Use of antipsychotic medications in older home-care patients. Report from nine European countries

Hanna-Mari Alanen[1], Harriet Finne-Soveri[2], Daniela Fialova[3], Eva Topinkova[3,4], Palmi V. Jonsson[5], Liv Wergeland Soerbye[6], Roberto Bernabei[7], and Esa Leinonen[1,8]

[1]University of Tampere, Medical School, Tampere, Finland, [2]STAKES, Center for Health Economics CHESS, Helsinki, Finland, [3]Department of Geriatric Medicine, 1st Faculty of Medicine, Charles University, Prague 2, Czech Republic, [4]Institute of Postgraduate Medical Education, Prague, Czech Republic, [5]Department of Geriatrics, Landspitali-University Hospital, Reykjavik, Iceland, [6]Diakonhjemmet University College, Oslo, Norway, [7]Università Cattolica del Sacro Cuore, Rome, Italy, [8]Department of Psychiatry, Tampere University Hospital, Pitkäniemi, Finland

ABSTRACT. *Background and aims*: Data on the use of antipsychotics among older people in need of regular home care services are rare. The aim of this study was to ascertain the differences in the use and type of antipsychotic medications between European home-care sites. *Methods*: A cross-sectional study was designed by means of RAI (Resident Assessment Instrument for Home Care) assessments. A random sample of 3215 assessments was gathered during the period September 2001-January 2002 from home care patients aged 65 and over in nine European countries (Czech Republic, Denmark, Finland, Germany, Iceland, Italy, Netherlands, Norway and United Kingdom). *Results*: Two hundred of the home care patients (6.2%) received antipsychotic medication. The prevalence of the use of one or more antipsychotics varied widely between study sites, ranging from 3.0% in Denmark to 12.4% in Finland. Factors independently associated with the use of antipsychotics were: delusions (OR 3.09, 95% CI 1.66-5.76), any diagnosis of dementia (OR 2.57, 95% CI 1.70-3.87), youngest age group (65-74 yrs) (OR 2.37, 95% CI 1.53-3.66) and hallucinations (OR 2.28, 95% CI 1.17-4.45). Concomitant use of anxiolytics (OR 2.32, 95% CI 1.58-3.41), hypnotics (OR 2.08, 95% CI 1.44-3.03) and antidepressants (OR 2.06, 95% CI 1.41-3.00) together with signs of depression (OR 1.78, 95% CI 1.24-2.56), moderate to severe cognitive impairment (OR 1.30, 95% CI 1.12-1.51) and residing in Finland (OR 2.52, 95% CI 1.21-5.24) or Italy (OR 2.15, 95% CI 1.10-4.19) were associated with the use of antipsychotics. The most commonly used antipsychotic agent was risperidone (n=42, 21%). *Conclusions*: The frequency of antipsychotic drug use in older home-care pa-

tients varied considerably among the European countries studied. Antipsychotic drug treatment in older home-care recipients seems to be less common than in residents in long-term institutional care, and more common than among the independently-living elderly. (*Aging Clin Exp Res 2008; 20: ###-###*)
©2008, Editrice Kurtis

INTRODUCTION

Home-care may become necessary when the functional or cognitive capacities of older persons deteriorate. Cognitive impairment and also psychotic symptoms may impair everyday functioning capacity (1, 2). It has been reported that the point prevalence of having psychotic symptoms ranges from 3.2% to 5.7% in elderly people living in the community (3, 4) to 10% in the very old population (5) and up to 41% in patients with Alzheimer's disease (6). In addition to cognitive impairment, the risk factors for psychotic symptoms may be social isolation, depressive symptoms, using psychotropic drugs, sensory deficits, and intake of community care (3, 7).

Studies from various countries have documented a high use of antipsychotic medications, (15-42%) among elderly people in long-term institutional care (8-11). The proportion of patients taking antipsychotics among the home-dwelling elderly varies at 3-9% (12-16). Antipsychotics are used six times more commonly in demented individuals than in non-demented subjects (12, 14). Associations between the use of antipsychotics and the level of cognitive functioning and the activities of daily living in elderly patients have been negative or positive (17-20). Epidemiological studies have shown progressively increasing intake of antipsychotics with increasing age (21-23).

