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Use of antipsychotics among nonagenarian residents in long-term institutional care in Finland

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Abstract

Background: there is a paucity of information about the use of antipsychotic medication in long-term care, especially among the oldest-old residents.
Objective: to analyse the factors associated with the use of antipsychotic medication among nonagenarian residents in long-term institutional care.
Design: a retrospective study was designed from cross-sectional data, gathered in the period 1 January 2003 to 30 June 2003, in Finland. Data were extracted from the Resident Assessment Instrument database, based on Minimum Data Set 2.0 assessments.
Setting: data were provided by 23 hospital-based institutions and 43 residential homes.
Subjects: residents aged ≥90 years were included, consisting of 1,334 resident assessments.
Results: almost a third of the residents received one or more antipsychotic medication. In the logistic regression analysis, factors associated with the use of antipsychotics among nonagenarian residents were as follows: socially inappropriate or disruptive behavioural symptoms [odds ratio (OR) 1.86, 95% confidence interval (CI) 1.36–2.54], concomitant anxiolytic medication (OR 1.83, 95% CI 1.39–2.42), recurring anxious complaints (OR 1.61, 95% CI 1.17–2.22), recurring physical movements (OR 1.43, 95% CI 1.08–1.91) and unsettled relationships (OR 1.35, 95% CI 1.15–1.57). A good sense of initiative or involvement was significantly less likely to be associated with antipsychotics (OR 0.86, 95% CI 0.80–0.94). There were no associations between any psychiatric diagnoses or symptoms and the use of antipsychotics.
Conclusions: antipsychotic medication use in nonagenarians in long-term institutions was common and seemed in many cases to be associated with residents' negative attitudes to others. Querulous residents received antipsychotics more commonly than those with good social skills. Clearly defined indications may not be fulfilled in many cases, and an evaluation of treatment may be lacking. These may indicate that in Finland, there could be a considerable gap between antipsychotic medication recommendations and actual clinical practice.

Keywords: *antipsychotic agent, long-term institutional care, nonagenarian, Minimum Data Set, elderly*

Introduction

The oldest old (≥85 years) are the fastest growing age group in the population throughout the developed world. It has been estimated that the prevalence rate of centenarians in industrialised countries is 0.5–1 per 10,000 [1, 2]. The number of octogenarians has grown 4-fold, nonagenarians 8-fold and centenarians >20-fold from 1950 to 1990 [2]. In 2003 in Finland, 1.6% of the population was aged ≥85 years [3], and 18.4% of them were permanently in long-term institutional care including nursing homes and hospitals [4].

Antipsychotics are widely used in nursing homes in the UK and the US [5, 6]. Oborne and coworkers stated that 24.5% of residents in nursing homes in the UK used antipsychotics (estimated appropriate use 18%) [5]. The

corresponding rate in the US study was 27.6% (appropriate 19%) [6]. Less than half of residents in that study received antipsychotics in accordance with nursing home prescribing guidelines. However, an outcome of >40% antipsychotic treatment has been reported among residents with dementia in residential placements when psychological and environmental interventions have been ineffective [7].

The treatment data deficiency is most striking among the oldest-old and frail medically ill elderly patients [8]. According to the Expert Consensus Guidelines (US 2004), antipsychotics in the elderly are indicated for disorders with psychotic symptoms, that is schizophrenia, mania with psychosis, agitated dementia with delusions, psychotic major depression and delusional disorders [9]. On the contrary, experts do not recommend antipsychotics for irritability and hostility in the absence of a major psychiatric syndrome, non-psychotic major depression, generalised anxiety disorder, hypochondriasis or insomnia/sleep disturbance without a major psychiatric syndrome. Atypical antipsychotics have been recommended for behavioural and psychiatric symptoms in dementia [9], even though the evidence of their effectiveness is still scanty [10]. An increased risk of serious cerebrovascular adverse events (CVAEs) and mortality has also been associated with the use of atypical antipsychotics in older patients with dementia [11]. Regulators in Europe and the US now warn of the risks and off license use of these drugs [12, 13]. However, some recent studies have reported that older patients with dementia who take atypical antipsychotics have a CVAE risk similar to that of those taking typical antipsychotics [14].

