Farm Hosp. 2009;**33(3)**:161-71

Farmacia HOSPITALARIA

www.elsevier.es/farmhosp

ORIGINAL ARTICLE

Consumption of oral analgesics and dosage forms in elderly patients: population based study

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Received January 12, 2009; accepted March 30, 2009

KEYWORDS
Analgesics;
Dysphagia;
Nursing homes

ABSTRACT
Objective: The objective of the study was to describe the consumption of oral analgesics (OA) in people aged ≥65 years, and distinguish between easy-to-swallow (ETS) formulations and solid forms.
Methods: Real data study with a cross sectional design. Electronic anonymous medical records of one year of primary care activity (July 2007-June 2008) were retrospectively reviewed. Inclusion criteria: patients aged ≥65 years receiving OA. Subgroups: institutionalized/non institutionalized. It was considered the oral analgesics use as a principal variable. Study variables: socio-demographic, pharmaceutical formulations (solid and ETS), co morbidities, type of analgesics, geriatric scales (Minimental, Barthel), and poly-medication. Multiple logistic regression analysis models were applied. Program SPSSWIN, statistical signification $P<.05$.
Results: Overall 78% patients regularly consumed OA. A total of 11 344 patients were studied; mean age 75.1 (7) years; female 61.5%. Two percent of patients were institutionalized and were older (OR=1.2), predominantly female (OR=1.3), had more co morbidity (OR=3.5; $P<.001$) and lower geriatric scale scores. OA were 13.8 % of total drug consumption (95% CI, 13.2-14.4); NSAIDs 69.5% and opioids 17.6%. Poly-medication 90.6% (96% institutionalized vs 90.5% non institutionalized; $P=.019$). Thirty-one point one percent of patients used ETS whose use was associated with stroke (OR=2.7), neuropathy (OR=2.4; $P<.001$), and urinary incontinence. Institutionalized patients consumption of paracetamol, tramadol, and aceclofenac was higher (54.3%, 19%, and 7.6%, respectively).
Conclusions: The use of OA was high, particularly in institutionalized patients. NSAIDs use was higher than expected compared to opioids that were lower than expected. The use of ETS analgesics was lower than expected given the reduced swallowing capacity of elderly patients.

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1130-6343/$ - see front matter

PALABRAS CLAVE
Analgésicos;
Disfagia;
Residencias geriátricas

Consumo de analgésicos de formulación oral y adecuación de las formas galénicas en pacientes mayores: estudio de base poblacional

RESUMEN
Objetivo: El objetivo del estudio fue determinar el consumo de analgésicos orales (AO) según su formulación sólida y de fácil deglución (FFD) en pacientes de 65 años o más atendidos en un ámbito poblacional.
Métodos: Diseño transversal-multicéntrico realizado a partir de la revisión retrospectiva de registros médicos informatizados de pacientes atendidos en atención primaria entre julio de 2007 y junio de 2008. Criterios de inclusión: edad de 65 años o más y en tratamiento con AO. Subgrupos: pacientes institucionalizados y no institucionalizados. Se consideró el consumo de AO como variable principal. Principales medidas: sociodemográficas, AO en formulación sólida o FFD, comorbilidad, grupos terapéuticos, principios activos, escalas geriátricas (Minimental, Barthel) y polifarmacia. Análisis de regresión logística para la corrección de los modelos. Programa SPSS, con una significación estadística para $p < 0,05$.
Resultados: El consumo de AO fue del 78%. Se estudió a 11.344 pacientes; edad, 75,1 ± 7 años; mujeres, el 61,5%. Los pacientes institucionalizados fueron el 2% y se caracterizaron por: mayor edad (odds ratio [OR] = 1,2), predominio de mujeres (OR = 1,3), mayor morbilidad general (OR = 3,5) ($p < 0,001$) y menor puntuación en las escalas geriátricas. El consumo de AO fue del 13,8% (intervalo de confianza del 95%, 13,2-14,4); el de antiinflamatorios no esteroideos (AINE), del 69,5% y de opiáceos, el 17,6%, del total de envases. El 90,6% de los pacientes presentó polifarmacia (el 96% de los institucionalizados frente al 90,5% de los no institucionalizados; $p = 0,019$). El uso de FFD fue del 31,3% del total de envases; que se relacionó positivamente con la edad y ciertos estados patológicos, como accidente cerebrovascular (OR = 2,7), neuropatías (OR = 2,4; $p < 0,001$) e incontinencia urinaria. En pacientes institucionalizados el consumo de paracetamol, tramadol y aceclofenaco fue mayor (el 54,3, el 19 y el 7,6%, respectivamente).
Conclusiones: El consumo de AO es alto, sobre todo en pacientes institucionalizados. Destaca una sobreutilización de AINE e infrautilización de opiáceos. La infrautilización de FFD depende de su disponibilidad en el mercado a pesar de la elevada prevalencia de disfagia en esta población.