There has been concern about the use of antipsychotics in long-term care for older people because of inappropriate prescribing and the risks of adverse effects. Home-care patients represent the population between healthy community-dwelling elderly individuals and elderly people in long-term residential care. Data on the use of antipsychotics among older people in need of regular home-care services are rare. The aim of this study was to ascertain the differences in frequency of use and type of antipsychotic medications and associated factors among elderly people using home care services in nine European countries.

METHODS

The Aged in Home Care (AdHOC) Study was designed to compare outcomes of different models of community care by means of a structured comparison of services and a comprehensive standardized assessment instrument (24). The present data were derived from AdHOC during the period 2001-2002 in 11 European countries, from which information from two countries were excluded, due to lack of data on medication or inconsistent recording of antipsychotics. In addition, those who were no longer resident in their original homes or who were temporarily residing in institutional-type settings at the time of the assessment were excluded. The samples in each of the countries were gathered from identified municipalities providing formal home-care services, and a population considered representative of the country's urban area was selected. The participating home-care clients were randomly selected from home-care agencies serving a certain geographical area. This register led to the creation of a cross-national population-based data-set containing information on 3251 assessments of subjects aged 65 years or more already receiving home-care services.

The data collection method was the Resident Assessment Instrument for Home Care (RAI-HC version 2.0), a well-validated and reliability-tested questionnaire (25). At each of the sites in each of the countries nurses were uniformly trained in how to use the questionnaire with the help of the manual (26), and all clients were assessed once. In addition to interviewing and observing patients, data were collected from medical and nursing documentation and from patients' caregivers, including home-care professionals.

The MDS-HC (Minimum Data Set for Home Care) instrument consists of more than 350 items, including sociodemographic and social relationship variables (e.g., age, sex, living alone, amount of time alone during the day, lack of informal helper), functional, cognitive and mood status characteristics, as well as other relevant clinical information such as medical diagnoses and medications (27). The diagnoses (ICD-10) for the assessments were taken from medical records as recorded by the treating physicians (mostly general practitioners). Medical diagnoses were only noted if they were the subject of active treatment or monitoring if they affected patients' functional or cognitive skills, or if they had an impact on prognosis. To assess depression, the Depression Rating Scale (DRS, scale 0-14) was constructed and for scores of 3 or more, suspicion of clinical depression was noted according to Burrows et al. (28). Functional capacity was determined by calculating a hierarchical ADL score (score 0-6, where 0=independent and 6=totally dependent). Cognition was assessed by the Cognitive Performance Scale (CPS, score 0-6, where 0=normal, and 6=very severe impairment), where scores greater than zero represented cognitive impairment (29).

Information on medication included generic name and Anatomical and Therapeutic Chemical code (ATC). Apart from medications for dizziness and/or nausea, and lithium, all medications with an ATC code of N05A were coded as antipsychotics. Then the antipsychotic medications were divided into typical (chlorpromazine, flupentixol, haloperidol, levomepromazine, melperone, pericyazine, pipamperone, promazine, sulpiride, tiapride, zuclopentixol) and atypical antipsychotics (amisulpiride, clozapine, olanzapine, quetiapine, risperidone).

All statistical analyses were performed with SAS version 8.2 (SAS Institute, Cary, NC). After explanatory variables had been chosen, the associations of antipsychotic use with these variables were tested by chi-square tests for dichotomous variables and the t-test for continuous variables, to identify crude associations for antipsychotic use. Statistically significant ($p<0.05$) factors according to these tests were then included one by one in a logistic regression model, in a series of multiple separate analyses. The site at which the frequency of antipsychotic use was lowest was used as a reference. After testing associations between chosen variables and total number of antipsychotics, the same tests were performed with typical and atypical antipsychotics separately as the dependent variable.

Informed consent was requested from participants, according to legislation in force in the respective countries.

