazodone (24.9%). The use of psychotropics was mostly chronic. Falls were registered in 24.1% of participants; they were mainly associated with antidepressant use (odds ratio 1.38), and especially with trazodone (odds ratio 1.94).

Conclusion: Despite recommendations against chronic use and a growing body of evidence showing the risk of side effects, the use of psychotropic drugs currently is still alarmingly high in Flemish nursing home residents without dementia. Strategies to optimize prescribing are discussed.

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1. Introduction

Old age comes with a significant chance of mental problems. Major depressive disorder and dysthymia are frequent and have a profound impact on quality of life and daily functioning.^{1,2} Anxiety symptoms and more specifically generalized anxiety disorder are highly prevalent, commonly occur together with affective disorders, and are associated with considerable morbidity.^{3,4} Especially

in old age, assessment and diagnosis of depression as well as anxiety are difficult tasks.^{2,5}

Moreover, in institutionalized elderly people, with but also without dementia, aggressive behavior, agitation, wandering, delusions, and hallucinations are experienced as behavioral disturbances for which therapy is sought.^{6,7} Finally, sleeping problems are common complaints in elderly people, so much the more in nursing homes.⁸

The medical answer to these conditions traditionally is largely pharmacological. Antidepressants,⁹ anxiolytics,¹⁰ hypnotics¹¹ and antipsychotics¹² are commonly prescribed to nursing home residents. However, comorbidity, changes in metabolism and pharmacokinetics, and polypharmacy make this population particularly

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vulnerable to medication-related adverse events. The risk of over-prescription of psychotropics is higher in institutionalized elderly people than in others.¹³ All four classes of drugs are associated with an increased risk of sedation, falls, and cognitive impairment. This paper documents, quantitatively and qualitatively, the current psychotropic drug prescribing patterns in healthy nursing home residents without cognitive impairment in Belgium. Furthermore, we relate the use of these psychotropics to the incidence of falls in our cohort.

2. Methods

This study was part of a large study on respiratory tract infections in 53 nursing homes in Flanders, Belgium.¹⁴ Healthy volunteers aged >65 years (no upper age limit) who gave informed consent were included. Exclusion criteria included advanced chronic illness (e.g., unstable heart disease, chronic obstructive pulmonary disease requiring the use of oxygen, parenteral nutrition, and poorly controlled diabetes) and cognitive impairment. The Mini-Mental State Examination was used to measure cognitive impairment (cutoff 24/30); this test is, in our country, part of the regular routine assessment for people living in nursing homes. The use of psychotropics was registered from the patients' medication charts according to the Anatomical Therapeutic Chemical Classification System. We registered the following drugs: antipsychotics (N05A), anxiolytics (N05B), hypnotics and sedatives (N05C) and antidepressants (N06A). Registration was performed cross-sectionally at the beginning of the study; in addition, in a nonselective sample of 20% of all study participants, drug use was registered a second time at the end of the 6-month study period.

Fall incidence was registered by the nursing home staff on a structured form, for a period of 6 months. A fall was defined as "unintentionally coming to rest on the ground, with or without physical injury as a consequence".

Descriptive analyses were performed using SPSS version 20.0 (SPSS Inc., Chicago, IL, USA). Odds ratios (ORs) for fall risk were calculated in univariate logistic regression models; furthermore, for each class of drugs (antidepressants, antipsychotics, anxiolytics, and antipsychotics), ORs were adjusted for concurrent use of drugs of the other classes.

Ethical approval for this study was granted by the Medical Research Ethics Committee, University Hospital of Antwerp, Wilrijk, Belgium. This approval was considered sufficient by the participating nursing homes – they were free but not obliged to seek for ethical advice on participation with their own ethical board. Every participating nursing home resident gave written consent to participate in the study.

3. Results

The study cohort consisted of 651 nursing home residents; their characteristics are shown in Table 1. The male/female ratio (25/75%) reflected the population in the sampled nursing homes. In this cohort, three in four non-demented elderly people took at least one psychotropic. At the end of the study period, the number of psychotropic drugs was unchanged in most (73%) of an aselective sample of 20% of study participants. In 14%, one or more psychotropics were added, and in 13% the number of psychotropics had diminished.

3.1. Antidepressants

Antidepressants were used by 42% of participants (Table 1); in people taking a single antidepressant, 56.1% took selective

Table 1
Characteristics of study participants (n = 651).

