ORIGINAL ARTICLE

The Pharmacotherapy of Neuropsychiatric Symptoms of Dementia

A Cross-Sectional Study in 18 Homes for the Elderly in Berlin

Tomislav Majic, Jan-Paul Pluta, Thomas Mell, Marion C. Aichberger, Yvonne Treusch, Hans Gutzmann, Andreas Heinz, Michael A. Rapp

Klinik für Psychiatrie und Psychotherapie, Charité Campus Mitte, Berlin: Majic, Pluta, Mell, Dr. med. Aichberger, Treusch, Prof. Dr. Heinz, Dr. phil. Dr. med. Rapp

Gerontopsychiatrisches Zentrum, Psychiatrische Universitätsklinik der Charité im St. Hedwig Krankenhaus, Berlin: Majic, Mell, Dr. med. Aichberger, Treusch, Dr. phil. Dr. med. Rapp

Klinik für Psychiatrie und Psychotherapie, Krankenhaus Hedwigshöhe, Berlin: Prof. Dr. med. Gutzmann

SUMMARY

Background: The neuropsychiatric symptoms of dementia, including aggressiveness, agitation, depression, and apathy are often treated with psychotropic drugs and are a frequent reason for hospitalization, placing an economic burden on the health care system. International guidelines recommend syndrome-specific pharmacotherapy. We studied the question whether drug-prescribing practices are, in fact, syndrome-specific.

Methods: In a cross-sectional study in 18 homes for the elderly in Berlin, we used syndrome-specific scales to determine the prevalence of apathy, depression, and aggressiveness and the quantity of psychotropic drugs prescribed, in defined daily dosages (DDD), among 304 demented inhabitants. The diagnosis of dementia was ascertained by chart review and confirmed by administration of a mini mental status test.

Results: More than 90% of the demented patients had neuropsychiatric symptoms, most commonly apathy (78%). 52% were treated with neuroleptic drugs, 30% with antidepressants and 17% with anti-dementia agents. There was no significant difference between the frequency of neuroleptic treatment given to apathetic and depressed patients and that given to aggressive patients ($\chi^2 = 7.03$; $p = 0.32$).

Conclusion: Although our sample of patients was not representative, these findings suggest that neuropsychiatric symptoms in demented patients are not being treated in syndrome-specific fashion. This is troubling, because neuroleptic medications administered to demented patients can have serious adverse effects, including an elevated mortality. The German guidelines for the treatment of neuropsychiatric disturbances were recently published; the findings presented here suggest that their implementation would be advantageous.

All over the world, neuropsychiatric symptoms rank above cognitive disturbances as the most common indication for psychiatric treatment of patients with dementing diseases (1). The neuropsychiatric symptoms of patients with dementia comprise a heterogeneous group of traits (1–3); the more common types are aggressiveness, restlessness, apathy, and depression (4, 5). Aggressiveness and restlessness are often referred to in combination as “agitation” (5). Studies have revealed that one-third to three-quarters of all demented inhabitants of elderly homes have symptoms of these types (2, 3). 96% of the demented patients in a ten-year prospective longitudinal study displayed aggressive behavior (6); aggressive behavior impairs the patients’ quality of life (1, 2) and often causes stress for nursing personnel (2). Neuropsychiatric abnormalities in demented patients lead to increased costs, more frequent prescribing of psychoactive medications (2, 4, 7, 8), and more frequent hospitalization (1).