RESULTS

The mean age of the individuals in the sample was 82.2 years (±7.3) (range 65-104) and 74.4% were women. Sociodemographic and main clinical characteristics of the patients and the use of antipsychotics are listed in Table 1. The proportion of patients who had been prescribed one or more antipsychotics was 6.2% of the study population. Of the 200 individuals receiving any type of antipsychotic medication, 73 (37%) were treated with atypical antipsychotics and 132 (66%) with typical antipsychotics. Thus, 5 individuals (2.5%) received both types simultaneously. There was no difference between sexes in the use of antipsychotics.

Table 1 - *Sociodemographic and clinical characteristics of older home care recipients and use of antipsychotic medication 2001-2002, n=3215.*

	n	%	On antipsychotics (%)	p-value*
Age group				
65-74	574	17.7	9.6	0.0002
75-84	1439	44.3	6.2	0.9445
85+	1238	38.1	4.5	0.0024
Sex				
Women	2419	74.4	5.9	0.3307
Men	832	25.6	6.9	
Living arrangements				
Living alone	2000	61.5	5.3	0.0043
Primary caregiver living with patient	963	29.6	8.5	0.0003
Documented diagnoses				
Stroke with or without hemiplegia	513	15.8	5.5	0.4760
Any dementia	399	12.3	17.0	<0.0001
Parkinsonism	160	4.9	10.6	0.0157
Any psychiatric diagnosis	103	3.2	12.6	0.0055
Psychiatric and behavioral symptoms				
Delusions	76	2.3	31.6	<0.0001
Hallucinations	80	2.5	26.3	<0.0001
Reason to suspect depression (DRS=3+)§	523	16.1	12.1	<0.0001
Wandering	25	0.8	32.0	<0.0001
Verbally abusive	21	0.7	19.1	0.0136
Physically abusive	8	0.3	37.5	0.0002
Socially disruptive	12	0.4	25.0	0.0065
Resists care	33	1.0	9.1	0.4800
Any behavioral problem	74	2.3	20.3	<0.0001
Use of medications				
Antidepressants	485	14.9	12.4	<0.0001
Anxiolytics	362	11.1	14.4	<0.0001
Hypnotics	639	19.7	9.7	<0.0001
Anticholinesterase medications	49	1.5	16.3	0.0028
Use of more than 5 medications	1978	60.8	7.2	0.0014
Use of more than 9 medications	668	20.6	7.5	0.1077
Cognition and physical functions				
Impaired cognition# (CPS>0)				
CPS 0	1730	53.2	3.4	<0.0001
CPS 1-2	930	28.6	6.8	
CPS 3-6	591	18.2	13.4	
Impaired physical functions## (ADL>0)				
ADL 0	2262	69.6	5.0	<0.0001
ADL 1-2	351	10.8	5.7	
ADL 3-6	638	19.6	10.5	

*χ^2 -tests, compared with the rest of population. §DRS, Depression Rating Scale: ≥3 indicates depression. #CPS, Cognitive Performance Scale: 0 no cognitive impairment, 1-2 mild cognitive impairment, 3-6 moderate to severe cognitive impairment. ##ADL, Activities of Daily Living Scale: 0 no dependence on assistance with daily living, 1-2 mild degree of dependence on assistance with daily living, 3-6 moderate to severe degree of dependence on assistance with daily living.

The prevalence of the use of one or more antipsychotics varied widely among the sites studied, from 3.0% in Denmark to 12.4% in Finland (Table 2). Prevalences are given separately by site for patients taking typical and atypical antipsychotics. Of the antipsychotics, risperidone was prescribed most commonly (n=42, 20.9%), haloperidol was second (n=32, 15.9%), and olanzapine third (n=21, 10.5%), followed by melperone (n=19, 9.5%).

All the significant univariate results were included in the logistic regression model, which identified factors significantly independently associated with the use of antipsychotics among home-care recipients. They were: delusions, any diagnosis of dementia, hallucinations, depression, moderate to severe cognitive impairment, age group from 65 to 74 years, use of anxiolytics, antidepressants and hypnotics, or being resident in Finland or Italy (Table 3). The odds ratios are given in Table 3 separately for patients taking atypical and typical antipsychotics.

