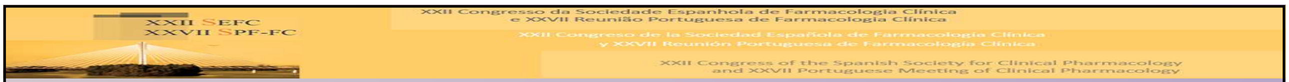

DETERMINATION OF PHARMACOTHERAPEUTICAL COMPLEXITY IN INSTITUTIONALIZED ELDERLY

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INTRODUCTION

The phenomenon of aging in nowadays society has acquired the status of a social problem, with growing attention and concern, leading to an increase number of studies dedicated to the elderly. [1,2]
The lack of domestic, familiar or social support often lead elderly to nursing homes. Institutionalization is in many cases the only opportunity to have access to health care and life quality. [1,3]

Aging is also associated with a higher prevalence of chronic diseases that require long term medication sometimes for life. Frequently the onset of multiple pathologies at the same time require different therapies and the phenomenon of polypharmacy (five or more drugs daily) can occur. Even more, the slow down of physiological and cognitives mechanisms associated with these chronic diseases can interphere, in one hand, with the pharmacocinetic of many medications and, on the other hand, with the facility to accomplish the therapeutical regimen. All of this realities contribute to an increase of pharmacotherapeutical complexity, decreasing the adherence and effectiveness of treatment. [4,5]

The pharmacotherapeutical complexity of an individual is characterized by the conciliator element of different characteristics of their drug therapy, such as: the number of medications used; dosage forms; dosing frequency and additional indications. It can be measured by the Medication Regimen Complexity Index (MRCI), originally validated in English by Johnson *et* al (2004). [6,7]

METHODOLOGY

OBJECTIVE
Determine the pharmacotherapeutical complexity index in institutionalized elderly in the interior and littoral regions of Portugal, between February and September 2009 by the MRCI.

STUDY DESIGN
Cross-sectional study.

LOCAL OF DATA COLLECTION
Five nursing homes divided by Évora and Lisbon districts.

DATA COLLECTION INSTRUMENT
Form based in MRCI.

Total number of drugs:

(Including all medicines – sos and non-prescription drugs)

Trade Name	Dosage	INN	Dosage Form	Dosing Frequency	Additional indications

Dosing Frequency	Medications	Total	Weighting	Total x Weighting
1x day			1	
1x day if necessary			0.5	
2x day			2	
2x day if necessary			1	
3x day			3	
3x day if necessary			1.5	
4x day			4	
4x day if necessary			2	
12/12h			2.5	
12/12h if necessary			1.5	
8/8h			3.5	
8/8h if necessary			2	
6/6h			4.5	
6/6h if necessary			2.5	
4/4h			6.5	
4/4h if necessary			3.5	
2/2h			12.5	
2/2h if necessary			6.5	
If necessary			0.5	
On alternate days or less frequently			2	
Oxygen (if necessary)			1	
Oxygen<5h			2	
Oxygen >15h			3	

Total for Section B

Dosage Forms		Weighting
Oral	Capsules/ Tablets	1
	Gargles/ Mouthwashes	2
	Gums/ Lozenges	2
	Liquids	2
	Powders/ Granules	2
	Sublingual sprays/ tabs	2
Topical	Creams/ Gels/ Ointments	2
	Dressings	3
	Paints/ Solutions	2
	Pastes	3
	Patches	2
	Sprays	1
Ear, Eye & Nose	Ear drops/ Creams/ Ointments	3
	Eye drops	3
	Eye gels/ Ointments	3
	Nasal drops/ Cream/ Ointment	3
	Nasal spray	2
Inhalation	Accuhalers	3
	Aerolizers	3
	Metered dose inhalers	4
	Nebuliser	5
	Oxygen/ Concentrator	3
	Turbuhalers	3
	Others DPI's	3
Others	Dialysate	5
	Enemas	2
	Injections:	
	- Prefilled;	3
	- Ampoules/ Vials	4
	Pessaries	3
	Patient controlled analgesia	2
	Suppositories	2
	Vaginal Creams	2