The neuropsychiatric symptoms of dementia tend to appear in the advanced stages of the disease; the risk of developing them increases in parallel with the severity of dementia (4). The question whether agitation might be an expression of depression in patients with advanced dementia is currently under discussion (9). On the other hand, agitation, depression, and apathy are all types of behavioral symptoms that can be induced by organic neuropathological changes (6). In studies from the USA (3) and Germany (8), there has been particular criticism of the frequent prescribing of neuroleptic drugs for an excessive period of time. Furthermore, symptoms of depression and apathy probably often remain undiagnosed (8–11). The American (10) and British (12) medical societies’ guidelines on the treatment of demented home residents recommend, as a first step, that the patients’ clinical symptoms should be properly evaluated, and then, as a second step, that they should be treated by the directed application of non-pharmacological and pharmacological interventions (Table 1) (8, 10, 12). The need for integration of preventive, non-pharmacological, and pharmacological measures was also explicitly pointed out at the 2008 annual meeting of the German Medical Association (13). In the present study, we estimated the point

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prevalences of three neuropsychiatric symptoms—agitation (aggressiveness and restlessness), depression, and apathy—and studied the syndrome-specific use of psychoactive drugs. In other words, we studied differences in the frequency of prescription of neuroleptic agents, antidepressants, anti-dementia drugs, benzodiazepines, and anticonvulsants for different target symptoms.

Methods

Sample

The data presented here are derived from an initial cross-sectional data collection in a cluster-cohort study involving 304 residents of 18 homes for the elderly in Berlin. The overall study addressed the issue of implementation of medical and nursing guidelines (project VIDEANT, BMG LT44–076). These 18 homes were the ones that agreed to participate in the study out of a total of 27 homes to which inquiries had been sent. Before the study was begun, it was approved by the ethics committee of the Charité Hospital, Berlin. All home residents for whom a diagnosis of dementia was documented in the elderly home's records were approached by their elderly home for written consent to participation in the study before any initial contact was made. This consent was obtained either from the patients themselves, or from a legally responsible third party. The primary criterion for inclusion was an existing medical diagnosis of dementia, independent of the presence or absence of neuropsychiatric symptoms. The diagnoses of dementia were extracted from the elderly homes' medical records.

A total of 647 elderly home residents and/or their legal representatives were contacted for possible participation in the study in the two months before the initial data collection. 23 of them died before the initial data collection took place. The authors received written consent to participation from 326 home residents; 298 either declined to participate, or did not respond to the inquiry. Thus, the initial sample comprised 326 persons.

Diagnoses of dementia

All 326 subjects underwent a mini mental status test (MMST [14]), and the existing medical diagnosis was confirmed with a threshold value of ≤ 24 points. 34 patients were unequivocally considered to be demented by the nursing staff, even though the home records contained no explicit medical diagnosis of dementia. For 19 of these 34 patients, further evaluation by the study physicians, who are experienced in geriatric psychiatry, led to a confirmation of the syndromic diagnosis of dementia on the basis of the clinical findings, the MMST, and the ICD-10 clinical criteria (15). The remaining 15 patients who were considered to be demented by the nursing staff did not meet the clinical criteria for dementia and were excluded from the study. Further exclusion criteria included a medically documented diagnosis of schizophrenia (2 patients) or bipolar disorder (4 patients). Another patient who carried

TABLE 1

Treatment guidelines for neuropsychiatric symptoms of dementia

Syndromes	Pharmacotherapy (AGS & AAGP 2003)	Pharmacotherapy (NICE 2008)
Depression		
– without psychotic symptoms	– Antidepressants, e.g., SSRI (e.g., citalopram, sertraline), SNRI (e.g., mirtazapine, venlafaxine); tricyclic agents are not agents of 1st choice!	– Antidepressants
– with psychotic symptoms	– Additionally, in the short term, atypical neuroleptic agents (e.g., risperidone, olanzapine, quetiapine)	– Tricyclic agents are not agents of 1st choice! – Additionally, in the short term, neuroleptic agents
Aggressiveness/agitation		
– without acute endangerment or psychotic symptoms	– No medication	– No medication, or ChE inhibitors
– with psychotic symptoms	– In the short term, atypical neuroleptic agents (risperidone, quetiapine); non-first-choice agents include typical neuroleptic agents, anticonvulsants, SSRI, benzodiazepines	– No neuroleptic agents for mild or moderate symptoms – Short-term use of neuroleptic agents for severe symptoms – For Lewy-body and Alzheimer dementia, neuroleptic agents only for strict indications

Recommendations of the American Geriatrics Society and the American Association for Geriatric Psychiatry (AGS & AAGP 2003) and of the National Institute for Health and Clinical Excellence (NICE 2008) regarding the pharmacotherapy of neuropsychiatric symptoms of dementia, particularly depression, aggressiveness, and agitation. SSRI, selective serotonin reuptake inhibitors. ChE, cholinesterase

the diagnosis of diminished intelligence was not included in the study either. The presence of depression in a patient carrying the diagnosis of dementia was not an exclusion criterion.