Introduction

Progressive ageing of the population and epidemiological changes to diseases are creating significant medical challenges.[1,2] The increasing predominance of chronic diseases and a higher rate of patients with multiple pathologies and significant fragility who use multiple medications are two tendencies that condition medical practice and lead to increased use of health resources.[3,4] Psychosocial deterioration and functional dependency are 2 sensitive factors for the geriatric population, and many in that population are institutionalised in residence centres for the elderly.[5-7]

In many cases, the pain perceived by the elderly patient, which has sensory, cognitive, and emotional components, is treated with a multidisciplinary approach, but pharmacological analgesic treatment is still its fundamental pillar.[2,9] In general, drugs with an increasing progressive effect are used, always beginning with lower doses that manage the pain, followed by combinations of drugs until opioids and other complementary techniques are needed.[9-11] As a result, the tendencies for treating the patient experiencing pain are oriented toward prescribing an appropriate analgesic for the intensity of the pain (the analgesic ladder envisioned by the WHO).[11]

Oral administration of drugs is the recommended and most widely-used procedure, provided that it is tolerated by the patient. Methods of oral administration may be classified according to drug properties at the time they are ingested: solid form, liquid form, soluble, or easy to swallow (ETS) drugs. The latter are easier for the patient to swallow, so they are the drugs of choice for children, the elderly and patients with difficulty swallowing.[2,4,12] In addition, given that they do not have to be broken down or dissolved in the digestive tract, they often begin to act more rapidly.[13] Optimising efficient pharmaceutical care and promoting steps for appropriate medication use and improving quality are goals for which all professionals involved in prescribing and dispensing drugs must strive.

Not having the appropriate pharmaceutical means for administering drugs to certain patients can lead to

manipulating medications in ways that are not always appropriate, although this is a common practice among patients and/or health care professionals. Examples include opening capsules and breaking or grinding tablets. In other cases, the difficulty of swallowing large tablets or capsules is one of the causes of failure to comply with pharmaceutical treatment, and can even lead to abandoning the medication. Oropharyngeal dysphasia affects 22% of all patients over 50 years of age.[14] In patients with neurological disorders, the rate is higher; it affects more than 30% of patients in this group, and more than 50% of those who are institutionalised and elderly.[15,16]

Given the lack of scientific evidence and the inconsistencies in the data available to us, it is of interest to learn more about the use of the pharmaceutical forms marketed in Spain and the individual needs of elderly patients. In this study, we evaluate current use patterns for oral analgesics in a group over 64 years of age in the Spanish population according to dosage form (solid/ETS) and other socio-demographic and medical variables.

Methods

General study design and study environment

The study population was made up of patients at 6 updated primary care (PC) centres (Apenins-Montigalà, Morera-Pomar, Montgat-Tiana, Nova Lloreda, La Riera, and Martí-Julià), all managed by Badalona Serveis Assistencials, which offer service to a population of about 106 500 inhabitants, 16.4% of whom are older than 64. The population in the study is mainly urban and at a lower-middle socioeconomic level. The organisation has a combined composition, with public ownership and private services (in conjunction with CatSalut) and follows a business management model. In addition, the group has personnel numbers, training policies, organisational model and a list of services that are similar to most PC centres in Catalonia, with a decentralised management model and sole integral structural services. A transversal, multi-centre study was carried out based on the retrospective review of computerised medical records (the OMIAPWIN programme) for patients examined in the context of primary care and normal clinical practice. All registered patients were included who needed attention between July 2007 and June 2008 and who met the following requirements: *a)* older than 64; *b)* both sexes; and *c)* undergoing acute, chronic, or on-demand treatment regimens with analgesic medication.

Patients who were brought to our centre or transferred to other centres during the study period were excluded. Two subgroups were identified: patients institutionalised in elderly care residences, and non-institutionalised patients (the population group).

Measuring the operational variable and morbidity

Oral dosage forms are classified as solid forms and easy-to-swallow forms (ETS); in addition to liquid or powdered forms, the latter group also includes disintegrating or effervescent tablets. Regular consumption of packaged oral analgesics during the study period was classified in 3 groups: *a)* ETS: patients with prescriptions for powdered, solution, suspension, granulated, effervescent tablet, and disintegrating tablet dosage forms; *b)* solid dosage forms: patients with prescriptions for caplet, solid pills, lozenges, and tablets; and *c)* a combination of the 2, including patients who took both dosage forms (ETS and solid). Regular use was understood as an annual consumption margin of more than 2 packages/year of pharmaceutical products in each group (ETS and solid); this criterion was established by consensus of the authors of the study. More than 3 packages/year in one of the 2 groups was classified as high consumption.