Mean age (±SD; range)	84.05 years (±7.14; 65–101)
Sex	
Female	488 (75.0)
Male	163 (25.0)
Use of psychotropics	
0	164 (25.2)
1	230 (35.4)
2	153 (23.5)
3	65 (10.0)
≥4 (max. 7)	39 (5.9)
Use of antidepressants	
0	378 (58.0)
1	224 (34.4)
2	46 (7.1)
3	2 (0.3)
4	1 (0.2)
Use of anxiolytics/hypnotics	
0	277 (42.5)
1	307 (47.2)
2	60 (9.2)
3	7 (1.1)
Use of antipsychotics	
0	536 (82.4)
1	10 (1.7)
2	4 (0.6)

Data are presented as n (%), unless otherwise indicated.
SD = standard deviation.

serotonin reuptake inhibitors (SSRIs), 8.9% serotonin–noradrenalin reuptake inhibitors (SNRIs), 6.3% tricyclic antidepressants (TCAs), and 19.4% trazodone. Other drugs (9.3%) were mainly mianserine and mirtazapine. Most prescribed substances were trazodone (24.9%), citalopram (23.1%), escitalopram (15.8%), sertraline (13.9%), paroxetine (9.2%), venlafaxine (8.1%), amitriptyline (6.6%), and mirtazapine (6.6%). Most prescribed single antidepressants were citalopram (19.8%), trazodone (19.4%), escitalopram (14.7%), sertraline (11.7%), and paroxetine (8.8%).

3.2. Anxiolytics and hypnotics

Almost 60% of nursing home residents took benzodiazepines and benzodiazepine-related drugs (zolpidem and zopiclone; Table 1). Anxiolytics were used by 23.8% and sedatives by 40.3%. Most prescribed drugs were lormetazepam (54.8%), lorazepam (17.4%), zolpidem (15.2%), alprazolam (11.5%), temazepam (6.5%), and bromazepam (5.4%). Flunitrazepam was used by 1.3% of patients.

3.3. Antipsychotics

Most prescribed antipsychotics were risperidone (35.1%), olanzapine (9.6%), flupentixol (9.6%), haloperidol (7.9%), pipamperone (7.9%), and melperone HCl (7.0%).

3.4. Influence of age and sex

In this cohort, age had no influence on the use of antidepressants, anxiolytics/hypnotics, or antipsychotics, or on the global use of psychotropics.

Female residents were more likely to use psychotropics (77.0% vs. 67.2%, $p = 0.02$), and more specifically, they used more anxiolytics/sedatives (61.9% vs. 42.4%, $p < 0.001$). We observed no effect of age or sex on the choice of specific type of drug within the class of antidepressants, anxiolytics, and antipsychotics.

Table 2
Unadjusted and adjusted ORs for fall risk.

	Unadjusted OR (95% CI)	Significance level	Adjusted ^a OR (95% CI)	Significance level
Antidepressants	1.70 (1.10–2.62)	0.02	1.68 (1.08–2.62)	0.02
Benzodiazepines	1.08 (0.70–1.66)	0.75	1.04 (0.67–1.63)	0.86
Antipsychotics	1.25 (0.74–2.13)	0.41	1.18 (0.69–2.03)	0.54

^a Adjusted for use of the other classes, that is, for antidepressants: adjusted for benzodiazepines and antipsychotics, etc.

3.5. Fall risk

In our population, 24.1% of people had at least one fall in the follow-up period of 6 months. Univariate ORs are shown. Table 2 shows univariate and adjusted ORs for use of antidepressants, benzodiazepines, and antipsychotics. Adjusting ORs for use of the other medication classes did not result in qualitative changes. Neither sex nor age had a significant effect on fall incidence in this population [OR 1.25 ($p = 0.36$) and 1.02 ($p = 0.21$), respectively].

Antidepressant use was positively associated with risk of falls ($p = 0.02$); OR for fall risk with one drug was 1.38, and was 2.87 with two drugs. Patients taking trazodone alone or in combination with other antidepressants fell more often than patients who did not take trazodone (36% vs. 22.7%, OR = 1.92, $p = 0.05$). The tendency to fall was greater in TCA users (OR = 1.73), but the difference was not statistically significant ($p = 0.37$).

