

Disparities by Socioeconomic Status and Diagnosis of Dementia in the Prescribing of Antipsychotics in a Real-World Data Population Over 60 Years of Age

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Abstract.

Background: Antipsychotics are widely used in the elderly due to the high prevalence of neuropsychiatric associated with dementia.

Objective: To analyze potential disparities in antipsychotic use in the general population of Gipuzkoa by socioeconomic status (SES) and diagnosis of Alzheimer's disease and related dementia (ADRD) adjusting for somatic and psychiatric comorbidities, age, and sex.

Methods: A retrospective observational study was carried out in all the 221,777 individuals over 60 years of age (Gipuzkoa, Spain) to collect diagnosis of ADRD, the Charlson Comorbidity Index, and psychiatric comorbidities considering all primary, outpatient, emergency and inpatient care episodes and first- and second-generation antipsychotics, and sociodemographic variables, namely, age, sex, SES and living in a nursing home. Logistic regression was used for multivariate statistical analysis.

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Results: Use of any antipsychotic was greater in women, individuals over 80 years old, living in a nursing home, with a diagnosis of dementia, somatic and psychiatric comorbidities, and low SES. Quetiapine was the most used drug. The likelihood of any antipsychotic use was significantly associated with low SES (odds ratio [OR]: 1.60; confidence interval [CI]: 1.52–1.68), age over 80 years (OR: 1.56; CI: 1.47–1.65), institutionalization (OR: 12.61; CI: 11.64–13.65), diagnosis of dementia (OR: 10.18; CI: 9.55–10.85) and the comorbidities of depression (OR: 3.79; CI: 3.58–4.01) and psychosis (OR: 4.96; CI: 4.64–5.30).

Conclusions: The greater levels of antipsychotic use and institutionalization in people of low SES indicate inequity in the management of neuropsychiatric symptoms. Increasing the offer of non-pharmacological treatments in the health system might help reduce inequity.

Keywords: Alzheimer's disease, antipsychotics agents, comorbidity, dementia, disparities, nursing home, quetiapine fumarate, social class

INTRODUCTION

Dementia is a highly prevalent progressive disease whose expression in the cognitive, behavioral and functional dimensions changes over time [1]. Among them, it is the behavioral one measured in terms of attention to neuropsychiatric symptoms (NPS) and disruptive behaviors that carries the greatest burden on caregivers that determines the prescribing of antipsychotics [2]. Despite their notable adverse effects, they are widely used in the elderly in general and especially in patients with dementia due to the high prevalence of NPS [3]. Non-pharmacological treatments classified as sensory stimulation interventions, cognitive/emotion-oriented interventions, behavior management techniques, and other therapies are recommended as the first option in reducing NPS [4]. Antipsychotics are indicated when non-pharmacologic options have failed or patient behavior means substantial harm to self or others [5]. Concern about their inappropriate use has led to government reports warning about their risks and recommending a reduction in their use for behavioral and psychological symptoms of dementia [6]. Although dementia with agitation and other NPS is the main indication, experts point out that they are also indicated in other diagnoses such as schizophrenia in later life, non-psychotic agitated major depression, and severe mania [7, 8]. On the contrary, their use is not recommended for panic disorders, generalized anxiety disorder, or irritability, hostility, and sleep disorders in the absence of a major psychiatric syndrome [8]. The same experts also note that no guideline can address the complexities of an individual patient and that clinical experience should be used when applying these recommendations [8]. Although there have been calls for deprescribing antipsychotics in elderly patients with dementia [6], the reality is that they are being used in as many as half of over-70-year-olds

in some settings [9]. A real-world data (RWD) study in the American population found that only a quarter of patients on antipsychotics had been diagnosed with one of the four indications approved by the U.S. Food and Drug Administration [10]. While the registration of the diagnosis of dementia in databases derived from electronic medical records reaches high levels of quality and consistency in different countries, the limited coding of NPS makes it difficult to analyze the use of antipsychotics in RWD [11, 12].