Other variables in this study are age (continuous and by interval) and sex, as well as the personal history obtained from the International Classification of PC (ICPC-2),[17] in component 7 on diseases and health problems: hypertension (K86, K87), lipid disorder (T93), diabetes mellitus (T90, all types), obesity (T82), tobacco abuse (P17), alcohol abuse (P15, P16), all types of organ failure (heart, liver, and kidney), ischaemic heart disease (K74, ischaemic heart disease with angina; K75, acute myocardial infarction; K76, coronary ischaemia), stroke (including ictus and transient ischaemia), cardiac arrhythmia (all types), chronic obstructive pulmonary disorder (R95, chronic obstructive airway disease), asthma (R96), depressive syndrome (P76), affective disorders (P71, P72, P73), dementia (all types), memory loss (P70, P20), nerve disorders: Parkinson's disease, amyotrophic lateral sclerosis (N86, N87, N88, N99), neurosensory disorders (hypoacusia and refraction errors), thyroiditis (T81, T85, T86), coagulation disorders (B83, B99), gastroduodenal reflux (D84), peptic ulcer (D85, D86), constipation (D12), fractures (L72-L76), osteoarticular diseases (L80-L99), fibromyalgia (L95), osteoporosis (L95), urinary incontinence (U04, U05), malignant neoplasias (all types), and dysphagia (D21). The summary variable for general comorbidity for each patient receiving treatment was: *a)* the Charlson comorbidity index[18] as an approximation of the severity/seriousness of the patient's condition, and b) the individual circumstances index, obtained from the Adjusted Clinical Groups (ACG), a system for classifying patients by resource case-mix.[19,20] To construct an ACG, we must know patient age, sex, and motive for consultation or the diagnosis codified according to ICD-9-CM. The application provides the resource use bands (RUB) by which each patient is placed in one of 5 mutually exclusive categories by morbidity: *1)* healthy patients or those with very low morbidity; *2)* low morbidity; *3)* moderate morbidity; *4)* high morbidity; and *5)* very high morbidity. The geriatric assessment scales were obtained from the screening text for cognitive degeneration in the Spanish version of the Folstein Mini-Mental State Examination,[21] validated in our population, and the Barthel index for understanding the basic needs of daily life.

Analgesic consumption and study subgroups

Pharmaceutical dispensing information was obtained based on the prescriptions filled at the 3 care levels (primary care, specialised care, and social health care) according to CatSalut's application for following up on pharmaceutical prescriptions. We selected all patients receiving analgesic treatments in the following groups (determined by ATC

Table 1 General characteristics, comorbidities, and geriatric assessment scales according to non-institutionalised patient groups (n=11 119; 98%) and institutionalised patient groups (n=225; 2%) and the total (n=11 344; 100%)

Characteristics	Non-institutionalised	Institutionalised	Total	*P*	OR	95% CI
General						
Age, mean (SD), y	74.9 (6.9)	82.3 (7.9)	75.1 (7)	<.001	1.2	1.2-1.3
65-74	51.8%	15.1%	51.1%			
75-84	37.9%	48.4%	38.1%			
>84	10.3%	36.4%	10.8%	<.001		
Women	61.3%	70.7%	61.5%	.004	1.3	1-1.6
Mean events/year	8 (4)	10.6 (5.2)	8.1 (4)	<.001		
Charlson index	0.9 (1.2)	1.8 (1.7)	0.9 (1.2)	<.001		
Mean RUB/year	3 (0.6)	3.7 (1)	3 (0.6)	<.001	3.5	2.9-4.4
Comorbidities						
Arterial hypertension	61.4%	62.2%	61.5%	NS		
Diabetes mellitus	24.5%	27.1%	24.5%	NS		
Dyslipidaemia	47.3%	41.3%	47.2%	.043		
Obesity	40.4%	27.1%	40.1%	<.001		
Smoking	9.2%	4.4%	9.1%	.014		
Alcohol abuse	1.7%	3.1%	1.7%	NS		
Ischemic heart disease	11.2%	21.3%	11.4%	<.001		
Cerebrovascular accident	13.9%	29.8%	14.2%	<.001	1.3	1-1.6
Cardiovascular events	22.2%	41.8%	22.5%	<.001		
Organ failure	14.4%	27.6%	14.7%	<.001		
Asthma	5.4%	5.3%	5.4%	NS		
COPD	9.3%	9.8%	9.3%	NS		
Nervous disorders	1.6%	5.3%	1.7%	<.001	1.6	1-3.1
Dementia	3.3%	22.7%	3.7%	<.001	3.4	2.3-4.9
Affective disorders	0.7%	2.7%	0.7%	.001		
Depressive syndrome	20.2%	28%	20.4%	.004	1.3	1-1.6
Malignant neoplasias	9.4%	20.4%	9.6%	<.001	1.4	1.1-2
Neurosensory disorders	70.1%	66.2%	70%	NS		
Coagulation disorders	2.4%	2.2%	2.4%	NS		
Thyroid disorders	10.5%	11.6%	10.5%	NS		
Gastro-oesophageal reflux	2.1%	3.6%	2.1%	NS		
Peptic ulcer	3%	4.9%	3.1%	NS		
Constipation	18.2%	32%	18.5%	.001		
Osteoarticular disorder	73.7%	66.7%	73.6%	.018		
Fibromyalgia	1.6%	1.3%	1.6%	NS		
Osteoporosis	23.8%	20.4%	23.7%	NS		
Bone fractures	16.3%	28.9%	16.6%	<.001		
Urinary incontinence	18.4%	49.3%	19%	<.001	1.9	1.4-2.6
Oropharyngeal dysphagia	25.6%	58.3%	26.1%	<.001		
Geriatric scales						
MMSE Test	20.7 (11.6)	16.1 (11.8)	20.4 (11.7)	.013		
Barthel index	68.6 (29)	46.3 (32.7)	67.4 (29.7)	<.0001		