We observed no clear association between benzodiazepine use and fall risk in our population (OR = 1.08, $p = 0.75$). No clear difference in fall risk between anxiolytics (N05B) and hypnotics and sedatives (N05C) was found. We observed no clear association between antipsychotics use and fall risk in our population (OR = 1.25, $p = 0.41$). Within the group of antipsychotics, we found a higher chance of falls in patients taking haloperidol (OR = 4.27, $p = 0.04$), and a tendency in patients taking pipamperone (OR = 4.80, $p = 0.06$). No such effect was found for risperidone, olanzapine, melperone HCl, and flupentixol.

4. Discussion

This study provides detailed information on current prescribing practices for non-demented residents of nursing homes in Belgium. In our cohort, three quarters of people used at least one psychotropic drug; almost 20% used an antipsychotic; about 40% used one or more antidepressants; and almost 60% used one or more benzodiazepines or benzodiazepine-related drugs. Similar or even higher rates have been found in other studies, although comparisons are hampered by the fact that most reports do not differentiate between residents with and without dementia.^{7,15–17}

The lack of clinical information, including the reasons for prescription of psychotropics, and the fact that dosages were not registered, is a limitation that should be considered when interpreting the findings of this study. Registration of drug use was essentially cross-sectional, however, re-registration in an aselective sample of 20% of participants at the end of the study showed that the use of psychotropics was mostly long term, which is a common finding in elderly people.¹⁸ Strengths of our study include the fact that registration was done directly from the patients' medication charts in the nursing homes (not from the medical files in the doctor's office), the clear definition of a fall, and the prospective study design for fall registration.¹⁹

In Belgium, we have a mixed public and private health care system. Long-term residential care is run by community social services, private nonprofit corporations, or religious charities. About 3000 rest/nursing homes are spread all over the country; except for dementia, homes are not specialized in specific illnesses

and accept residents with various medical illnesses. In Belgium, every home is legally obliged to have a medical coordinator; this is a general practitioner (GP) who coordinates quality initiatives, such as development and use of a formulary. This medical coordinator is also the GP for some of the residents, although most residents keep their own GP. This means that a large number of different prescribers are active in most nursing homes. These are usually independent GPs who have their own practice and who visit the nursing homes periodically.²⁰

The prevalence of antidepressant use is similar to other studies.¹⁶ Evidence for effectiveness of antidepressants in elderly homes is limited and shows a moderate response to treatment.⁹ Underuse as well as overuse have been described in this population.²¹ A study in nursing homes in the USA showed a discrepancy between prescriptions of antidepressants and the presence or absence of depression diagnosis in medical charts.²² Similarly, in a subgroup of our study population, we obtained some clinical information by means of the 36-Item Short Form Health Survey (SF-36); these data have been reported elsewhere.²³ Interestingly, no consistent link was found between the use of psychopharmacology and the items of the mental health scale of this SF-36.²³ Qualitative research indicates that the prescription of antidepressants in elderly nursing home residents commonly is not preceded by a thorough diagnostic process.²⁴ A study in Swedish nursing homes showed that SSRIs could be successfully withdrawn in more than half of the patients on long-term treatment.²⁵

Despite recommendations against the use of benzodiazepines in elderly people, they are still the most commonly used psychotropics in this population. The prevalence of benzodiazepine use in our study in non-dementia nursing home residents was even slightly higher than in a similar registration in Belgium a few years earlier, in a mixed dementia/non-dementia population.¹⁶ Discontinuation of benzodiazepine use in elderly people often has a beneficial effect on psychomotor and cognitive functioning,^{26,27} and even limited tailored interventions seem to be effective and safe in reducing the use of these drugs.²⁶ However, attitudes of both health care providers and patients seem to be a barrier to discontinuation of these drugs.²⁸

We were surprised by the ample use of antipsychotics in this non-dementia population; however, similar data have been found in other studies.⁷ It is not entirely clear why the prescription rate of this class of medication is so high in patients without dementia. Antipsychotics have an unfavorable safety profile in this population.^{29,30} A recent study in elderly nursing home residents has shown that second-generation antipsychotics are commonly used for off-label indications, including treatment of bipolar disorder, depression, and psychotic symptoms; these indications are not always evidence based.³¹ Another study reviewing the indications for antipsychotic prescribing in 693,000 nursing home residents, stated that one in four patients had no appropriate indication; most common inappropriate indications were impaired memory, depression without psychotic features, and indifference to surroundings.³²