The aim of this study was to analyse the use of antipsychotic medications and associated factors among nonagenarian residents in long-term institutional care in Finland. We hypothesised that the use of antipsychotic medication would be common among nonagenarians in institutions and would be associated with psychotic and behavioural symptoms of dementia.

Materials and methods

The data were drawn from the Resident Assessment Instrument (RAI) database consisting of Minimum Data Set (MDS) assessments version 2.0 for long-term care facilities. The RAI database is located in STAKES (National Research and Development Centre for Welfare and Health, Finland). The assessments extracted originated from 23 hospital-based long-term care institutions (69 wards) and 43 residential homes (190 wards) in 26 municipalities located in different parts of Finland. Every resident aged ≥90 years was included in the extracted set. Data from altogether 1,334 residents were gathered. All the units were classified for elderly care and none for psychiatric care.

The extracted data set covered the period from 1 January to 30 June in 2003. The 6-month follow-up periods embedded in the database were originally designed for scientific, administrative and organisational purposes, and this time period was adopted for the present analysis. In the time period, each resident was assessed only once and there were no exclusion criteria or refusals. Units providing assessments to the RAI database collaborate on a voluntary basis. The total number of assessments represents ~20% of the Finnish long-term institutional care population in 2003.

The MDS assessment includes demographic information such as age, gender, marital status, place of admission, length of stay and history of psychiatric and medical illnesses. The diagnoses (ICD-10) for the assessments were taken from medical records, as recorded by the treating physicians [mostly general practitioners (GPs)]. Due to the high prevalence of dementia in long-term care facilities and in order to ascertain the prevalence of psychiatric disorders not linked to dementia, the psychiatric diagnoses available in the data were reclassified into a hierarchical order as follows: (i) all residents with any diagnosed form of dementia, (ii) residents without dementia and with schizophrenia, (iii) residents without dementia and without schizophrenia but with diagnoses of mood disorders and (iv) residents without all the above diagnoses but with diagnosis of anxiety. Actual medical diagnoses were gathered, such as stroke, deep venous thrombosis, hip fracture, diabetes and cardiovascular diseases.

The personnel performing the MDS assessments on each of the wards had received minimum 20-h standardised education that included assessments step-by-step according to the training manual [15] and the use of software [16].

MDS assessment questionnaires consist of nearly 400 variables that have been proven valid and reliable in several countries [17, 18]. Five of the MDS items from different sections are combined to form the Cognitive Performance Scale (CPS, scale 0–6, where 0 equals intact cognition and 6 equals very severe decline) for measuring cognition [19–21]. The CPS is very reliable compared with Mini-Mental State Examination (MMSE) [21] and the Test for Severe Impairment (TSI) [20, 21]. Four of the MDS items are combined to form the Activity of Daily Living (ADL) hierarchy scale (scale 0–6, where 0 equals normal functional capacity and 6 equals very severe decline) for measuring physical function. On the Depression Rating Scale (DRS, scale 0–14), at least 3 points refer to probability of depression [22].

In addition, MDS questionnaire includes evaluations of several possible indicators of psychiatric and behavioural symptoms such as wandering, verbally or physically abusive, socially disruptive behaviour or resisting care (Table 1). The evaluation is based on the observations made by the personnel according to the instructions in the manual over a 7-day period during assessment. The condition is coded for whether present or not. Mood and behaviour, sense of initiative/involvement and unsettled relationship items are given in detail in Table 2. The usability of the variables has been tested and validated [23, 24].