CI indicates confidence interval; COPD, chronic obstructive pulmonary disorder; NS, not significant; OR, odds ratio; RUB, resource use bands.
Values are expressed as percentages or means (standard deviation).
Logistic model: dependent variable (institutionalised patients).

classification)[22]: *a)* non-opioid analgesics (N02B: acetylsalicylic acid, salycilates, paracetamol, metamizol, etc); *b)* non-steroid anti-inflammatory drugs (NSAIDs) (M01A: ibuprofen, diclophenac, naproxen, piroxicam, celecoxib etc); *c)* minor opioid analgesics (N02A: codeine, dihydrocodeine, tramadol etc); *d)* major opioid analgesics (N02A: morphine, methadone, fentanyl, pethidine, etc); and *e)* antiepileptics (N03A: only pregabalin and gabapentin). Polypharmacy was identified as the use of more than 5 drugs (different active ingredients) during a period of more than 240 consecutive days in a year. We recorded the number of active ingredients, packets and the pharmaceutical cost per patient/year.

Statistical analysis

In a preliminary step before analysis, specifically to compile the source of information from the computerised records, we revised data carefully and observed its frequency distributions in order to search for possible recording or encoding errors. We carried out a single-variable descriptive statistical analysis with mean values, typical or standard deviation (SD) and 95% confidence intervals (CI); distribution normality was checked using the Kolmogorov-Smirnov test. The two-variable analysis used the following parametric tests: Student *t* test, ANOVA, and χ^2. A binomial logistic regression analysis was carried out, with the dependent variables being institutionalised subjects using ETS drugs (adjusted for age, sex, and RUB) with the ENTER procedure (Wald statistic) to correct the model. SPSSWIN software version 12 was used, with values of *P*<.05 being statistically significant.

Results

Out of the initial selection of 16 140 patients aged 65 years or older and assigned to PC centres, 14 564 required attention during the study period (90.2% use intensity); 11 376 (78.1%) received some type of analgesic, and lastly, 11 344 (78%) consumed oral form analgesics (95% CI, 77.2-78.8).

Table 1 describes the general characteristics of the series, comorbidities, and geriatric assessment scales for the institutionalised patient group and the non-institutionalised group. In general, median age was 75.1 (7) years; women constituted 61.5% of the total and the average was 8.1 (4) episodes/patient/year. Institutionalised subjects (2% of the total) had a higher mean age (82.3 compared to 74.9 years; *P*<.001), a higher proportion of women (70.7% compared with 61.3%; *P*=.004) and more general morbidity indicators, both in terms of average events/year (10.6 compared with 8) and RUB/year (3.7 compared with 3) (*P*<.001). In the corrected logistic model, institutionalised patients showed a relationship that was independent from age (odds ratio [OR] =1.2), female sex (OR=1.3), general morbidity (OR=3.5), stroke (OR=1.3), nervous disorders (OR=1.6), dementia (OR=3.4), depressive syndrome (OR=1.3), malignant neoplasias (OR=1.4) and urinary incontinence (OR=1.9) (*P*<.02). In this patient group, the mean scores on the geriatric assessment scales (MMSE and Barthel) were lower.

Consumption of oral analgesics made up 13.8% of the total of medication packets consumed (95% CI, 13.2-14.4), with an average of 2.3 active ingredients per patient/year.