The social determinants of health are the set of conditions in which people conduct their daily lives and that shape their life trajectory [13]. Various studies have been carried out to explore potential socioeconomic or ethnic disparities in antipsychotic treatment and their results indicate significant differences in access and the type of antipsychotic used [7, 14, 15]. Disparities by socioeconomic status (SES) have also been noted in the use of antidepressants and the presence of mental disorders in general [16, 17], and the Swedish RWD study found a gradient with educational level in the use of antipsychotics both in the general population and in people with dementia [7]. According to the literature, higher levels of use are not related to an equivalent gradient in the prevalence of SNP [18]. Indicators of socioeconomic differences may be based on level of income or education, but for a comprehensive analysis of disparities in the indication of antipsychotics, we should take into account more variables such as sex, age, and somatic and psychiatric comorbidities [19]. To our knowledge, however, no study has examined the use of antipsychotics in the elderly population as a function of the diagnosis of dementia, sex, socioeconomic determinants and comorbidities [8]. Understanding the mediating effects of such covariates would allow us to identify why people with NPS and low income are prescribed more antipsychotics. Following Banerjee's analysis, our hypothesis is that this pattern of

prescribing is due to antipsychotics being used as a first-line response to behavioral disorders while families with higher income may initially consider other approaches [6].

The objective of this study was to analyze potential disparities in the use of antipsychotic medication in the general population of Gipuzkoa by SES and diagnosis of dementia adjusting for somatic and psychiatric comorbidities, age, and sex.

METHODS

A retrospective cross-sectional study was conducted to analyze the use of antipsychotic medication in the entire population over 60 years of age in Gipuzkoa, Spain. The study protocol was approved on May 12, 2021, by the Clinical Research Ethics Committee of the Basque Country (number PI2021085). No intervention was carried out on human subjects or animals as the study design was observational based on electronic health records. The study used the population registry stored in the database of the Basque Health Service, Oracle Analytics Server (OAS). This contains anonymized administrative and clinical records from January 1, 2003, to the present, and the coding of dementia diagnoses has been validated [11]. A limitation of the OAS is that it does not contain data from private practice records. Although access to our Beveridge model health system is universal for all residents, 20% of the population of Gipuzkoa has dual coverage, public provision and complementary private insurance, although the latter does not reimburse pharmacy prescriptions. As a consequence, individuals with dual coverage make use of both healthcare delivery systems when they become older, at least to obtain medications.

The study population included all people alive who, as of December 31, 2022, were over 60 years old and registered with the Basque Health Service. Within this population, in all individuals, we identified from January 1, 2003, to the present the following: the diagnosis of dementia, any conditions included in the Charlson Comorbidity Index (CCI) [20], and psychiatric comorbidities considering all primary, outpatient, emergency, and inpatient care episodes. For this, we used both the International Classification of Diseases 9th Revision Clinical Modification and 10th Revision (ICD-9-CM and ICD-10-CM, respectively) codes, since the latter have been in use since 2016. The sociodemographic variables

included were age, sex, SES, and living in a nursing home. The 19 conditions included in the CCI are acute myocardial infarction, congestive heart failure, peripheral vascular disease, stroke, lung disease, connective tissue disorder, peptic ulcer, liver disease, diabetes, complications of diabetes, paraplegia, kidney disease, cancer, metastatic cancer, severe liver disease, HIV, and dementia [21]. As shown in Supplementary Table 1, psychiatric comorbidities were classified into three clusters: depression, psychosis and personality disorders, and other mental disorders. The use of antipsychotic medication and the type used were based on the Anatomical, Therapeutic, Chemical (ATC) classification system (ATC group N05A) [22]. All individuals who were prescribed from January 1, 2003, to the present one or more antipsychotic drugs identified by their ATC code were considered antipsychotic drug users. We did not distinguish between regular or as-needed use or between different doses of antipsychotic drug. ATC codes N05AE04, N05AH02, N05AH03, N05AH04, N05AX08, and N05AX12 were considered atypical or second-generation antipsychotics, and all other antipsychotics were classified as first-generation antipsychotics [22].

