Prevalence of psychotropic medication use and associated factors in the elderly

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ABSTRACT – *Background and Objectives:* The object of our study was to estimate the prevalence of psychotropic drug use among non-institutionalised elderly people 65 years or older and identify possible conditioning factors.

Methods: A cross-sectional, observational study was carried out of 1161 subjects aged 65 years and older. Participants were randomly selected from health care registry listings. The main outcomes of interest were based on self-reporting and included consumption of psychotropic and other drugs (filed by the ATC Classification System), mood (based on the GDS-VE), cognitive status (Pfeiffer Questionnaire), physical-functional assessment based on Katz score, health problems (ICPC-2 classification WONCA) and socio-demographic variables.

Results: The prevalence of self-reported psychotropic drug consumption was 20.5% (95% CI: 18.2 to 22.8). Anxiolytics and hypnotics were consumed by 16.6% of the elderly, antidepressants by 7.0% and antipsychotics by only 2.1%. In multivariate logistical analyses, the use of psychotropics was independently associated with other drug consumption (non-psychotropics), (OR: 4.0, 95% CI: 1.7 to 9.5), presence of established depression (OR: 3.2, 95% CI: 1.3 to 7.6), presence of 4 or more comorbidities (OR: 2.7, 95% CI: 1.9 to 3.8), being female (OR: 2.1, 95% CI: 1.5 to 3.0) and being dependent for basic activities of daily living (OR: 1.7, 95% CI: 1.0 to 2.6).

Conclusions: The prevalence of psychotropic drug use among the elderly from Albacete is high. Several factors were identified as potential determinants of psychotropic drug use. It will be important to evaluate the misuse of these drugs in order to inform effective, efficient and safe prescription strategies.

Introduction

In Spain, the elderly account for 70% of pharmaceutical spending even though they represent slightly less than one-fourth of the population[1]. In this context, over the last 20 years there has been an important increase in the psychotropic drugs prescribed to adults, and particularly the elderly. The prevalence of psychotropic drugs use in community-dwelling elderly (generally defined as people 65 years or older) varies from 10% to 40%[2-7]. This variability is determined, among other factors, by methodological differences in the studies, whether data are obtained from surveys, population studies or from people attended in Primary Care centers.

The importance of the use of medications in general and psychotropic drugs in particular among the elderly is associated with the consequences. Aging increases the probability of drug build-up and intoxication which means that the elderly are particularly vulnerable to the effects of these drugs. These effects include cognitive impairment, sedation, confusional syndrome, falls and increased risk of fractures, which are frequent reasons for hospitalization[6,8-10].

While mental health problems are likely a factor in the use of these drugs, they may not be the only factor or even the decisive one, which means that there are other predisposing factors that must also be considered[3,6]. Some of the specific factors involved, although they have not been sufficiently analysed, include: physiological alterations of sleep patterns, demographic and socio-economic factors, the functional situation of the elderly person, the presence and simultaneity of chronic diseases, anxiety and depression as well as other factors associated with the prescribers, all of which appear to have converted the elderly into a risk group for the misuse of these drugs[2,6]. In a study based on the National Health Survey on Spanish population non-institutionalized, the authors observed a higher consumption of psychotropic drugs in women over 65 years (26.4%) than in men (10.6%)[11]. Another study carried out in US community population with a similar methodology, identified as predictors of the use of psychotropic medication, in addition to the gender, race, regional differences and the educational level[3]. The limitations in the functional abilities of non-institutionalized elderly have been linked to the use of sedatives, hypnotics and antianxiety drugs. It has also been associated dependency for mobility and the difficulties to perform instrumental activities with the use of antipsychotics[12-14]. The characteristics of prescribers such as medical specialty, number of years of practice, number of visits and type of consultations, or the number of prescribers also seem to influence the inappropriate use of these drugs[1,15-17].

If we want to minimise the problems caused by the misuse of these kinds of drugs and improve the quality of care provided to the elderly, it is essential to have a real understanding of how these drugs are used among the elderly population. In this regard, the goal of our study was to estimate the prevalence of psychotropic drug use in non-institutionalised persons aged 65 or older and to evaluate, in relation to the use of such drugs, the possible conditioning factors in terms of morbidity, physical function, emotional and cognitive status and socio-demographic characteristics.