Table 2 lists the consumption of oral analgesic per treatment group for institutionalised and non-institutionalised patients, and the use of dosage forms. Out of the patient total, 69.5% regularly consumed NSAIDs; 0.4%, major opioids; and 90.6% regularly consumed 5 or more medications (polypharmacy), broken down to 96% of institutionalised patients compared with 90.5% in the non-institutionalised group (*P*=.019). Thirty-one point three percent of the patients regularly consumed oral analgesics in ETS form. In the binary logistic model, the ETS drugs were associated with patients who had experienced a stroke (OR=2.7; 95% CI, 1.1-5.7), nervous disorders (OR=2.4; 95% CI, 1.2-6.7) and urinary incontinence (OR=1.2; 95% CI, 1.1-1.4) (*P*<.001). In institutionalised patients, the average/unit ratio of the pharmaceutical cost/patient/year (154.8 compared with 73.1 euros; *P*<.001) and the packet cost/patient (15.4 compared to 10.9 euros; *P*<.001) were higher.

The breakdown by active ingredient is shown in Table 3. Paracetamol (75%), ibuprofen (43.7%), and metamizol sodium (14.2%) were the most commonly prescribed medications. Three point one percent of patients taking NSAIDs had a history of peptic ulcers.

The consumption of ETS oral analgesic products according to the main marketed active ingredients is shown in Table 4. Out of a total of 124 876 packages/year, 27.5% were ETS (groups: 29.1% compared with 27.4%; *P*<.05). Consumption of paracetamol, tramadol, and aceclofenac was higher in institutionalised patients (54.3%, 19%, and 7.6%). We must point out that paracetamol in ETS form constituted 43.2% of its use (54.3% for institutionalised patients), and ETS ibuprofen, 21.2% (12.2% for institutionalised patients).

The use of oral analgesic dosage forms designed for ETS, according to RUB and patient age, is listed in Figure. With the exception of those patients with low morbidity, the use of ETS in institutionalised subjects was proportionally higher than in non-institutionalised patients according to different morbidity groups (Figure, A). In addition, the use of this type of delivery shows a moderate correlation with age (Figure, B).

Discussion

The organisation of PC centres in Spain, which assigns teams of professionals according to geographical area, and the growing use of computer systems in those centres provides us with an ideal framework for carrying out this type of population-level study on normal clinical practice situations, known a real data study. We must point out that proper standards are needed in the data recording methodology, referring both to patient characteristics and to the number and measurement of the variables under study. On the other hand, the results obtained should be interpreted prudently, within the scope to which they belong: health care policy, providing services and clinical management. We must be cautious when contemplating the external validity of the results, since most of the data was collected for administrative purposes. The conceptual and methodological evidence for this type of system cannot be doubted, although its practical application in our country is scarcely used, possibly because it requires extensive use of computerised systems and high data quality from the centres responsible for those data.[19,20]

Our study was based on determining the consumption level of oral analgesics in patients over 64 years of age who received attention in a regular population environment and breaking it down to compare institutionalised and non-institutionalised patients, incorporating the medications prescribed in primary, specialised and social health care (different care levels) as an approximation to care continuity. Another contribution from this study is adjusting morbidity based on a system to classify patients per resource case-mix, such as ACG.

Table 2 Oral analgesic consumption by therapeutic group, indicating institutionalised and non-institutionalised patients and dosage forms

Characteristics	Non-institutionalised (n=11 119; 98%)	Institutionalised (n=225; 2%)	Total (n=11 344; 100%)
Therapeutic groups			
Non-opioid analgesics	80.6%	84.4%	80.6%
Non-steroidal anti-inflammatory drugs	69.8%	56.9%	69.5%
Minor opioids	17%	26.7%	17.2%
Major opioids	0.4%	2.2%	0.4%
Antiepileptics	6.5%	13.8%	6.6%
Polypharmacyb	90.5%	96%	90.6%
Total mediations			
Number of packets	879 569	26 120	905 689
PhC, euros	11 130 911.6	351 824.6	11 482 736.1
Mean no. AI/patient	14.2 (7.3)	20.4 (12.8)	14.4 (7.7)
Mean no. packets/patient	79.1 (56.2)	116.1 (76.4)	79.8 (56.9)
Mean no. PhC/patient	1001.1 (982.8)	1563.7 (1460.5)	1012.2 (997.5)
Analgesics (therapeutic group)			
Mean packets/total	13.8%	13.3%	13.8%
Mean PhC/total	7.3%	9.9%	7.4%
Mean no. AI/patient	2.3 (1.5)	3.4 (1.6)	2.3 (1.5)
Mean no. packets/patient	10.9 (13.3)	15.4 (17.1)	11 (13.4)
Mean no. PhC/patient	73.1 (137.5)	154.8 (339.3)	74.7 (144.7)

AI indicates active ingredients; ETS, easy-to-swallow form; NS, not significant; PhC, pharmaceutical cost.
Values are expressed as percentages or means (standard deviation).
[a]Compares ETS with solids.
[b]Regular use of more than 5 medications during a period longer than 240 days/year.