Information on SES was obtained based on the drug copayment categories that are established according to income level. The high and low SES groups included people with household incomes greater than or equal to 18,000 euros and lower than 18,000 euros respectively [23].

Statistical analysis

In the initial step, a descriptive analysis was carried out to compare the characteristics of the population by sex and SES and as a function of whether they had been diagnosed with dementia or had been prescribed antipsychotics. Differences in categorical variables were assessed using the chi-square test, and means of normally distributed continuous variables were compared using Analysis of Variance (ANOVA).

Multivariable analyses using logistic regression models were performed to estimate the likelihood of antipsychotic use in three populations: the total population over 60 years of age (221,803 individuals), the population with dementia (8,549 individuals), and the population without dementia (213,254 individuals). For each of the three populations, three dependent variables were analyzed adjusted for age, sex, socioeconomic level, somatic comorbidity and psychiatric comorbidity: use of any antipsychotic drug, and

Table 1
Characteristics of the population over 60 years of age by socioeconomic status

	Total	Low SES		High SES		P
	221,803	120,167	54.2%	101,636	45.8%	
Female	122,132	74,855	62.3%	47,277	46.5%	<0.001
Male	99,671	45,312	37.7%	54,359	53.5%	
Age group						<0.001
60–69 y	93,017	43,106	35.9%	49,911	49.1%	
70–79 y	75,445	39,586	32.9%	35,859	35.3%	
≥ 80 y	53,341	37,475	31.2%	15,866	15.6%	
Dementia	8,549	5,858	4.9%	2,691	2.6%	<0.001
Antipsychotic user	10,963	8,000	6.7%	2,963	2.9%	<0.001
Living in a nursing home	4,383	3,692	3.1%	691	0.7%	<0.001
Living in the community	217,394	116,475	96.9%	100,919	99.3%	
CCI score						<0.001
0–1	200,092	107,051	89.1%	93,041	91.5%	
> 1	21,711	13,116	10.9%	8,595	8.5%	
Psychiatric comorbidity						
No mental disorder	124,244	64,677	53.8%	59,567	58.6%	<0.001
Depression	24,201	15,471	12.9%	8,730	8.6%	<0.001
Psychosis	10,765	6,485	5.4%	4,280	4.2%	<0.001
Other	85,996	48,368	40.3%	37,628	37.0%	<0.001
Age continuous (y)	Total		Male		Female	P
Mean (SD)	72.5 (9.0)		74.1 (9.5)		70.5 (7.9)	<0.001

CCI, Charlson comorbidity index; SES, socioeconomic status.

Table 2
Characteristics of the population over 60 years of age by sex

	Total	Male	Female	P		
	221,803	99,671	44.9%	122,132	55.1%	
Age group						<0.001
60–69 y	93,017	45,723	45.9%	47,294	38.7%	
70–79 y	75,445	34,645	34.8%	40,800	33.4%	
≥ 80 y	53,341	19,303	19.4%	34,038	27.9%	
Dementia	8,549	2,714	2.7%	5,835	4.8%	<0.001
Antipsychotic user	10,963	3,986	4.0%	6,977	5.7%	<0.001
Living in a nursing home	4,383	1,304	1.3%	3,079	2.5%	<0.001
Living in the community	217,394	98,367	98.7%	119,027	97.5%	
CCI score						<0.001
0–1	200,092	88,801	89.1%	111,291	91.1%	
> 1	21,711	10,870	10.9%	10,841	8.9%	
SES						
High	101,636	54,385	54.6%	47,251	38.7%	<0.001
Low	120,167	45,312	45.5%	74,855	61.3%	
Psychiatric comorbidity						
No mental disorder	124,244	61,770	62.0%	62,474	51.2%	<0.001
Depression	24,201	6,478	6.5%	17,723	14.5%	<0.001
Psychosis	10,765	6,967	7.0%	3,798	3.1%	<0.001
Other	85,996	32,592	32.7%	53,404	43.7%	<0.001
Age continuous (y)	Total	Male		Female	p	
Mean (SD)	72.5 (9.0)	71.4 (8.4)		73.4 (9.4)		<0.001

CCI, Charlson comorbidity index; SES, socioeconomic status.

separately, use of first- or second-generation antipsychotics.