Methods

Study design

This is a community-level transversal observational study conducted in the city of Albacete (south-eastern Spain) that has 8 basic health zones and a total population of 165,664.

Participants

The sample was selected from a list of people aged 65 or older residing in the city of Albacete, whose information was on file in the Castilla-La Mancha Health Service database. We use a simple random sampling, to ensure that all the subjects would have the same probability to be part of the sample.

The sample size was 1,387 subjects which correspond to an expected proportion of elderly consumers of psychotropics of 25%, a level of confidence of 95% and a precision rate of ± 2.4%, which was increased by 15% as a means of offsetting the anticipated lack of responses. Subjects who were institutionalised, unable to travel to the interview site or unable to take part in the interview (severe cognitive impairment, sensorial deficit or altered mental state) were excluded.

The information was gathered on a questionnaire designed for the study that was administered in the form of a semi-structured interview in person conducted by previously trained primary care nurses.

Ethical Questions

The study was approved by the Albacete Area's Clinical Research Ethics Committee. The following ethical principles were respected: consent to participate in the study once informed of the purpose and use of the data provided by the participants restricted to the proposed investigation.

Variable Studies. Measurements

The main study variable was the use of psychotropic drugs. Their prevalence among people aged 65 and older was calculated as a percentage of the participants that referred to the use of the psychotropics included in the groups of the Anatomical Therapeutic Chemical Classification System. More specifically, the active ingredients included in the following pharmacological subgroups were defined as psychotropics: antipsychotics (N05A), anxiolytics (N05B), hypnotic-sedatives (N05C), antidepressants (N06A) and psycholeptics and psychoanaleptics in combination (N06C). To correct gaps, limitations and errors in the drug consumption information provided by the subjects, they were asked to show the bottles of the medicines they consumed on a regular basis at the time of the interview.

Other variables that can be factors associated with drug use were also evaluated: sociodemographics (age, gender, marital status, education status, social class); use of other drugs (according to *The Anatomical Therapeutic Chemical Classification System*); polymedication (5 or more medications); chronic morbidity, arranged according to the International Classification of Primary Care (ICPC-2) of the World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family; emotional status, measured using the Spanish version of the Yesavage abbreviated Geriatric Depression Scale[18]; cognitive condition, evaluated using the abbreviated Pfeiffer Questionnaire[19]; physical-functional status determined using the Katz Index of Independence in Activities of Daily Living[20]. In all cases, the evaluation instruments were used with versions validated in our environment.

Statistical Analysis

The data were analysed using the SPSS 15.0 statistical program for Windows. First, a descriptive analysis was performed using ratios, measures of central tendency and dispersion measures. The response rate and the

prevalence of each of the parameters studied together were calculated, along with the corresponding confidence interval of 95%.

The techniques used to compare observed proportions between two qualitative variables were the chi-square test with Yates correction when necessary, and Fisher's exact test. In the case of a binary variable and one with more than two ordered categories, the Mantel-Haenszel linear trend test was applied. Others like the Student T test or the Mann-Whitney U test were used to measure explanatory variables on the quantitative scale. Analysis of Variance and the "H" Kruskal Wallis test were used to compare means in more than two independent groups. The association between variables was considered significant when p < 0.05.

Finally, multivariate analysis (logistic regression) was used to verify the association of the use of psychotropic medication, and in each subgroup, with their conditioning factors, performing a statistical adjustment and checking for confounding factors and interaction variables. The predictor variables were included with p values < 0.05 and were excluded when p > 0.10. Being a cross-sectional study, the estimated coefficients were interpreted as prevalence odds ratios.

Results

Of 1387 elderly people selected, a total of 1161 subjects were ultimately enrolled in the study, which corresponds to a response rate of 83.7%. The average age of respondents was 73.4 years ± 5.9 SD and a higher proportion of women (55.9%) was observed. Table 1 shows the characteristics of the study participants.