DISCUSSION

The main finding in this study was the wide variation (from 3 to 12%) in the use of antipsychotics among elderly home-care recipients among the samples collected from nine European countries. The use of antipsychotics in the total sample was 6.2%, which is in line with earlier reports on home-dwelling elderly people (3 to 9%) (12-16). However, consumption was higher than has been reported in the general population (1.0-1.4%) (21-23).

Table 2 - *Prevalences by site for patients taking typical and atypical antipsychotics.*

	Total n	On antipsychotics n (%)	Typical	Atypical
Czech Republic	366	16 (4.4)	16 (100%)	0 (0%)
Denmark	461	14 (3.0)	8 (57%)	6 (43%)
Finland	186	23 (12.4)	17 (74%)	6 (26%)
Germany	602	43 (7.1)	32 (74%)[#]	13 (32%)
Iceland	404	23 (5.7)	11 (48%)[#]	13 (57%)
Italy	403	45 (11.2)	27 (60%)[#]	19 (42%)
Netherlands	157	7 (4.5)	3 (43%)	4 (57%)
Norway	385	14 (3.6)	10 (71%)	4 (29%)
UK	287	15 (5.2)	8 (53%)[#]	8 (53%)
Total	3251	200 (6.2)	132 (66%)[#]	73 (37%)

[#]Typical and atypical antipsychotics were given simultaneously in some cases.

The use of antipsychotic medication among elderly home-care recipients in Finland and Italy was more than twice as common as in Denmark, when adjusted for confounders. This wide range is primarily attributable to the differences in health-care systems and in-care practices, or to different attitudes to antipsychotic therapy in the various countries. In accordance with the present results, a high prevalence of antipsychotic drug use in the elderly has also been reported in institutional care in both Finland and Italy (11, 30, 31).

Diagnoses of dementia and cognitive impairment were associated generally with the use of both atypical and typical antipsychotics in the sample population. Intake was high in the group of cognitively impaired patients (13.4%) and even higher in the group for whom a diagnosis of dementia was documented (17.0%). These proportions, however, were lower than those previously reported in demented home-dwelling elderly people (32.5%) (14) or those in long-term residential care (41.0-44.7%) (11, 30). In the present study, subjects with moderate to severe cognitive impairment took four times more antipsychotics than cognitively sound patients (13.4 *vs* 3.4%). Some earlier studies have reported even higher differences between demented and non-demented individuals (12, 14). Although only 12.3% of the present subjects had a diagnosis of dementia, approximately one out of two patients had some degree of cognitive impairment. This suggests that many of these patients had not been carefully diagnosed.

Table 3 - *Antipsychotic medication use in older home-care patients in nine European countries. Results of a logistic regression model.*

	All antipsychotics Odds ratio (95% CI[*])	Atypical Odds ratio (95% CI)	Typical Odds ratio (95% CI)
Delusions	3.09 (1.66-5.76)	3.72 (1.63-8.50)	1.99 (0.93-4.09)
Diagnosis of dementia	2.57 (1.70-3.87)	2.55 (1.34-4.87)	2.11 (1.30-3.42)
Age 65-74	2.37 (1.53-3.66)	3.75 (1.88-7.47)	1.43 (0.85-2.40)
Anxiolytics	2.32 (1.58-3.41)	1.74 (0.96-3.18)	2.32 (1.48-3.63)
Hallucinations	2.28 (1.17-4.45)	1.39 (0.50-3.91)	2.31 (1.11-4.78)
Hypnotics	2.08 (1.44-3.03)	2.83 (1.61-4.98)	1.44 (0.91-2.29)
Antidepressants	2.06 (1.41-3.00)	2.36 (1.32-4.22)	1.76 (1.11-2.79)
Depression	1.78 (1.24-2.56)	1.34 (0.76-2.36)	1.99 (1.31-3.04)
Impaired cognition	1.30 (1.12-1.51)	1.33 (1.04-1.70)	1.25 (1.05-1.49)
Finland[#]	2.52 (1.21-5.24)	2.28 (0.66-7.85)	3.82 (1.56-9.36)
Italy	2.15 (1.10-4.19)	4.97 (1.84-13.41)	2.16 (0.93-5.05)
Germany	1.59 (0.82-3.07)	2.67 (0.96-7.45)	2.09 (0.92-4.74)
UK	1.06 (0.48-2.35)	3.17 (1.04-9.67)	1.02 (0.37-2.86)
Netherlands	1.02 (0.38-2.74)	3.31 (0.87-12.66)	0.80 (0.20-3.15)
Norway	0.99 (0.46-2.15)	1.50 (0.41-5.54)	1.30 (0.50-3.37)
Iceland	0.95 (0.46-1.94)	2.75 (0.98-7.73)	0.92 (0.35-2.38)
Czech Republic	0.78 (0.34-1.69)	1.00	1.48 (0.60-3.64)