RESULTS

The study population, namely, all over-60-olds registered with the health service in Gipuzkoa, com-

prised 221,803 individuals. Their characteristics by sex and SES are shown in Tables 1 and 2 and by diagnosis of dementia and use of any antipsychotic in Table 3. Rates of use of any antipsychotic were higher in women, and people over 80 years old, living in a nursing home, with a diagnosis of dementia, somatic and psychiatric comorbidities, and low SES. The profile of people using any antipsychotic was

Table 3
 Characteristics of the population over 60 years of age by diagnosis of dementia and antipsychotic use

	Total	Diagnosed dementia		Total	Use of any antipsychotic	
	221,803	8,549	3.9%	221,803	221,803	4.9%
Female	122,132	5,835	4.8%	122,132	122,132	5.7%
Male	99,671	2,714	2.7%	99,671	99,671	4.0%
Age group						
60–69 y	93,017	441	0.5%	93,017	93,017	3.0%
70–79 y	75,445	2,136	2.8%	75,445	75,445	3.6%
≥ 80 y	53,341	5,972	11.2%	53,341	53,341	10.3%
Dementia	8,549			8,549	8,549	39.8%
Antipsychotic user	10,963	3,402	31.0%	10,963		
Living in a nursing home	4,383	1,585	36.2%	4,383	4,383	55.5%
Living in the community	217,420	6,964	3.2%	217,420	217,420	3.9%
CCI score						
0–1	200,092	5,809	2.9%	200,092	200,092	4.5%
> 1	21,711	2,740	12.6%	21,711	21,711	8.8%
SES						
High	101,636	2,649	2.6%	101,636	101,636	2.9%
Low	120,167	5,858	4.9%	120,167	120,167	6.7%
Psychiatric comorbidity						
No mental disorder	124,244	3,733	3.0%	124,244	124,244	2.1%
Depression	24,201	2,007	8.3%	24,201	24,201	18.3%
Psychosis	10,765	926	8.6%	10,765	10,765	25.1%
Other	85,996	3,794	4.4%	85,996	85,996	6.9%
Age continuous (y)	Total	Diagnosed dementia		Total	Use of any antipsychotic	
Mean (SD)	72.5 (9.0)	82.6 (7.4)		72.5 (9.0)	75.0 (9.5)	

CCI, Charlson comorbidity index; SES, socioeconomic status. All the differences were statistically significant with $p < 0.001$.

Table 4
 Treatments disaggregated by dementia status in 2022

	No dementia		Dementia		Total	
	213,228		8,549		221,777	
Any antipsychotic treatment	7,561	3.5%	3,402	39.8%	10,963	4.9%
Any first-generation antipsychotic	2,275	1.1%	1,052	12.3%	3,327	1.5%
Any second-generation antipsychotic	6,518	3.1%	3,160	37.0%	9,678	4.4%
First generation						
Chlorpromazine	139	0.1%	13	0.2%	152	0.1%
Levomepromazine	288	0.1%	62	0.7%	350	0.2%
Haloperidol	1,394	0.7%	977	11.4%	2,371	1.1%
Tiapride	167	0.1%	28	0.3%	195	0.1%
Second generation						
Clozapine	146	0.1%	151	1.8%	297	0.1%
Olanzapine	2,059	1.0%	246	2.9%	2,305	1.0%
Quetiapine	3,584	1.7%	2,530	29.6%	6,114	2.8%
Risperidone	1,529	0.7%	1,048	12.3%	2,577	1.2%
Aripiprazole	1,017	0.5%	142	1.7%	1,159	0.5%
Paliperidone	539	0.3%	41	0.5%	580	0.3%

similar in the populations with and without a diagnosis of dementia. Low SES individuals' population contained more women, and people over 80 years old, living in a nursing home, with a diagnosis of dementia, somatic and psychiatric comorbidities.