All statistical analyses were performed using SAS version 8.2 (SAS Institute, Cary, NC, USA). Socio-demographic factors were tested using either chi-square test or Student's *t*-test. Variables (Table 1) and individual items of entities (Table 2) were dichotomised to 0 or 1. The associations between them and antipsychotic use were then tested using chi-square test. Then, a summary scale was formed in

Table 1. Use of antipsychotic medications by diagnosis, psychotropic medication and behavioural and psychiatric symptoms in 2003 in Finnish nonagenarian residents in institutions (n = 1,334)

	Condition/medication present		Condition/medication not present		
	Overall (n)	On antipsychotics [n (%)]	Overall (n)	On antipsychotics [n (%)]	P-value
Diagnosis					
Dementia	782	255 (32.6)	552	139 (25.2)	<0.003
Schizophrenia	13	7 (53.9)	1,321	387 (29.3)	<0.05
Depression	154	51 (33.1)	1,180	343 (29.1)	<0.3
Anxiety disorder	29	18 (62.1)	1,305	376 (28.8)	<0.0001
Psychotropic medication					
Antidepressant	451	132 (29.3)	883	262 (29.7)	<0.88
Anxiolytic	352	155 (44.0)	982	239 (24.3)	<0.0001
Hypnotic	450	139 (30.9)	884	255 (28.9)	<0.44
Behavioural symptoms					
Wandering	202	88 (43.6)	1,132	306 (27.0)	<0.0001
Verbally abusive	197	92 (46.7)	1,137	302 (26.6)	<0.0001
Physically abusive	121	58 (47.9)	1,213	336 (27.7)	<0.0001
Socially disruptive	276	141 (51.1)	1,058	253 (23.9)	<0.0001
Resists care	409	166 (40.6)	925	228 (24.7)	<0.0001
Psychiatric symptoms					
Delusions	127	70 (55.1)	1,207	324 (26.8)	<0.0001
Hallucinations	171	83 (48.5)	1,163	311 (26.7)	<0.0001

which the new dichotomic variable was 0 if no signs in any individual item of entities 'sense of initiative/involvement' or 'unsettled relationships' (Table 2) were found and was 1 if any of them was present. These new variables were likewise first tested separately with chi-square test. Statistically significant (P<0.05) factors according to these tests were included in the logistic regression model. The statistical analyses were performed stepwise.

Results

Univariate results

The mean age of the sample was 92.9 years (±2.7) (range 90–107), and 88% were women. Of the residents, 5.5% had a previous history of mental illness and 1.5% of them had arrived from a psychiatric hospital. The prevalences of psychiatric diagnoses were as follows: dementia 58.6%, depression 11.5%, anxiety disorders 2.2% and schizophrenia 1.0%. The prevalence of moderate or severe cognitive impairment (CPS 3–6) was 71.4%, whereas it was 19.5% for mild cognitive impairment (CPS 1–2), and 8.8% were assessed to be without any sign of cognitive impairment at all.

The proportion of residents prescribed one or more antipsychotics was 29.5% of the study population. There were no associations between the use of antipsychotics and age or gender. Of the residents, 49.3% of those with previous psychiatric history used antipsychotics. The proportion of residents prescribed antidepressants was 33.8%, anxiolytics 26.4% and hypnotics 33.7%. Twenty-eight per cent received no psychotropic medication.

A third (32.6%) of residents with a diagnosis of dementia received antipsychotics. In residents with moderate to severe cognitive impairment (CPS 3–6), the proportion of antipsychotics use was 31.8%, 28.1% with mild cognitive impairment (CPS 1–2) and 10% in cognitively intact subjects (P<0.0001). Residents who had some psychiatric diagnosis (except dementia) used antipsychotics more often (39.9%) than those without (27.6%) (P<0.0004). The comparisons of antipsychotic use between the groups with and without diagnosis, medications and symptoms are given in Table 1 and other behavioural items in Table 2.