The remaining 304 study subjects carried the following diagnoses:

- dementia, not otherwise specified (n = 166),
- Alzheimer dementia (n = 57),
- vascular dementia (n = 62),
- Lewy-body dementia (n = 6),
- frontotemporal dementia (n = 3).

Most of the patients carrying the diagnosis of dementia had been so diagnosed by their family physician (70.4%), but some had been diagnosed by a specialist in psychiatry/psychotherapy, neurology, or neurology/psychiatry (29.6%).

Data collection

The demographic data were collected from December 2008 to February 2009 by the elderly homes' nursing staff, while the clinical data were collected by specially trained research assistants. The MMST (14) was used to assess the severity of dementia. Data on the symptoms of agitation were collected by questioning the nursing staff according to the standardized Cohen-Mansfield Agitation Inventory (5): This is a rating scale

TABLE 2

Averages and standard deviations

	Mean	Median	SD	Range
Age	81.56	84.00	± 10.52	54
MMST	8.59	8.00	± 7.99	24
DMAS	18.59	17.00	± 14.46	72
AES	51.61	52.00	± 11.19	48
CMAI	53.92	48.50	± 20.41	150
Typical agents	0.23	0.16	± 0.31	2.47
Atypical agents	0.26	0.19	± 0.24	1.13

Averages (means and medians) and standard deviations are given for patient age and for test results on the MMST (mini mental status test), DMAS (dementia mood assessment scale), AES (apathy evaluation scale), and CMAI (Cohen-Mansfield agitation inventory), as well as for defined daily dosages (DDD) of typical and atypical neuroleptic agents, for all home residents suffering from dementia (n = 304); SD, standard deviation

Point prevalences of neuropsychiatric symptoms: The percentage of demented home residents (n = 304) with apathy, agitation, and depression. The darker bars represent the overall prevalence of each symptom, and the lighter bars represent the prevalence of each one occurring in isolation, i.e., in the absence of the other two

FIGURE 1

for the symptoms of aggressiveness and restlessness, specifically in demented patients.

The quantification of other neuropsychiatric symptoms was performed with the aid of the Dementia Mood Assessment Scale (DMAS [16], which is a scale for the assessment of depressive symptoms that can be used in severely demented patients as well, as it relies on observation by an examiner, rather than on the patient's subjective replies) and the Apathy Evaluation Scale (AES [17], a scale for the assessment of apathy in demented patients).

Furthermore, an assessment with the Neuropsychiatric Inventory rating scale (NPI [18]) was performed by

trained raters in a subsample of 120 subjects in order to determine the external validity of the scales used in this study (DMAS, CMAI, AES). Satisfactory correlations were found between the NPI depression subscale and the DMAS ($r = 0.71$, $p < 0.001$), the NPI apathy subscale and the AES ($r = 0.76$, $p < 0.001$), and the NPI aggressiveness subscale and the CMAI ($r = 0.73$, $p < 0.001$). All three scales were applied during a two-week observation period, and the patients' neuropsychiatric symptoms were then classified on the corresponding symptom scales according to threshold values derived from the literature (5, 16, 17). The following threshold values were used:

- >42 points on the CMAI,
- >18 points on the DMAS,
- >40 points on the AES.

With respect to psychoactive drugs, the parameters "designation," "duration of use," and "daily defined dose" (DDD), relating to the medications that were prescribed over a period of two weeks, were extracted from the nursing records. A DDD of 1.0 for a neuroleptic medication corresponds to the mean recommended dose for young adult patients with schizophrenia. Thus, a DDD of 0.5 corresponds to 50% of this dose, and so forth.