The type of antipsychotics most used in both dementia and non-dementia populations were second-generation antipsychotics such as quetiapine and risperidone (Table 4). Among the first-generation drugs, haloperidol was the most widely used. The ratio of second- to first-generation drug use

was around three both in the population with dementia (3,160/1,052) and that without dementia (6,518/2,275).

In the multivariable logistic regression analysis of the entire population (Table 5), the likelihood of any antipsychotic use was significantly positively associated with low SES (odds ratio [OR]: 1.60; confidence interval [CI]: 1.52–1.68), age over 80 years (OR: 1.56; CI: 1.47–1.65), institutionalization (OR: 12.61; CI: 11.64–13.65), diagnosis of dementia (OR: 10.18; CI: 9.55–10.85), and the comorbidities of depression

(OR: 3.79; CI: 3.58–4.01) and psychosis (OR: 4.96; CI: 4.64–5.30). On the contrary, age between 70 and 79 years (OR: 0.88; CI: 0.83–0.94) and CCI score greater than 1 (OR: 0.91; CI: 0.85–0.97) had significant ORs less than 1. No significant differences were observed by sex.

The separate analysis of the use of first- (Table 6) and second- (Supplementary Table 2) generation antipsychotics using logistic regression showed prescribing patterns similar to that considering any antipsychotic. Nonetheless, it should be highlighted that the OR associated with dementia in the total population models rose from 4.00 in the first-generation models to 10.78 in the second-generation models.

DISCUSSION

The main findings of this population-based study were the high rates of use of antipsychotics and the greater likelihood of receiving this type of drug among people with low SES. The analysis was adjusted for covariates that are associated with the probability of their use, such as having been diagnosed with dementia, living in a nursing home, older age, and the presence of other psychiatric comorbidities. Nonetheless, when analyzing the population with dementia separately, the SES-adjusted differences were only maintained in the case of the prescribing of first-generation antipsychotics. We understand that this reflects good practice in patients with dementia in that they are treated with second-generation instead of first-generation antipsychotics, in line with recommendations [8]. Moreover, second-generation antipsychotics are indicated if there are psychotic symptoms. In a Swedish study, the greater likelihood of antipsychotic use in the population with a low educational level also extended to people with dementia [7]. Their unadjusted figures of use were lower than in these results both in the general population (3.8% versus 4.9%) and in the population with dementia (21.0% versus 39.8%). In a Canadian study, the percentage of dementia patients with antipsychotic use was found to be 22.7% overall and higher in people with low income [24]. Percentages of use usually differ markedly depending on whether the sample is composed of individuals who are institutionalized or living in the community. The population analyzed correspond to a mixture of both populations [25]. Olfson et al. found similar figures in the population over 75 years of age with dementia (37% for 75- to 79-year-olds and 48% for 80- to 84-year-olds) [9].

Table 5
Logistic regression of overall use of antipsychotics in the general population and populations with and without dementia

Any antipsychotic Variable	Total population			Dementia population			No dementia population		
	OR	Lower CI	Upper CI	OR	Lower CI	Upper CI	OR	Lower CI	Upper CI
Age 60–69	ref			ref			ref		
Age 70–79	0.88	0.83	0.94	1.59	1.23	2.06	0.82	0.77	0.87
Age ≥ 80	1.56	1.47	1.65	2.39	1.88	3.06	1.44	1.35	1.54
CCI > 1	0.91	0.85	0.97	0.82	0.74	0.91	1.02	0.94	1.10
Gender female	0.97	0.92	1.02	1.00	0.90	1.11	0.97	0.92	1.02
Low SES	1.60	1.52	1.68	1.05	0.94	1.17	1.73	1.64	1.83
Nursing home	12.61	11.64	13.65	5.77	5.08	6.56	17.40	15.80	19.15
Dementia	10.18	9.55	10.85						
Depression	3.79	3.58	4.01	1.49	1.30	1.70	4.46	4.20	4.73
Psychosis	4.96	4.64	5.30	2.45	2.07	2.91	5.25	4.89	5.63
Other	0.90	0.84	0.96	0.97	0.82	1.15	0.85	0.79	0.92
No mental disorder	0.46	0.42	0.50	0.75	0.62	0.92	0.36	0.33	0.40