Among medical diagnoses, the most striking associations between the use of antipsychotics were found with hip fracture (37.4%, P<0.0027) and deep venous thrombosis (52.4%, P<0.021). In the residents with a diagnosis of stroke (11.9%), the prescription rate of antipsychotics was (in univariate analysis) lower than without this diagnosis. No statistically significant associations of antipsychotic use were found in residents with diabetes mellitus or cardiovascular diseases. Moreover, impaired hearing and vision were not associated with the use of antipsychotics. Residents who were bedridden all or most of the time (26.9%) received antipsychotics (29.8%) as frequently as the rest of the population.

Multivariate results

Logistic regression modelling identified factors that were significantly independently associated with the use of antipsychotics among nonagenarian residents in 2003: socially inappropriate or disruptive behavioural symptoms [odds ratio (OR) 1.86, 95% confidence interval (CI) 1.36–2.54], concomitant anxiolytic medication (OR 1.83, 95% CI 1.39–2.42), recurring anxious complaints (OR 1.61, 95% CI 1.17–2.22), recurring physical movements (OR 1.43, 95% CI 1.08–1.91) and unsettled relationships (OR 1.35, 95% CI 1.15–1.57) (Table 3). Those with a good sense of initiative or involvement were significantly less likely to be taking antipsychotics (OR 0.86, 95% CI 0.80–0.94). In multivariate analysis, the

Table 2. Use of antipsychotic medications by individual items of Minimum Data Set (MDS) in 2003 in Finnish nonagenarian residents in institutions (n = 1,334)

	Condition present		Condition not present		
	Overall (n)	On antipsychotics [n (%)]	Overall (n)	On antipsychotics [n (%)]	P-value
Mood and behaviour items					
Resident made negative statements	252	83 (32.9)	1,082	311 (28.7)	<0.19
Recurring questions	359	148 (41.2)	975	246 (25.2)	<0.0001
Recurring verbalisations	214	79 (36.9)	1,120	315 (28.1)	<0.01
Persistent anger with self or others	351	154 (43.9)	983	240 (24.4)	<0.0001
Self deprecation	212	63 (29.7)	1,122	331 (29.5)	<0.95
Expressions of what appear to be unrealistic fears	256	113 (44.1)	1,078	281 (26.1)	<0.0001
Recurrent statements that something terrible is about to happen	97	36 (37.1)	1,237	358 (28.9)	<0.09
Recurring health complaints	163	50 (30.7)	1,171	344 (29.4)	<0.73
Recurring anxious complaints	292	141 (48.3)	1,042	253 (24.3)	<0.0001
Unpleasant mood in the morning	256	107 (41.8)	1,078	287 (26.6)	<0.0001
Insomnia/change in usual sleep pattern	354	135 (38.1)	980	256 (26.4)	<0.0001
Crying, tearfulness	177	62 (35.0)	1,157	332 (28.7)	<0.09
Recurring physical movements	386	165 (42.8)	948	229 (24.2)	<0.0001
Withdrawal from activities of interest	478	175 (36.6)	856	219 (25.6)	<0.0001
Reduced social interaction	520	181 (34.8)	814	213 (26.2)	<0.001
Persistent moodiness	520	193 (37.1)	814	210 (24.7)	<0.0001
Sense of initiative/involvement					
At ease interacting with others	465	101 (21.7)	866	292 (33.7)	<0.0001
At ease doing planned or structured activities	316	64 (20.3)	1,015	329 (32.4)	<0.0001
At ease doing self-initiated activities	241	47 (19.5)	1,090	346 (31.7)	<0.0002
Establishes own goals	176	33 (18.8)	1,155	360 (31.2)	<0.0008
Pursues involvement in life of facility	429	102 (23.8)	902	291 (32.3)	<0.0015
Accept invitations into most group activities	428	106 (24.8)	903	287 (31.8)	<0.01
None of the above	575	193 (33.6)	756	200 (26.5)	<0.005
Unsettled relationships					
Covert/open conflict or repeated criticism of staff	106	49 (46.2)	1,225	344 (28.1)	<0.0001
Unhappy with roommate	49	19 (38.8)	1,282	374 (29.2)	<0.15
Unhappy with residents other than roommate	149	80 (53.7)	1,182	313 (26.5)	<0.0001
Openly expressed conflict with family	35	20 (57.1)	1,296	373 (28.8)	<0.0003
Absence of personal contact with family/friends	68	26 (38.2)	1,263	367 (29.1)	<0.11
Recent loss of family member	37	12 (32.4)	1,294	381 (29.4)	<0.69
Does not adjust easily to changed routines	187	78 (41.7)	1,144	315 (27.5)	<0.0001