Statistics

All statistical analyses were performed in SPSS or SAS. Post-hoc analyses of test strength were calculated with G-Power (Version 3.1, Institute for Experimental Psychology, University of Düsseldorf). In order to estimate the prevalence of neuropsychiatric symptoms, the frequency of agitation, depression, and apathy—where the presence of each of these was defined as a CMAI, AES, or DMAS exceeding the literature-derived threshold value—was recorded for the inhabitants of all 18 homes for the elderly, in terms of both absolute frequencies and percentages. Likewise, the frequency of use of each type of psychoactive drug was also recorded in terms of both absolute frequencies and percentages.

In order to study the syndrome-specificity of treatment with psychoactive drugs, an exploratory (i.e., non-hypothesis-driven) investigation was carried out, in view of the insufficient available literature on the subject (3, 7, 8). The relation between each type of neuropsychiatric symptom (or combination of neuropsychiatric symptoms) and each type of drug was determined from cross-tables. Chi-square tests were performed, and p-values below 0.05 were considered to be statistically significant. If a cell in a contingency table had a value less than 5, Fisher's exact test was applied, instead of a chi-square test.

The authors also performed linear regression analyses of each of the summed values (the AES, DMAS, and CMAI referred to above, adjusted for MMST, age, and sex), with the dependent variable "neuroleptic dose" (as a defined daily dose, DDD), in order to determine whether there was a significant correlation between the prescription of neuroleptic agents and the

presence of one or more of the neuropsychiatric symptoms under study. Finally, the authors also performed linear regression analyses with the dependent variable CMAI and the summed values of the DMAS—adjusted for MMST, age, and sex—in order to determine the influence of depressive symptoms on aggressiveness and restlessness.

Results

88 (28.9%) of the 304 elderly home residents studied were men, and 216 (71.1%) were women. *Table 2* shows the mean, median, standard deviation, and range of these patients' ages, their cognitive status, and the severity of each type of neuropsychiatric symptom that they had.

Among all elderly home residents carrying a diagnosis of dementia, the total prevalence of the neuropsychiatric symptoms apathy, depression, and agitation (i.e., aggressiveness, restlessness, or both) was 91.4% (278 out of 304 patients); in other words, only 26 patients (8.6%) displayed none of these symptoms. The partial prevalences were 248 (81.6%) for apathy, 190 (62.5%) for agitation, and 141 (46.4%) for depression. The prevalence of each of the three main types of neuropsychiatric symptoms occurring in the absence of the other two types ("in isolation") was 47 (15.5%) for apathy, 13 (4.3%) for agitation, and 8 (2.6%) for depression (*Figure 1*).

There was a large amount of overlap between the different clinical symptom groups (*Table 3*).

Neuroleptic agents were prescribed for 159 (52.3%) of the demented home residents: 64 (21.1%) were given a typical neuroleptic agent, and 11 (3.6%) were given two different typical neuroleptic agents. 53 (17.4%) patients received a newer neuroleptic agent (a neuroleptic agent of the second generation, i.e., a so-called atypical neuroleptic agent), 7 (2.3%) received two of these at the same time, and 2 (0.7%) received three of these at the same time. 22 (7.2%) patients received a combination of typical and atypical neuroleptic agents. Antidepressants were prescribed for 92 (30.3%) of the patients, anti-dementia drugs for 53 (17.4%), benzodiazepines for 21 (6.9%), and anticonvulsants for 52 (17.1%).

The frequency of prescription of the various classes of medication is shown in *Figure 2* and classified by neuropsychiatric symptoms in *Figure 3*.

In particular, no significant differences were found between patients who had neuropsychiatric symptoms including agitation, and those who had neuropsychiatric symptoms not including agitation, with respect to the classes of substances used and the defined daily doses (DDD) prescribed. The relations between types of symptoms and substance classes are shown in *Figure 3* and *Table 4*.