CI, confidence interval; CCI, Charlson comorbidity index; SES, socioeconomic status.

Table 6
Logistic regression of use of first-generation antipsychotics in the general population and populations with and without dementia

First-generation Variable	Total population			Dementia population			No dementia population					
	OR	Lower CI	Upper CI	P	OR	Lower CI	Upper CI	P	OR	Lower CI	Upper CI	P
Age 60–69	ref				ref				ref			
Age 70–79	0.98	0.87	1.09	<0.001	1.34	0.87	2.12	0.20	0.89	0.79	1.00	0.05
Age ≥ 80	2.11	1.90	2.33	<0.001	2.28	1.53	3.54	<0.001	1.93	1.73	2.15	<0.001
CCI > 1	1.08	0.98	1.20	0.11	1.07	0.92	1.23	0.37	1.15	1.01	1.31	0.04
Gender female	0.90	0.83	0.98	<0.05	0.94	0.81	1.11	0.47	0.89	0.81	0.97	0.012
Low SES	1.56	1.43	1.70	<0.001	1.28	1.09	1.51	<0.05	1.59	1.44	1.76	<0.001
Nursing home	8.21	7.45	9.03	<0.001	4.47	3.88	5.15	<0.001	11.55	10.23	13.03	<0.001
Dementia	4.00	3.63	4.40	<0.001								
Depression	2.56	2.33	2.81	<0.001	1.24	1.04	1.49	<0.001	3.25	2.93	3.62	<0.001
Psychosis	3.08	2.76	3.42	<0.001	1.83	1.48	2.25	<0.001	3.45	3.06	3.89	<0.001
Other	0.85	0.76	0.95	<0.01	1.02	0.82	1.27	0.85	0.79	0.70	0.89	<0.001
No mental disorder	0.57	0.50	0.66	<0.001	0.88	0.67	1.15	0.34	0.48	0.41	0.57	<0.001

CI, confidence interval; CCI, Charlson comorbidity index; SES, socioeconomic status.

Although sex and age have been analyzed in other studies as confounders, our analysis identifies a set of drivers that play a key role in the indication of antipsychotics, namely, income level, living in a nursing home, and having dementia, somatic comorbidities (CCI) and/or psychiatric comorbidities. There was a disparity by gender, women being prescribed more antipsychotics than men in the raw analysis by age group, as in other studies [9]. Nonetheless, the differences by gender were not statistically significant when all the other covariates were included in the multivariate models. The apparent inconsistency is explained by women being more likely to be older, be diagnosed with dementia and have a lower household income. That is, older age and lower SES together in women mediate the prevalence of dementia and consequently the higher rates of antipsychotic prescribing.

A high percentage of patients with dementia having been treated with antipsychotics is attributable to the presence of behavioral disorders, since antipsychotics can reduce the intensity of symptoms and improve the well-being of patients [26] and caregivers [6, 27]. This practice is very common despite antipsychotics having serious side effects and the calls for more controlled prescribing [6, 10, 27]. On the other hand, the explanation for their greater use in the low SES population is not clear. It has been suggested that this disparity is attributable to dementia in people with low SES being diagnosed later due to their difficulty in receiving adequate medical care [7, 24]. Along similar lines, the explanation for this disparity is that people with lower SES experience difficulty obtaining non-pharmacological treatment as the first line of care for behavioral disorders. Possibly, atypical antipsychotics are more often the first-line response to challenging behaviors in dementia in deprived people. They are more frequently used in delirium, when physical problems are present [8]. As low SES patients have more barriers to receiving early treatment for NPS, the risk of delirium is higher. In addition, in the Basque public health system, there is no non-pharmacological support program for families to help with community management of NPS. As families are in charge of organizing home care, a higher level of income makes it possible to obtain non-pharmacological support to reduce the distress associated with caregiving and delay the use of antipsychotics.