The general results from the study show that the consumption of oral analgesics in elderly patients is very widespread. In addition, institutionalised patients were older, with a higher proportion of women, a higher morbidity rate (episodes/RUB), more cognitive deterioration, and more functional needs in daily life. These results are consistent and apparently logical, according to different bibliographic sources that were reviewed for the population.[8-10,23-25]

Out of the total drugs prescribed for our target population, the consumption of oral analgesics amounted to 13.8% of the total drug packets, with an average of 2.3 active ingredients per patient/year. It is important to note that 69.5% of patients regularly consumed an NSAID, while only 17.6% took opioids. Some authors claim that the mean number of drugs consumed in the primary care environment is from 2-4, while this could be as high as 6-8 in residential centres, and these numbers could increase even more in a hospital environment.[25-29] Our consumption data is significantly higher than that shown in some international series we reviewed, for various reasons: *a)* due to including all pharmaceutical prescriptions regardless of the care level in question; *b)* due to including on-demand, chronic or regular use medications for any type of pain; *c)* due to the fact that drugs for elderly patients are free of charge; *d)* due to the profile of the prescribing doctor; and *e)* due to insufficient coordination between care levels. The results seem to indicate that there are some overuse profiles, which can lead to a higher risk of adverse effects, drug interactions and medication errors.[6-10] However, one limitation to the study is the fact that it is impossible to relate analgesic prescription to pain, especially for prescriptions of anti-inflammatory drugs. Therefore, it is not appropriate to reach conclusions about the suitability of the prescriptions or about pharmacological pain management. In addition, some clinical practice guides state that the WHO's analgesic ladder is not effective for all types of pain, since rungs 4 and 5 were recently added for more aggressive treatments. It is still valid for chronic pain, but in any case, the drug must be prioritised according to the critical intensity and major opioids must be used if the intensity of the pain so requires, without first passing through the NSAIDs or minor opioids. The high percentage of NSAIDS and the low use of opioids shown by the study suggest that these recommendations were not followed, although these data is not surprising. As a result, all health professionals are conscious of the need to reduce unjustified drug consumption and promote strategies aimed at fostering rational use of medications with safety and effectiveness criteria.[30,31]

The greatest use of ETS has a positive correlation to age and certain pathological states, such a stroke, nervous disorders, and urinary incontinence. The analysis of ETS use is very limited by the availability of each active ingredient in ETS form. The use of ETS forms of paracetamol, tramadol, and acelofenac was higher in the

P	ETS (n=3545; 31.3%)	Solid (n=5635; 49.7%)	Both forms (n=2164; 19.4%)	*P*[a]
NS	89.3%	69.8%	94.8%	<.001
<.001	60.0%	69.7%	84.8%	<.001
<.001	15.3%	12.8%	31.6%	<.001
<.001	0.3%	0.3%	0.8%	.004
<.001	4.5%	6.3%	11%	<.001
.019	90.9%	87.8%	97.4%	<.001
	279 796	402 824	223 069	
	3 515 547.5	5 203 674.1	2 763 514.5	
<.001	14.1 (7.2)	13.1 (6.9)	18.2 (8.4)	<.001
<.001	78.9 (56.6)	71.4 (52.6)	103.1 (61.7)	<.001
<.001	991.6 (957.6)	923.4 (962.4)	1277 (1100.7)	<.001
NS	13.4%	11.6%	18.2%	
NS	6.7%	5.7%	11.3%	
.045	2.2 (1.4)	2 (1.2)	3.3 (1.6)	<.001
<.001	10.6 (14.3)	8.2 (10.2)	18.8 (16.2)	<.001
<.001	66.6 (125.4)	52.9 (121.7)	144.7 (198)	<.001