[*]CI, confidence interval; [#]Compared with Denmark. Statistically significant values in bold type.

Psychotic symptoms and depression have also been associated with the use of antipsychotics in several earlier studies (8, 12). As expected, both delusions and hallucinations are associated with the use of antipsychotics, and hallucinations with typical and delusions with atypical antipsychotics. The reason for this variation is unknown, but may be associated with prescription procedures and traditions. Only one-third of subjects with these psychotic symptoms were on antipsychotic treatment, which matches one earlier report (5). Because the psychotic symptoms in this population are relatively rare (around 4%), the use of antipsychotics in this group makes only a minor contribution to the present results in general. Depression is also associated with the use of antipsychotics. Altogether, 12% of the present patients with depression symptoms were taking antipsychotics. This may match the estimated proportion of psychotic depression in this depressive population (32, 33).

In this study, the risk of receiving antipsychotic treatment was more common in the youngest age group (65-74 yrs). This may conflict with previous reports in which the likelihood of using antipsychotics increased linearly with age (14, 21-23). In some studies, however, the frequency of antipsychotic use is lower among the oldest age groups (8, 30). One explanation for the fact that the youngest age group in the present study received antipsychotics more commonly than the older ones may be associated with more frequent or more troublesome socially disruptive behaviour among the youngest patients. Thus, these medications may have been given for social control reasons. Elderly men in residential care have been reported to receive more antipsychotics than women (8, 20). In the present study, no difference was found between sexes in the use of antipsychotics.

In 2001-2002, atypical antipsychotics were considered to be the first-line therapy in the elderly and for behavioural and psychotic symptoms of dementia, with a lower risk of the most adverse effects (34). Contrary to expectations, two out of three patients on antipsychotics in the present study were prescribed conventional drugs. In most of the previous studies outside Europe, the ratio of atypical to conventional antipsychotic use is 3:2 or 2:1 (8, 9, 35, 36), although these reports came from studies on elderly residents in long-term institutional care. Variations between countries in the ratio of atypical to typical antipsychotic use may be due to the different costs and national reimbursement policies as well as to prescription rules and procedures. In some countries, only psychiatrists may prescribe atypical antipsychotics. In 2001-2002, there were no special restrictions on prescription or reimbursement policies regarding atypical antipsychotics in Finland but in Italy reimbursement can be obtained only if a doctor makes out prescriptions on authorized forms. However, variations in reimbursement policies cannot explain the especially high use of typical antipsychotics in Finland and atypical antipsychotics in Italy (Table 3).

LIMITATIONS

This study includes some limitations. Unfortunately, it was not possible to establish the chronological order of any associations, because of the cross-sectional nature of the study. Although the MDS-HC is a standardized, comprehensive assessment instrument, recording of psychiatric symptoms is not its main focus. Psychiatric symptoms were assessed by home-care staff (including the attending physician), and some potential for over- and underestimation remains. In addition, these data did not include any severity assessment of psychotic or behavioural symptoms, nor were individual indications for antipsychotic drug use included in the data. The possibility of unexplored predictors of antipsychotic use, such as costs and prescription procedures, may have contributed to the results. Originally, 11 European countries were included in AdHOC. However, the generic names and drug doses of antipsychotics were not available in the data of Sweden and France, which were thus excluded from the present analyses. Data were complete for the remaining nine countries. As the sample population consisted solely of medically ill older adults requiring home-care services, these findings cannot be generalized to other populations.