Table 3. Results of logistic regression analysis explaining antipsychotic drug use in 2003 among Finnish nonagenarian residents in institutions (n = 1,334)

	Odds ratio (95% CI)
Diagnosis of schizophrenia	2.25 (0.71–7.14)
Socially disruptive behavioural symptoms	1.86 (1.36–2.54)
Anxiolytic concomitant	1.83 (1.39–2.42)
Recurring anxious complaints	1.61 (1.17–2.22)
Recurring physical movements	1.43 (1.08–1.91)
Unsettled relationships	1.35 (1.15–1.57)
Sense of initiative/involvement	0.86 (0.80–0.94)

CI, confidence interval

significance of association between antipsychotic drug use and any dementia, cognitive impairment or any psychiatric diagnosis disappeared.

Discussion

The residents in this study represent the upper end of age in the institutionalised elderly population. Because of the high age, the proportion of women and residents with some cognitive impairment was high. Studies on antipsychotic drug use frequency in such high age populations are rare. There are some reports about antipsychotic use in 'younger' elderly as well as in special groups such as patients with dementia [7, 25]. Elderly men have been reported to receive more antipsychotics than women [26]. However, in the present study, there was no difference between genders in antipsychotic use.

The main finding this study on 1,334 nonagenarian residents was the relatively high level of antipsychotic prescribing in long-term care: 30% received antipsychotic medication. This finding concurs with Hosia-Randell and Pitkälä in 2005 [27], who stated that 31.3% of nonagenarian residents in nursing homes in Helsinki were taking antipsychotics. Accordingly, the present result is in line with the previous findings of study groups of Oborne (24.5%) and Briesacher (27.6%), even though the residents in the present study were older [5, 6]. In the study by Lindesay *et al.*, 2003 [26], the proportion (17%) of antipsychotics used in nursing home residents aged >85 years seemed to be smaller. In contrast, only 5% of Swedish nonagenarians received antipsychotics [28]. However, three quarters of them were living in their own homes.

Cognitive impairment was associated with behavioural problems and use of antipsychotic medication in the UK [25]. Börjesson-Hanson *et al.* [29] reported that the prevalence of dementia among institutionalised subjects aged 95 years was 78%. However, in the present study, only 58.6% of nonagenarian residents had diagnosis of dementia, but ~90% had cognitive impairment of some degree. This discrepancy is due to the fact that the cause of cognitive impairment in this age group is only infrequently ascertained. Approximately one-third of residents with a diagnosis of dementia received antipsychotics, but logistic regression model did not reveal significant differences in antipsychotic use between residents with dementia or cognitive impairment and the rest of the study population. Thus, in this oldest-old population, cognitive impairment is so common that its role alone in necessitating antipsychotic treatment may not be as crucial as in younger age groups.

Around 15% of the residents in this study had some major psychiatric diagnosis (other than dementia), and 40% of them used antipsychotics. This seemed to be higher than that reported in Sweden, where 9% of 85-year-old population (not in institutions) who had some psychiatric diagnosis (24.3%) were using antipsychotics [30]. In the present study, the prevalence of antipsychotic use among those residents suffering from anxiety disorders was higher (62%) than in the rest of the population (28.8%). In the logistic regression model, however, the difference was no longer significant. Among residents with schizophrenia, the use of antipsychotics only tended to be higher (54%) than in other residents even in the univariate model. Briesacher *et al.* [6] in 2005 stated that those using antipsychotics compared with non-users were more likely to have schizophrenia, delusional disorders, hallucinations and anxiety. This contradicts the present findings of no associations between major psychiatric diagnoses or symptoms (delusions and hallucinations) and the use of antipsychotics. The difference between the studies may be due to the fact that the residents in the US study were about 10 years younger than in the work in hand. Productive psychiatric symptoms in the oldest old may no longer be prominent even in major psychiatric disorders.