In the regression analyses (*Table 5*), none of the substance groups studied was found to have a significant relationship to any particular target indication. Depression, as measured by the DMAS, was significantly correlated with the total score in the Cohen-Mansfield

TABLE 3

Comorbidity of neuropsychiatric symptoms

Neuropsychiatric symptoms in demented patients	Number (n) and proportion (%)
None	n = 26 (8.6%)
Apathy only	n = 47 (15.5%)
Agitation only	n = 13 (4.3%)
Depression only	n = 8 (2.6%)
Depression and apathy	n = 33 (10.9%)
Agitation and depression	n = 9 (3.0%)
Agitation and apathy	n = 77 (25.3%)
Apathy, agitation and depression (all 3)	n = 91 (29.9%)

The number and percent of the home residents with dementia suffering from different types of neuropsychiatric symptoms; percentages are in relation to the total number of demented patients studied (n = 304)

FIGURE 2

The percentage of demented home residents under treatment with different medications (%)

Prescribing practices for psychoactive drugs: The percentage of demented home residents studied (n = 304) being treated with each class of psychoactive drug. The five most common substance classes are indicated: neuroleptic agents, antidepressants, anti-dementia drugs, benzodiazepines, and anticonvulsants

Agitation Inventory (CMAI) ($\beta = 0.20$, $p < 0.001$). Thus, the total DMAS score accounted for 4% of the variance in the total CMAI score.

Discussion

This study addressed the prevalence of neuropsychiatric symptoms among the demented residents of 18 homes for the elderly. Particular attention was paid to agitation, apathy, and depression. The high overall prevalence of such symptoms that was found in this study (over 90%) is higher than that found in previous studies performed in Germany and elsewhere (2–5, 19). The different symptoms also overlapped to a large

FIGURE 3

Neuropsychiatric symptoms and the prescribing of psychoactive medications. The figure shows the percentage of patients with each type of neuropsychiatric symptom receiving each type of drug

extent: The regression analyses showed, for example, that depressive symptoms accounted for a significant percentage of the variance in agitation. Depressive symptoms are thus associated with agitation. This can be taken as evidence for the occurrence of non-remitting agitated depression (9).

A central finding of this study concerns the psychopharmaceutical prescribing practices in the elderly homes that were studied. A large majority of the demented study participants were receiving psychoactive medications, among which typical and atypical neuroleptics were given at an especially high frequency (52.3% combined) (Figures 2 and 3). In contrast, markedly fewer patients were receiving antidepressants (30.3%) or anti-dementia drugs (17.4%). Furthermore, patients suffering from depression or apathy as an isolated neuropsychiatric symptom did not differ to any significant extent from aggressive and restless patients with respect to the frequency of treatment with neuroleptic and antidepressant drugs. The overall impression arises that the treatment of demented elderly-home residents with psychoactive medications is not particularly syndrome-specific (10, 12). This is a cause for concern, as many of the typical neuroleptics and many of the

TABLE 4

Neuropsychiatric symptoms in demented patients: breakdown by particular symptoms and types of drug taken

	Apathy only	Depression only	Agitation only	Depression and apathy	Agitation and depression	Agitation and apathy	All 3 symptoms
Neuroleptic agent	20	6	7	15	5	43	56
No neuroleptic agent	27	2	6	18	4	34	35
Fisher's exact test	df = 6, p = 0.32						
Antidepressant	13	2	3	10	2	23	31
No antidepressant	34	6	10	23	7	54	60
Fisher's exact test	df = 6; p = 0.98						
Anti-dementia drug	10	2	2	6	2	19	12
No anti-dementia drug	37	6	11	27	7	58	79
Fisher's exact test	df = 6; p = 0.58						
Benzodiazepines	4	2	2	4	0	2	5
No benzodiazepines	43	6	11	29	9	75	86
Fisher's exact test	df = 6; p = 0.08						
Anticonvulsants	6	1	3	6	2	10	17
No anticonvulsants	41	7	10	27	7	67	74
Fisher's exact test	df = 6; p = 0.85						