CONCLUSIONS

The frequency and type of antipsychotic drug use in elderly home-care patients varied considerably between the nine European countries studied. In general, antipsychotic drug treatment in this population seems to be less common than in residents in long-term residential care, and is approximately as common as in the independently living elderly. Certain factors such as delusions, hallucinations, depression, dementia, and cognitive impairment, as well as the youngest age group and the concomitant use of other psychotropics explain the use of antipsychotics. Residing in Finland and Italy was also a risk indicator.

REFERENCES

1. Twamley EW, Doshi RR, Nayak GV, et al. Generalized cognitive impairments, ability to perform everyday tasks, and level of independence in community living situations of older patients with psychosis. Am J Psychiatry 2002; 159: 2013-20.

2. McGuire LC, Ford ES, Ajani UA. Cognitive functioning as a predictor of functional disability in later life. Am J Geriatr Psychiatry 2006; 14: 36-42.

3. Henderson AS, Korten AE, Levings C, et al. Psychotic symptoms in the elderly: a prospective study in a population sample. Int J Geriatr Psychiatry 1998; 13: 484-92.

4. Forsell Y, Palmer K, Fratiglioni L. Psychiatric symptoms/syndromes in elderly persons with mild cognitive impairment. Data from a cross-sectional study. Acta Neurol Scand Suppl 2003; 179: 25-8.

5. Östling S, Skoog I. Psychotic symptoms and paranoid ideation in a nondemented population-based sample of the very old. Arch Gen Psychiatry 2002; 59: 53-9.

6. Ropacki SA, Jeste DV. Epidemiology of and risk factors for psychosis of Alzheimer's disease: a review of 55 studies published from 1990 to 2003. Am J Psychiatry 2005; 162: 2022-30.

7. Forsell Y, Henderson AS. Epidemiology of paranoid symptoms in an elderly population. Br J Psychiatry 1998; 172: 429-32.

8. Lövheim H, Sandman PO, Kallin K, Karlsson S, Gustafson Y. Relationship between antipsychotic drug use and behavioral and psychological symptoms of dementia in old people with cognitive impairment living in geriatric care. Int Psychogeriatr 2006; 18: 713-26.

9. Liperoti R, Mor V, Lapane KL, Pedone C, Gambassi G, Bernabei R. The use of atypical antipsychotics in nursing homes. J Clin Psychiatry 2003; 64: 1106-12.

10. Snowdon J, Day S, Baker W. Current use of psychotropic medication in nursing homes. Int Psychogeriatr 2006; 18: 241-50.

11. Alanen HM, Finne-Soveri H, Noro A, Leinonen E. Use of antipsychotic medications among elderly residents in long-term institutional care: A three-year follow-up. Int J Geriatr Psychiatry 2006; 21: 288-95.

12. Giron MS, Forsell Y, Bernsten C, Thorslund M, Winblad B, Fastbom J. Psychotropic drug use in elderly people with and without dementia. Int J Geriatr Psychiatry 2001; 16: 900-6.

13. Linjakumpu T, Hartikainen S, Klaukka T, Koponen H, Kivelä SL, Isoaho R. Psychotropics among the home-dwelling elderly - increasing trends. Int J Geriatr Psychiatry 2002; 17: 874-83.

14. Hartikainen S, Rahkonen T, Kautiainen H, Sulkava R. Use of psychotropics among home-dwelling nondemented and demented elderly. Int J Geriatr Psychiatry 2003; 18: 1135-41.

15. Rapoport M, Mamdani M, Shulman KI, Herrmann N, Rochon PA. Antipsychotic use in the elderly: Shifting trends and increasing costs. Int J Geriatr Psychiatry 2005; 20: 749-53.

16. Linden M, Bar T, Helmchen H. Prevalence and appropriateness of psychotropic drug use in old age: results from the Berlin Aging Study (BASE). Int Psychogeriatr 2004; 16: 461-80.