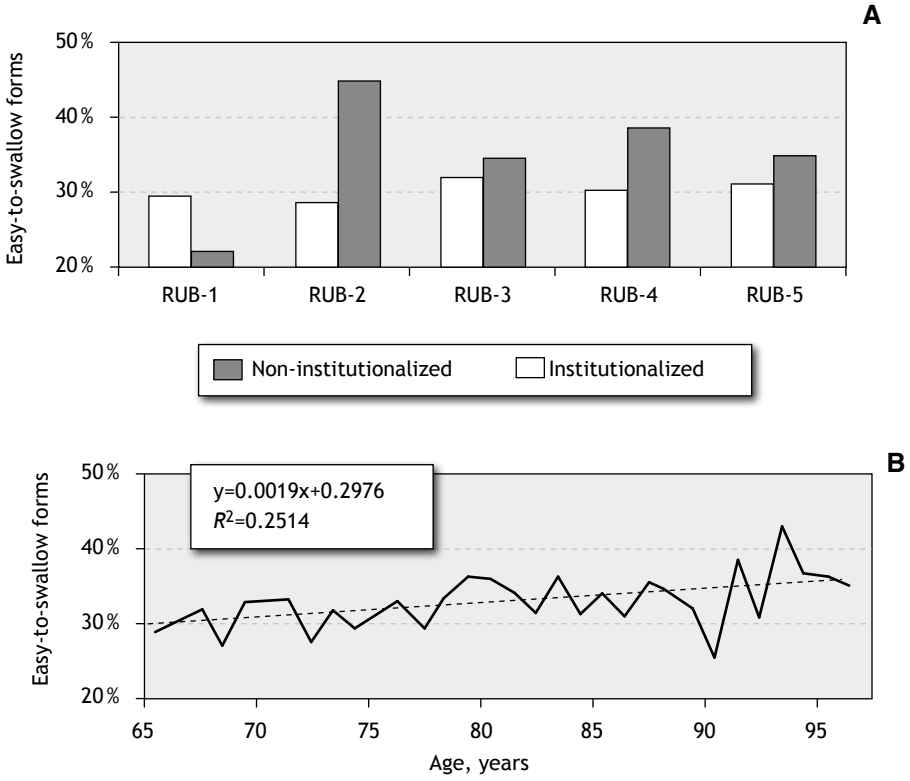

Figure 1 Distribution of the dosage forms for easy-to-swallow oral analgesics according to resource use bands (RUB) (A) and patient age (B).

Table 3 Consumption of oral analgesics (therapeutic groups and active ingredients) according to institutionalised and non-institutionalised patient groups and use of oral dosage forms

Active ingredients	Non-institutionalised (n=11 119; 98%)	Institutionalised (n=225; 2%)	Total (n=11 344; 100%)
Non-opioid analgesics			
Sodium metamizol	14%	21.8%	14.2%
Paracetamol	74.9%	80%	75%
Non-steroidal anti-inflammatory drugs			
Aceclofenac	10.3%	7.6%	10.3%
Celecoxib	3.3%	2.2%	3.3%
Dexibuprofen	1.5%	1.8%	1.6%
Dexketoprofen	10.1%	8%	10%
Diacerein	2.2%	0.4%	2.2%
Diclofenac	13.3%	9.8%	13.2%
Ibuprofen	43.8%	37.8%	43.7%
Indometacin	2.2%	1.3%	2.2%
Lornoxicam	1.9%	1.3%	1.9%
Meloxicam	3.9%	1.3%	3.8%
Naproxen	4%	1.8%	4%
Piroxicam	1.2%	1.3%	1.2%
Minor opioids			
Tramadol	9.4%	18.7%	9.6%
Major opioids			
Morphine	0.3%	1.8%	0.3%
Combination of analgesics			
Acetylsalicylic acid	1.2%	0.9%	1.2%
Codeine	2.3%	1.3%	2.3%
Diclofenac	1.6%	2.2%	1.7%
Paracetamol	6.1%	6.7%	6.2%
Tramadol	7.5%	10.2%	7.5%
Antiepileptics			
Gabapentin	3.3%	8.9%	3.4%
Pregabalin	3.5%	6.2%	3.5%

ETS indicates easy-to-swallow form; NS, not significant.
[a]Compares ETS with solids.
Consumption by <1% patients for: acetylsalicylic acid, mefenamic acid, niflumic acid, lysine clonixinate, etoricoxib, phenylbutazone, fentanyl, fluribibrofen, fosfosal, ketoprofen, methadone, oxaceprol, oxycodone, penicillamine, pyrazolones, sulindac, and tenoxicam.

Table 4 Consumption of easy-to-swallow oral analgesics by active ingredient, indicating institutionalised and non-institutionalised patients

Active ingredients, n (%)	Total in series 124 876 (27.5)	Non-institutionalised 121 414 (27.4)	Institutionalised 3462 (29.1%)
Paracetamol	54 679 (43.2%)	53 265 (42.9%)	1414 (54.3%)
Ibuprofen	15 338 (21.2%)	14 976 (21.4%)	362 (12.2%)
Tramadol	5044 (13.5%)	4823 (13.2%)	221 (19%)
Dexketoprofen	4443 (13.2%)	4316 (13.4%)	127 (7.1%)
Diclofenac	4274 (9.6%)	4205 (9.7%)	69 (1.4%)
Aceclofenac	3928 (2.2%)	3849 (2.1%)	79 (7.6%)

Values expressed in packets/year (%). Statistical significance is $P<.05$ for all cases. The table lists the 6 highest-consumed active ingredients.