For each type of neuropsychiatric symptom (agitation, depression, apathy, and all possible combinations of these), the table indicates the number of home residents with this type of symptom who were taking each class of drug (neuroleptic agents, antidepressants, anti-dementia drugs, benzodiazepines, and anticonvulsants). Two-tailed p-values for Fisher's exact test are also given. 26 patients had no neuropsychiatric symptoms

TABLE 5

Neuropsychiatric symptoms in demented patients in relation to age, sex, and cognitive status

	CMAI	DMAS	AES
Age	$\beta = 0.37$; $T = 1.133$; $p = 0.28$	$\beta = -0.08$; $T = -0.27$; $p = 0.79$	$\beta = -0.19$; $T = -0.67$; $p = 0.52$
Sex	$\beta = 0.25$; $T = 1.04$; $p = 0.32$	$\beta = -0.06$; $T = -0.28$; $p = 0.79$	$\beta = 0.42$; $T = 1.99$; $p = 0.07$
MMST	$\beta = -0.23$; $T = -0.81$; $p = 0.44$	$\beta = -0.61$; $T = -2.30$; $p = 0.04$	$\beta = -0.69$; $T = -2.71$; $p = 0.02$
Typical neuroleptic agents	$\beta = -0.31$; $T = -1.11$; $p = 0.29$	$\beta = 0.22$; $T = 0.87$; $p = 0.40$	$\beta = -0.12$; $T = -0.48$; $p = 0.64$
Atypical neuroleptic agents	$\beta = 0.50$; $T = 2.04$; $p = 0.07$	$\beta = -0.15$; $T = -0.67$; $p = 0.51$	$\beta = -0.13$; $T = -0.61$; $p = 0.55$

Results of 3 regression analyses. Each row stands for one of the following independent variables: age, sex, total MMST score, and prescription of typical and atypical neuroleptic agents. Each column stands for one of the following dependent variables: total AES score, total DMAS score, and total CMAI score. The results are stated in terms of the β -coefficient, T-value, and statistical significance (p-value). CMAI, Cohen-Mansfield agitation inventory; DMAS, dementia mood assessment scale; AES, apathy evaluation scale; MMST, mini mental status test

TABLE 6

Treatment with neuroleptic agents in demented home residents with and without sleep disturbances and with and without symptoms of anxiety*

	Sleep disturbance	No sleep disturbance	Symptoms of anxiety	No symptoms of anxiety
Treatment with neuroleptic agents	22	41	31	34
No treatment with neuroleptic agents	27	30	27	28
		$\chi^2 = 1.91$, $p = 0.16$		$\chi^2 = 0.02$, $p = 0.89$

* As measured by the Neuropsychiatric Inventory (NPI) (n = 120). In the subsample, the frequency of neuroleptic treatment was found not to depend to any statistically significant degree on the presence or absence of sleep disturbances or symptoms of anxiety

newer substances have not been approved for the treatment of neuropsychiatric disturbances in demented patients. On the other hand, the relatively low frequency of benzodiazepine prescriptions is a positive finding, in view of the heightened potential of these drugs to cause falls, injuries, and delirium (20).

Limitations of this study

This study is not representative with respect to the selection of the homes for the elderly, or of the demented patients living in them. The fact that about 50% of the initially approached patients declined to participate in the study, combined with the very high prevalence of neuropsychiatric symptoms, suggests that patients with severe dementia and severe neuropsychiatric symptoms were more likely to be included in the study than other patients. The study findings are thus primarily applicable to patients whose neuropsychiatric disturbances are severe.

A further limitation is the lack of a specific diagnosis of the dementing condition (e.g., Alzheimer dementia) for the majority of the study participants (54.6%). In particular, it is possible that some patients who were

actually demented, but had not been diagnosed as being demented, were not included in the study. In fact, dementia was diagnosed by the study physicians using the clinical examination and MMST in 19 patients who were considered to be demented by the nursing staff, but had not been medically diagnosed as such. The study is open to the methodological criticism that these medical diagnoses were assigned clinically rather than in operationalized fashion, and also that the validity of the MMST may be lower in the presence of severe depression and apathy.