17. Robertson J, Emerson E, Gregory N, et al. Lifestyle related risk factors for poor health in residential settings for people with intellectual disabilities. Res Dev Disabil 2000; 21: 469-86.

18. Sorensen L, Foldspang A, Gulmann NC, Munk-Jorgensen P. Assessment of dementia in nursing home residents by nurses and assistants: criteria validity and determinants. Int J Geriatr Psychiatry 2001; 16: 615-21.

19. Craig D, Passmore AP, Fullerton KJ, et al. Factors influencing prescription of CNS medications in different elderly populations. Pharmacoepidemiol Drug Saf 2003; 12: 383-7.

20. Lindesay J, Matthews R, Jagger C. Factors associated with antipsychotic drug use in residential care: changes between 1990 and 1997. Int J Geriatr Psychiatry 2003; 18: 511-9.

21. Percudani M, Barbui C, Fortino I, et al. Epidemiology of first- and second-generation antipsychotic agents in Lombardy, Italy. Pharmacopsychiatry 2005; 38: 128-31.

22. Alonso J, Angermeyer MC, Bernert S, et al. Psychotropic drug utilization in Europe: results from the European study of the epidemiology of mental disorders (ESEMeD) project. Acta Psychiatr Scand Suppl. 2004; 420: 55-64.

23. Trifiro G, Spina E, Brignoli O, et al. Antipsychotic prescribing pattern among Italian general practitioners: a population-based study during the years 1999-2002. Eur J Clin Pharmacol 2005; 61: 47-53.

24. Carpenter I, Gambassi G, Topinkova E, et al. Community care in Europe. The Aged in Home Care Project (AdHOC). Aging Clin Exp Res 2004; 16: 259-69.

25. Morris JN, Fries BE, Steel K, et al. Comprehensive clinical assessment in community settings: applicability of the MDS-HC. J Am Geriatr Soc 1997; 45: 1017-24.

26. Morris JN, Fries BE, Bernabei R, et al. RAI-Home Care Assessment Manual for Version 2.0. Marblehead, MA: Opus Communications, 2000.

27. Landi F, Tua E, Onder G, et al. Minimum Data Set for home care: A valid instrument to assess frail older people living in the community. Med Care 2000; 38: 1184-90.

28. Burrows AB, Morris JN, Simon SE, Hirdes JP, Phillips C. Development of a Minimum Data Set-based depression rating scale for use in nursing homes. Age Ageing 2000; 29: 165-72.

29. Morris JN, Fries BE, Mehr DR, et al. MDS Cognitive Performance Scale. J Gerontol 1994; 49: M174-82.

30. Hosia-Randell H, Pitkälä K. Use of psychotropic drugs in elderly nursing home residents with and without dementia in Helsinki, Finland. Drugs Aging 2005; 22: 793-800.

31. Hughes CM, Lapane KL, Mor V, et al. The impact of legislation on psychotropic drug use in nursing homes: a cross-national perspective. J Am Geriatr Soc 2000; 48: 931-7.

32. Johnson J, Horwath E, Weissman MM. The validity of major depression with psychotic features based on a community study. Arch Gen Psychiatry 1991; 48: 1075-81.

33. Ohayon MM, Schatzberg AF. Prevalence of depressive episodes with psychotic features in the general population. Am J Psychiatry 2002; 159: 1855-61.

34. Jeste DV, Rockwell E, Harris MJ, Lohr JB, Lacro J. Conventional vs newer antipsychotics in elderly patients. Am J Geriatr Psychiatry 1999; 7: 70-6.

35. Briesacher BA, Limcangco R, Simoni-Wastila L, et al. The quality of antipsychotic drug precribing in nursing homes. Arch Intern Med 2005; 165: 1280-85.

36. Hagen B, Armstrong Ester C, Ikuta R, Williams RJ, Le Navenec C-L, Aho M. Antipsychotic drug use in Canadian long-term care facilities: prevalence, and patterns following resident relocation. Int Psychogeriatr 2005; 17: 179-93.