Experts point out that it is difficult to generalize the approach due to the complexity of the interaction between patients and their caregivers but recom-

mend always using non-pharmacological treatments as the first line [28]. The problem is the availability of such non-pharmacological treatments for people with low SES. Their incorporation into public health services would be easier if the different approaches were standardized [4, 29]. That it, despite their effectiveness [29] and cost-effectiveness [30, 31] having been recognized, the variety of proposals adds to the difficulty of obtaining evidence of their benefits. Advancing in their standardization would help to evaluate their effectiveness and cost-effectiveness and therefore their reimbursement by health systems.

A greater difficulty in receiving adequate care in the community has also been put forward as an explanation for the differences in institutionalization of people with dementia by gender and level of deprivation [15]. The likelihood of living in a nursing home was highest in women with the least deprivation (quintiles Q1-Q3) and men with the lowest socioeconomic level (quintiles Q4-Q5). Unlike those in quintiles Q4-Q5, men with dementia and more resources live in the community despite behavioral symptoms because they can access the support necessary to make this possible. By outliving their partners, rich women reach these stages of dementia as widows and have to resort to institutionalization. Living in a nursing home implies a very high likelihood of being prescribed antipsychotics. The percentage of institutionalized people prescribed some antipsychotic in this study (55.5%) was practically the same as that in the Canadian population (56%) [24]. Despite adjusting for other variables, the OR is 12.61 for the institutionalized population compared to the non-institutionalized population. Numerous reasons contribute to the institutionalization of people with dementia, but a survey of caregivers indicated that the quality of dementia care and the relationship between the informal caregiver and the person with dementia are determining factors [32, 33]. The great difference between the raw prevalence of nursing home residence in low SES (3.1%) and high SES (0.7%) is striking. Given that people generally prefer to continue living in their own home, we understand that these findings reflect an inequity in the management of problems associated with aging since level of income is decisive in being able to receive adequate care in the community [19].

The population group with the highest CCI scores, indicating more somatic comorbidities, showed a different pattern, the likelihood of receiving antipsychotics being lower in the population with dementia

(OR: 0.91; CI: 0.85–0.97) and there being no differences in the population without dementia (OR: 1.02; CI: 0.94–1.10). The CCI is a predictor of survival and given that greater comorbidity determines a shorter life expectancy, it could explain the frequency of behavioral disorders being lower because they appear in advanced stages of dementia [34]. The same reasoning has been applied to explain variability in dementia prevalence by gender, with higher levels of comorbidity and, therefore, shorter life expectancy in men [35].

Notably, quetiapine was the most widely used drug both dementia and non-dementia populations. Quetiapine is a complex medication due to its dose-dependent effects. At low doses, it is approved for the treatment of bipolar depression, and at higher doses for the treatment of manic episodes and psychotic disorders. Clinical guidelines also consider low doses of quetiapine for treating resistant depression, as a potentiation strategy. Notwithstanding its top position, its prescribing in dementia is off-label [27, 36] and, therefore, can be understood as poor practice [37] if there is no concomitant mental disorder (psychosis, bipolar disorder or resistant major depression). In the Swedish study, in 2005, this top position was occupied by risperidone, in populations both with dementia and without dementia [7]. In a sequential drug treatment algorithm for agitation and aggression in dementia, risperidone represented the first step because it had the strongest evidence for effectiveness, even though it was associated with more metabolic adverse effects than quetiapine [38]. On the other hand, the use of quetiapine in older adults can cause serious adverse effects such as increased mortality, orthostatic hypotension, hip fractures and injuries, and metabolic disorders [39], and hence, when prescribed, patients should be closely monitored. We wonder what has changed in recent years to cause quetiapine to become the leading drug for the treatment of NPS in the Basque population despite all the warnings about its use in dementia patients. Various factors may explain its success [10, 39, 40]. First, quetiapine carries a lower risk of extrapyramidal effects including tardive dyskinesia. Second, it has a better cardiovascular safety profile than risperidone or olanzapine. Third, its high affinity for histamine receptors and effect on D2-D2 dopamine receptors and 5HT2 serotonin receptors provide it with appreciable sedative properties [41]. In addition, the lack of extrapyramidal effects is accompanied by a subjective sense of well-being. In contrast, risperidone is a very incisive drug that only needs low doses to