In this study, particular types of neuropsychiatric symptoms were said to be present or absent on the basis of scores on rating scales that were determined by non-physician raters, and this information was then used to judge the syndrome-specificity of pharmacotherapy and thus the appropriateness of prescribing practices. It is clear that the results obtained may differ from those that would have been found if the presence or absence of these symptoms had been diagnosed by physicians instead. Be that as it may, the validity of the rating scales has been confirmed in multiple previous studies (5, 14, 16–18) and was also checked against the

Neuropsychiatric Inventory (NPI) in a subgroup of participants in our own study.

Yet another limitation is that there are other indications for neuroleptic drugs that tend to be more common in demented patients, e.g., sleep disturbances and anxiety. These symptoms, however, were sought in the subgroup of study participants in whom the rating scales that we used were validated against the NPI, and they were found to have no relation to the frequency of neuroleptic prescriptions. In particular, there was no difference in the frequency of neuroleptic prescriptions among demented patients with or without sleep disturbances ($n = 120$, $\chi^2 = 1.91$, $p = 0.16$) and with or without symptoms of anxiety ($n = 120$, $\chi^2 = 0.02$, $p = 0.89$), as measured with the NPI (Table 6). In a post-hoc analysis, we found a power of $1 - \beta = 0.85$ for an effect of intermediate strength ($w = 0.30$); thus, the power of this test was satisfactory.

Being cross-sectional, the present study cannot distinguish with certainty between two possibilities: that a neuropsychiatric symptom was the original indication for a particular psychoactive drug, or, alternatively, that it arose as an adverse effect after treatment with the drug was initiated. Thus, neuroleptic-induced psychomotor side effects such as akathisia may have accounted for some of the prevalence of agitation that was found.

Multiple earlier publications have addressed the problems associated with neuroleptic treatment for demented patients with neuropsychiatric symptoms (8, 11, 12, 21). The use of neuroleptic drugs in older patients with dementing diseases carries an elevated risk of adverse effects, among them extrapyramidal motor disturbances (22), an elevated cardiovascular risk (21), and an elevation of mortality by as much as 70% for long-term treatment (11).

Nor are neuroleptic drugs always agents of first choice, even for the treatment of agitation (3, 4, 8, 10). Although anti-dementia drugs are usually used to treat mild or moderate dementia, there is evidence that they can be an effective treatment for agitation and apathy, precisely in patients who suffer from mild or moderate dementia (12, 19, 23, 24). For the treatment of apathetic symptoms, the most commonly recommended medications are anti-dementia drugs (cholinesterase inhibitors) and antidepressants (12, 23).

In this study, we found neuropsychiatric symptoms to be present at a very high prevalence among the demented residents of 18 homes for the elderly in Berlin. In this group of very ill patients, however, we found that the pharmacotherapy of neuropsychiatric symptoms was not very syndrome-specific (10, 12). Psychoactive medications should be prescribed for strict indications in this patient group, and alternative treatment options should be given due consideration, not least because neuroleptic drugs are known to elevate the cardiac mortality of demented patients (11, 21). The medical societies in the United States (10) and the United Kingdom (12) have already published guidelines on this subject. New guidelines for the German-speaking

countries have just appeared (25), and it would be highly desirable for them to be properly implemented and firmly anchored in routine clinical practice.

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Conflict of interest statement

Dr. Rapp has received lecture fees from the GlaxoSmithKline, Servier, Pfizer, and Janssen-Cilag companies.

Professor Heinz has received lecture fees and industrial research sponsoring from the Eli Lilly, GlaxoSmithKline, Janssen-Cilag, Servier, and Bristol-Myers-Squibb companies.

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Corresponding author

Dr. phil. Dr. med. Michael A. Rapp
 Klinik für Psychiatrie und Psychotherapie
 Charité Campus Mitte
 Charitéplatz 1
 10117 Berlin, Germany
michael.rapp@charite.de