Prevalence of referred use of psychotropics

The prevalence of self-reported psychotropic drug consumption (anxiolytics, hypnotics, antidepressants and/or antipsychotics) was 20.5% (95% CI: 18.2 to 22.8). Anxiolytics and hypnotics were the most consumed drug subgroups (16.6% of the elderly), primarily benzodiazepines. Antidepressants were consumed by 7.0%, primarily in the form of SSRIs. Antipsychotics were the least used psychotropics (only 2.1% of the study participants). Moreover, the proportion of therapeutic subgroups of psychotropics consumed by the elderly compared to all drugs used and all psychotropics is shown on Table 2.

Factors associated with the use of psychotropic drugs

The consumption of psychotropic drugs by the elderly subjects in our study was significantly higher in women, widows and divorcees, subjects with established depression, cognitive deterioration and dependence for some basic activities of daily living as observed on Table 3.

The average number of health problems was significantly higher in the elderly who reported consuming psychoactive drugs (2.69 ± 2.08 DE versus 1.69 ± 1.68 DE health problems in nonusers) (p <0.001). In addition, we observed a statistically significant linear trend among this number and proportion of subjects who were consumers (p <0.001) (Figure 1).

Multivariate Analysis

A logistic regression model was constructed to determine the variables related to the consumption of psychotropic drugs, the de-

Table 1
Characteristics of the study sample (N = 1,161)

Characteristics	N	%
Age (years)		
65-74	754	64.9
75-96	407	35.1
Gender		
Male	512	44.1
Female	649	55.9
Marital status		
Married	896	77.2
Single, widowed, divorced	265	22.8
Education		
Illiterate or only read and write	786	67.8
Primary education	251	21.6
Middle and higher education	123	10.6
Cognitive status		
Cognitive impairment	93	8.0
Normal	1066	92.0
Functional physical status		
Dependent on others for daily life activities	117	10.1
Independent to carry out daily life activities	1044	89.9
Emotional status		
Symptoms of depression	96	8.3
No symptoms of depression	1064	91.7
Morbidity		
No chronic illnesses	325	28.0
One or more chronic illness	836	72.0
Medication		
No medication	114	9.8
One or more drugs	1047	90.2

Table 2
Breakdown of psychotropics consumed by the elderly as a percentage of all drugs used

Psychotropics	N (% of total drugs)	N (% of total psychotropics)
Anxiolytics/hypnotics	*210 (5.06)*	*210 (65.02)*
Benzodiazepine derivatives	190 (4.58)	190 (58.83)
Drugs related to benzodiazepine	19 (0.48)	19 (5.88)
Chlormethiazole	1 (0.02)	1 (0.31)
Antidepressants	*85 (2.04)*	*85 (26.31)*
NSMRI*	14 (0.33)	14 (4.33)
SSRIS**	55 (1.32)	55 (17.03)
Other antidepressants	16 (0.39)	16 (4.95)
Antipsychotics	*28 (0.67)*	*28 (8.67)*
Classic antipsychotics	21 (0.05)	21 (6.50)
Atypical antipsychotics	5 (0.12)	5 (1.55)
Lithium	2 (0.05)	2 (0.62)

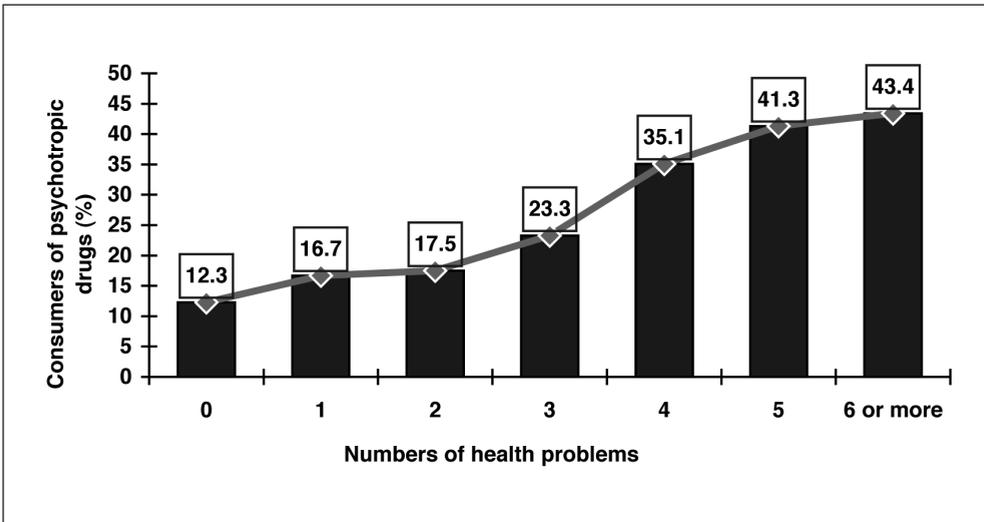* Non-selective monoamine reuptake inhibitors; **Selective serotonin reuptake inhibitors.