In univariate analyses, medical diagnoses such as hip fracture and deep venous thrombosis were associated with more frequent antipsychotic use. However, residents with a diagnosis of stroke were prescribed less antipsychotics. In the multivariate model, however, all these differences disappeared.

In the logistic regression model, only five aspects were associated with increased frequency of antipsychotic use: socially disruptive behavioural symptoms, concomitant anxiolytic medication, recurring anxious complaints, recurring physical movements and unsettled relationships, all of which would be inappropriate indications for antipsychotic use. However, these findings concur with those of Briesacher and coworkers [6] in 2005, who stated that non-aggressive behavioural problems, such as restlessness (51.7%), unsociability (34.2%), uncooperativeness (30.4%) and indifference to their surroundings (25.1%), were common among residents receiving inappropriately prescribed antipsychotics.

Antipsychotic drug use among nonagenarians with concomitant use of anxiolytics was decidedly high. More than one in four (26%) of the Finnish nonagenarian residents in this study received anxiolytics, and 44% of them received concomitant antipsychotics. Of the nonagenarians, only 2% suffered from anxiety disorders, and despite the fact that these disorders had seldom been properly diagnosed, the symptoms were frequently registered. In old age, anxiety has been reported to be associated with female sex, stressful life events, insufficient network and having no regular visitors [31, 32].

Individuals who had good sense of initiative or involvement were less likely to receive antipsychotic medication. They could interact easily with others and were involved in group activities and responded positively to new activities. It is unlikely that these residents were less cognitively impaired and therefore possessed more social skills because forcing the CPS scale into the final regression model, the protecting power of the social skills did not deteriorate. It may be that antipsychotics are used in many cases to relieve symptoms associated with the lack of social contacts or poor life satisfaction.

Potential limitations in this study include its retrospective nature and the limitations of the MDS to reveal the lack of indications for the use of antipsychotics, their dosages and duration and also the inability to distinguish between new atypical antipsychotics and typical neuroleptics that are not included in the assessment. These issues warrant further study. Moreover, OBRA'87 (The Omnibus Budget Reconciliation Act of 1987) guidelines [33] concerning the appropriateness of antipsychotic drug treatment were not specifically checked in this study. Although MDS items have demonstrated good to excellent reliability, these studies have not been performed specifically on the oldest old. Moreover, these data did not include any severity or frequency assessment of psychotic or behavioural symptoms. One limitation in this study is the nature of the sample: the view is restricted to the population in long-term institutional care. Although half of those aged ≥95 years reside in nursing homes, this sample cannot be representative of very old persons living in the community.

Conclusions

Antipsychotic medication use in nonagenarians in long-term institutions was common and seemed in many cases to be associated with the residents' negative attitudes to others. However, it may be possible to make a reliable distinction of these attitudes from behavioural symptoms. In this study, clearly defined indications may not be fulfilled in many cases, and an evaluation of treatment may be lacking. Thus, there seems to be a considerable gap between antipsychotic medication recommendations and clinical practice. The risk of inappropriate use of antipsychotics might be especially high in those residents who were querulous or had staff–resident friction. More attention should be paid to the appropriate use of antipsychotics among this frail population. There is a need to redress this balance to ensure that the prescribing of antipsychotics in very old people is done according to the guidelines.

Key points

- Almost a third of nonagenarian residents received one or more antipsychotic medication.
- Querulous residents received antipsychotics more commonly than those with good social skills.
- There were no associations between any psychiatric symptoms or diagnoses including dementia and the use of antipsychotics.

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Conflicts of interest

There are no conflicts of interest to declare.

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