block the dopamine D2 receptor to become effective in treating psychotic symptoms [41]. Nevertheless, it is less often chosen in the elderly because it produces many extrapyramidal effects and is not as sedative.

In general, the newer antipsychotics have fewer adverse effects and that is why they have become the pharmacological treatment of choice [7]. In our case, neither the raw nor the adjusted data showed a disparity in people with dementia due to greater use of first- than second-generation antipsychotics. Specifically, in the overall population, the likelihood of having been prescribed first-generation drugs had a lower OR (4.8) than that of the second-generation drugs (10.8), and hence, the results do not indicate discrimination against people with dementia. Similarly, in a 2005 study with general population data, the OR of the diagnosis of dementia was higher in those prescribed second-generation (9.37) than first-generation (3.69) antipsychotics [7].

The limitations of this study are related to its observational design, which limits the scope of the differences that could be explored between dementia and non-dementia populations. Another aspect to note is that the analyzed prevalence includes only diagnosed cases, leaving out people with dementia who have not had contact with the health system. Another limitation to note is the lack of two variables such as the clinical subtype of dementia and marital status in the Basque Health Service database. Although the coding of dementia using the ICD has been validated, the clinical subtypes of dementia (Alzheimer's disease, vascular dementia, dementia associated with Parkinson's disease, Lewy body disease, frontotemporal dementia, etc.) are coded in a small percentage [11]. Not having included the person's marital status in the analysis is another limitation since it would have been important to recognize situations of loneliness and their consequences in the management of NPS. Among its strengths are the population nature of the sample and the existence of previous work validating the diagnosis of dementia [11]. Further, the incidence and prevalence of dementia in databases dependent on electronic medical records have shown great consistency [3, 42–44].

The main conclusion of the study is that the greater levels of antipsychotic use and institutionalization in people of low SES indicate a lack of equity in the management of NPS. Increasing the offer of non-pharmacological treatments in the public health system might help reduce inequity in antipsychotic use.

AUTHORS CONTRIBUTIONS

Javier Mar (Conceptualization; Funding acquisition; Methodology; Project administration; Supervision; Writing – original draft); Uxue Zubiagirre (Data curation; Formal analysis; Methodology; Writing – review & editing); Igor Larrañaga (Data curation; Formal analysis; Methodology; Supervision; Writing – review & editing); Myriam Soto-Gordoa (Conceptualization; Funding acquisition; Investigation; Methodology; Software; Validation; Writing – review & editing); Lorea Mar-Barrutia (Conceptualization; Investigation; Methodology; Supervision; Validation; Writing – review & editing); Ana González-Pinto (Conceptualization; Formal analysis; Funding acquisition; Investigation; Project administration; Writing – review & editing); Oliver Ibarrondo (Conceptualization; Data curation; Formal analysis; Funding acquisition; Methodology; Project administration; Writing – review & editing).

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CONFLICT OF INTEREST

The authors have no conflict of interest to report.

DATA AVAILABILITY

The data that support the findings of this study are available from Basque Health Service but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of Basque Health Service.

SUPPLEMENTARY MATERIAL

The supplementary material is available in the electronic version of this article: <https://dx.doi.org/10.3233/JAD-240004>.

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