Figure 1. Proportion of consumers of psychotropic drugs by number of health problems.

Table 3
Proportion of consumers of psychoactive drugs as evaluated variables

Variables	Consumption of psychotropic medications		
	No (%)	Yes (%)	P value
Age (years)			
<85	80	20	0.038
≥85	67.4	32.6	
Gender			
Male	86.7	13.3	<0.001
Female	73.8	26.2	
Marital status			
Married	81.3	18.8	
Single	79.6	20.4	0.011
Widowed	73	27	
Divorced	54.5	45.5	
Social class*			
I	60	40	
II	69.7	30.3	
III	79.7	20.3	
IV	81	19	0.044
V	79.3	20.7	
VI	61.1	38.9	
Cognitive status			
Normal	80.5	19.5	<0.004
Cognitive impairment	67.7	32.3	
Functional physical status			
Independent to carry out daily life activities	81.1	18.9	<0.001
Dependent on others for daily life activities	65	35	
Emotional status			
No symptoms of depression	80.3	19.7	<0.001
Symptoms of depression	44	56	

* According to National Classification of Occupations (I: Executives and government officials. Independent professionals. Technical specialists. II: Managers and owner-managers of businesses and personal services. Other technical specialists (not senior), III: Middle managers. Administrative and civil servants in general, IV: Skilled and semi-skilled labour, V: Unskilled labour, VI: Other).

pendent variable being the consumption of psychotropic drugs.

We noted that the variables associated independently as the most important predictors were consumption of other non-psychotropic drugs and established depression. Having four or more health problems, being a woman and/or being dependent for basic activities of daily living also appear to be related to the use of psychotropic drugs, but to a lesser extent (Table 4).

Discussion

Prevalence of psychotropic drug use in non-institutionalised elderly

The prevalence of psychotropic drug consumption by the elderly participants in our study was 20.5%. This result is consistent with findings from studies published in our area. In the Spanish National Health Survey, the prevalence of psychotropic drug consumption (anxiolytics, hypnotics and antide-

Table 4
Variables associated with psychotropic drug use by logistic regression[a]

Variables	Wald	P	OR	95%IC
Consumption of other, non-psychotropic drugs	10.64	0.01	4.08	1.75 – 9.52
Emotional state: established depression	7.13	0.008	3.24	1.36 – 7.68
Health problems: 4 or more	32.39	<0.001	2.75	1.94 – 3.89
Gender: female	21.37	<0.001	2.16	1.56 – 3.00
Dependency for basic daily activities	5.47	0.019	1.71	1.092 – 2.69

[a] Variables initially included in the model. Age: less/more than 75 years; sex: male / female; marital status: married; living alone; belong to the category social V or VI; level of education, illiterate/only read and write; consumption of other non-psychotropic drugs; established depression; cognitive impairment; dependency for basic daily activities; health problems, have 4 or more.

pressants) in people over the age of 65 residing in the community was 4.6% in 1993 and ten years later, in 2003, it was 20.5%, identical to the results of our study[11]. Likewise, the ESEMeD study (a Europe-wide study conducted by home interview) points to a consumption rate of psychotropic drugs by this age group in our country of 25.9%[21].