P	ETS (n=3545; 31.3%)	Solid (n=5635; 49.7%)	Both forms (n=2164; 19.4%)	*P*[a]
.001	10.8%	13.8%	20.8%	<.001
.047	85%	62.3%	91.9%	<.001
NS	8.1%	10%	14.5%	<.001
NS	2.3%	2.9%	5.8%	<.001
NS	1%	1.6%	2.4%	<.001
NS	8.8%	8.8%	15%	<.001
NS	1.4%	2%	3.9%	<.001
NS	10.7%	12.4%	19.5%	<.001
.042	39.5%	41.3%	56.7%	<.001
NS	1.4%	2.5%	2.6%	.001
NS	1.4%	1.8%	3.1%	<.001
.049	2.7%	3.5%	6.6%	<.001
NS	2.7%	4.1%	5.7%	<.001
NS	1.4%	0.5%	2.5%	<.001
<.001	7.8%	6.8%	19.6%	<.001
<.001	0.2%	0.3%	0.6%	.014
NS	1.7%	0.3%	2.5%	<.001
NS	3.5%	0.7%	4.7%	<.001
NS	1%	1.8%	2.3%	.001
NS	8.2%	3.8%	8.8%	<.001
NS	5.7%	6.4%	13.4%	<.001
<.001	2.1%	3.4%	5.6%	<.001
.027	2.7%	3.2%	5.8%	<.001

institutionalised group than the non-institutionalised group, which could be due to the older age and base illness in institutionalised patients. However, it could also be expected that pharmaceutical attention in residences is more personalised. However, even if the above is true, the preference for these forms is not as high as one might think. It is true that the real availability of ETS on the market has not been analysed. Neither have we studied whether economic factors exist that could limit access by the elderly, or whether the medication substitutions stemming from the current Reference Price System legislation could mean that the medications that are dispensed may be less suitable to individual patient needs. In summary, this study does not offer an explanation as to why a group of patients with a decreased physiological ability to swallow does not show a higher preference rate for ETS medications; rather, it shows that real use does not correlate with what one might expect.

Given that difficulty in swallowing pills can be a cause for elderly patients failing to comply with treatment, added to other factors such as managing multiple medications, adverse effects, underlying illness and age-related degeneration, it is important for health care professionals and caregivers to have the ability to detect and solve such a simple problem as selecting the most appropriate dosage form for the elderly patient.

In pharmacokinetics, the pharmaceutical form, the excipients and fabrication conditions play an important role

in the liberation of the active ingredient within the digestive tract lumen. It is known that the Spanish market lacks the EST drugs that would be appropriate for patients with certain conditions, such as elderly patients or children with oral-pharyngeal dysphagia. For this reason, products need to be manipulated in some way, if they are solid, or we should resort to the versatile liquid forms to adapt them to patients' needs, despite the fact that it is not always possible to make these preparations, since the necessary bibliography is often not available, or there is no data on the stability of the preparation.[12,13,32]

Possible limitations of the study include methodology design factors that could exert an influence during the study. The article shows the limitations common to retrospective studies, such as, for example, underreporting the disease, the possible variation between professionals in the systematic use of different filtering/clinical diagnosis scales for diseases, and the measurements for some variables, such as the consumption of oral analgesics in defined daily doses.[22] In addition, other methods of administration were not included, and could reflect higher use of opioids (for example, transdermal fentanyl or buprenorfine). Possible selection or classification biases include residents' geographical or seasonal mobility, possible variations in the observed severity or morbidity profile, and the quantification of the ETS themselves. We must also consider possible administrative errors in the assignment of prescription slips to prescribing doctors in PC centres, as these could influence study results. Future investigations should promote steps to improve analgesic pharmacokinetics and complete clinical trials that reinforce drug indication-prescription with cost-effective results. In addition, it would be important to strengthen coordination mechanisms between different care levels and the pharmacy supervisors in the sector. To conclude, consumption of oral analgesics is high, particularly in institutionalised patients. There is a marked overuse of NSAIDs and underuse of opioids. The underuse of ETS reflects these drugs' availability on the market, despite the high prevalence of dysphagia in our target population.

Acknowledgments

We would like to thank all of the health professionals in the organisation without whose constant addition of data on a daily basis this study could not have been completed. Many thanks to M. Carmen Ruiz, M. Serrano, and C. Varas for their comments on the methodology, and to the manuscript editors for their contributions.

Conflict of interest

This study has been financed by Grünenthal Laboratories and Spanish Social Security's Fund for Health Research (PI05/2837) without this having any influence whatsoever on the results.

Information confidentiality

Confidentiality as defined by law was respected at all times.

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