Within nursing homes, institutional characteristics may influence prescribing practices and quality. The size of a nursing home, private versus public setting, education level and number of staffing, number of different prescribers, use of a medication management system such as a formulary, and case mix of residents may be correlated with prescribing practices. An earlier study on prescribing in general in 76 nursing homes in Belgium unveiled that prescription rate and prescription problems were mainly correlated with poly pathology and with a less-favorable resident/staff ratio; number of prescribers and activity of the medical coordinator had a smaller influence.²⁰ As described in the methods section, our

sample consisted of relatively healthy nursing home residents without advanced chronic illness and cognitive impairment – medication use in our population is not representative for global prescription practices in these nursing homes, but it can be expected that in residents with more pathology and with dementia, prescription rate will be even higher.

Falls are a common health problem in nursing homes and risk factors can be categorized as extrinsic (e.g., unsafe footwear or poor lighting), intrinsic (e.g., vestibular problems or vision loss), and behavioral.³³ Psychotropic drugs are an independent intrinsic risk factor for falls in elderly people.^{19,33}

The risk estimates for falls associated with antidepressant use in our study were similar to ORs from a recent meta-analysis³⁴: 1.36 [95% confidence interval (CI): 1.13–1.76] versus 1.38 in our study. For neuroleptics and antipsychotics, the risk was comparable: 1.39 (95% CI: 0.94–2.0) versus 1.25 in our study, but for benzodiazepines the risk appeared to be smaller in our cohort [1.41 (95% CI: 1.20–1.71) versus 1.1 in our study]. Tolerance to side effects in chronic use of benzodiazepines³⁵ and the fact that our cohort was restricted to non-dementia elderly people, might have had an influence on the medication-associated risk. In general, the use of typical antipsychotics, long-acting benzodiazepines, and TCAs is discouraged in elderly people,^{15,36} and decreasing prescription rates of these drugs is considered as a good trend in clinical practice. Furthermore, SSRIs, SNRIs, and atypical antipsychotics recently have also been shown to have a less-favorable safety profile than initially thought.^{30,37,38}

However, recent observations show that the prescription rate of psychotropics is increasing instead of decreasing in nursing homes.¹⁵ It is not clear whether this is a result of better awareness of mental problems. Stress in nursing home staff and logistic factors (lower staff/patient ratio, and a higher number of patients living in one room) seem to correlate with a higher use and/or inappropriate use of these medications in most^{20,39,40} but not in all studies.⁴¹ Although nursing staff have been shown to express a preference for non-drug interventions for psychosocial and behavioral problems,⁴² understaffing and time pressure may compromise the adoption of ideals and values in practice,⁴³ and favor the choice for an easier, that is, pharmacological solution to some challenges. In physicians, a high patient load may compromise judicious prescribing.⁴⁴ Furthermore, psychotropic marketing practices may drive prescribing of these classes of drugs in physicians who lack adequate, evidence-based training.⁴⁵

The good news is that interventions to reduce inappropriate drug use might be efficient in this frail population, because people in nursing homes can be reached as a group.⁴⁶ There is moderate evidence that interventions that reduce the use of psychotropic medications, as a single intervention or as part of a multifactorial intervention, are effective in reducing falls.³³ Interventions that aim at reducing the initiation of psychotropics if alternatives are possible, may be another valuable strategy next to reducing existing prescriptions. Validated tools exist to assess appropriateness of prescribing.⁴⁷ Educating health care providers in geriatric psychopharmacology can reduce the use of antipsychotics and benzodiazepines in nursing homes, without adversely affecting the behavior and functioning of the residents.⁴⁸ Better staffing in nursing homes has also been shown to reduce chronic use of benzodiazepines.⁴⁹

Education seems to be a key factor in improving prescribing practices. Structural measures, such as organizing continuous education, allocation of educational time to relevant personnel, and installing explicit routines for medication review, will need to be taken in order to maximize the chances of success.⁵⁰

In conclusion, the present study gives an oversight of how many and which psychotropics are used in Flemish nursing homes.

Antidepressants were especially correlated with fall risk in our population of institutionalized elderly people without dementia. Despite recommendations against chronic use and a growing body of evidence showing the risk of side effects, the use of psychotropic drugs currently is still alarmingly high in nursing homes in our country.

Conflicts of interest

None.

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