International research of non-institutionalised elderly populations published in the last decade show a clear trend toward high consumption rates that are higher than those obtained in our study. Consumption rates were 35%, 37% and 38%, respectively, among

subjects in New Zealand[22], France[23] and Finland[24,25], although in this case the subjects were over the age of 75. The variability in the prevalence of psychotropic drug use reflected in the studies may be due to significant methodological differences[3,26,27].

The use of psychotropic drugs reported by non-institutionalised elderly refers primarily to anxiolytics and hypnotics, followed by antidepressants and, to a much lesser extent, antipsychotics[7,25,28-30]. However, the prevalence of anxiety disorders among the elderly is relatively low[31], which suggests that excessive use may also be due to inappropriate use[2,30,32].

Factors associated with psychotropic drug use

In our study, taking other medication was an independent variable associated with the overall use of psychotropic drugs. It is known that the use of psychotropics in the elderly, especially benzodiazepines, has been associated with the presence of psychological alterations, but also with comorbidity, negative perception of health condition, complaints and symptoms without clearly defined diagnoses and more frequent doctor visits, all leading to increased drug use[24,33,34].

The mood (established depression) resulted in our study, as it was predictable, a variable associated independently to the use of psychoactive drugs (OR 3.24, 95% CI: 1.36 to 7.68), especially antidepressants (OR 5.69, 95% CI: 2.28 to 14.18) but also to the consumption of anxiolytic and hypnotic drugs (OR 2.53; 96% CI: 1.07 to 5.95). Therefore, we observe a significant use of benzodiazepines in subjects with established depression, as other authors have pointed out. Several studies have highlighted the frequent use of benzodiazepines in these patients[12,23,30,35], which may raise doubts about the proper use of anxiolytics and the need to tackle depression in the elderly population. However, depression in older people often manifests in atypical ways, with symptoms of anxiety and insomnia that may explain the tendency of internists and family physicians to start the elderly patient on benzodiazepines.

Our results show higher consumption rates of psychotropic drugs associated with an increased number of health problems in the elderly. Some authors suggest that comorbidity is a stressful event in the elderly that can affect mental health and create a perceived need on the part of the patient or the clinician for the use of psychotropics[36].

Our data show a significant relationship between the consumption of psychotropic drugs and female sex. Although there are several hypotheses about possible causes of this relationship, we have not found studies that allow us to explain it consistently. Some research have suggested that women present higher prevalence of mental disorders or they are more prone to reveal their emotional problems to their doctor, to request prescriptions explicitly or to hold more positive views of psychotropic drugs[3,6,37-39]. Also, women visit physicians more often, increasing their chance of receiving a prescription[39] and physicians might be more willing to prescribe a psychotropic drug to a woman rather than to a man (prescription bias described in the literature)[3,38,39]. It is possible that, when these differences in health status between older men and women are not controlled, the relationship between gender and use of psychoactive drugs is more likely obtained[40,41]. However, other studies, such as ours, adjusting for the presence of chronic comorbidity, functional physical, mental or cognitive status and other factors such as medical visits, still detect an independent association of the female gender with the consumption of psychotropic drugs[39,42,43]. This relationship persists when the statistical adjustment also includes the mental health status[44]."

Reliance on others to perform basic activities of daily living was associated with the overall use of psychotropic drugs. Although this relationship is independent, it may be influenced by other factors such as physical and mental comorbidity and poor self-perception of health[3,6,23,45].

The results of our study refer to the non-institutionalised elderly population. People aged 65 or older who live in nursing homes are the minority but their physical and mental deterioration is much more exacerbated than that of the elderly who live in the com-

munity. If the institutionalised population were considered, the results of the prevalence of drug use, especially psychotropics, would be higher all around.

In conclusion, our findings show a high prevalence of psychotropic drug use in the elderly population residing in the community, particularly if we consider the vulnerability of this population group to the significant adverse effects of these drugs. Different factors appear to be associated with a greater or lesser prevalence of this excessive and probably inadequate drug use among the non-institutionalised elderly population. In this sense, we need a better understanding of the determining factors for the use of these drugs and evaluate effective and efficient strategies to enhance the safety of this population.

Competing interests

The authors declare no conflict of interest.

Name of sponsor

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