Total for Section A

Additional indications	Medications	Total	Weighting	Total x Weighting
Break or crush tablet			1	
Dissolve table/powder			1	
Multiple units at one time (e.g. 2 tabs, 2 puffs)			1	
Variable Dose (e.g. 1-2 caps, 2-3 puffs)			1	
Take/use at specified time/s (e.g. morning, night, 8 AM)			1	
Relation to food (e.g. with food, before meals, after meals)			1	
Take with specific fluid			1	
Take/use as indicated			2	
Increase/decrease dose			2	
Alternating dose (e.g. 1 morning & 2 night, 1/2 on alternate days)			2	

Total for Section C

Medication Regimen Complexity Index

Total for Section A + Total for Section B + Total for Section C

POPULATION & SAMPLE
There are 63.487 institutionalized elderly in Portugal. The sample was selected by a non probablistic method, with a total of 415 elderly.

The sample included all individuals aged 65 years or older, institutionalized in an internal regime and with daily administration of at least one drug.

DATA PROCESSING & STATISTICAL ANALYSIS
SPSS, Version 16.0 using Pearson correlation and T-student test.

RESULTS

The results refer to five nursing homes, two located in the interior and three located in the littoral, contributing to a sample with 210 and 205 elderly, respectively.

The sample submitted is mainly female, 60,24%, but as age progresses, the difference between the genders decreases.

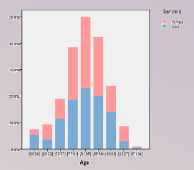

Figure 1 Characterization of the sample group by gender

Ages ranged from 65 to 98 years old, with an average of 83 +/- 7 years old. Women had higher mean age, 83,7 +/- 6,2 years old, than men 82,7 +/- 7,05 years old.

Institutionalized elderly on interior of Portugal were older with 84 +/- 6 years old than the littoral with 83 +/- 7 years old.

The results for the daily consumption of each drug revealed that elderly took an average of 8,22 +/- 3,56 drugs per day, a range that varies between a minimum of 1 and a maximum of 20 drugs.

The average daily consumption of drugs was higher among women, 8,9 +/- 3,39 drugs than in men, 7,2 +/- 3,57 drugs, both in the interior , 8,37 +/- 3,36 drugs and littoral, 8,06 +/- 3,75 drugs.

The polypharmacy was found in 85,5% of the sample.

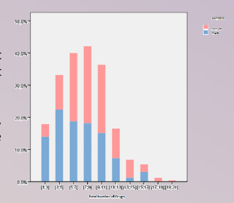

Figure 2 Characterization of the daily consumption of drugs by gender

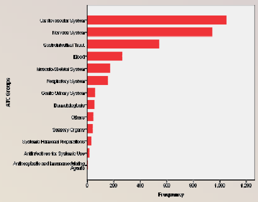

Figure 3 ATC groups in pharmacotherapy

The more common dosage form in the pharmacotherapy were tablets and capsules, 84,5% of the total.

Of all the drugs consumed, the most prevalent were for the cardiovascular system (30,8%), nervous system (27,7%) and gastrointestinal system (15,9%).

Table 1 Top five drugs most consumed

Drug	ATC	Frequency (N= 415)	
		Absolute	Relative
Acetylsalicylic Acid	(B01AC06)	132	31,8%
Simvastatin	(C10AA01)	117	28,2%
Furosemide	(C03CA01)	95	22,9%
Paracetamol	(N02BE01)	77	18,6%
Omeprazole	(A02BC01)	71	17,1%

The drug most commonly used, was Acetylsalicylic acid 100mg and 150mg, as an antiplatelet aggregation agent, with 31,8%.

The Acetylsalicylic acid integrates the WHO guidelines for cardiovascular disease, in patients with cardiovascular risk, with an initial dose of 75mg per day. [8-10]

Benzodiazepines as a therapeutic class were present in the pharmacotherapy of 40% of the sample, mainly due to the syndromes of anxiety and sleep disturbances observed in the elderly. [11,12]

The MRCI average was 18,24 +/- 9,66, between a minimum of 2 and a maximum of 53,5. The MRCI was higher in the interior, 18,94 +/- 9,43 compared to the littoral, 17,52 +/- 9,86 and much higher in women, 19,63 +/- 9,22 compared to men, 16,14 +/- 9,96.

According to the Pearson Correlation, the MRCI grew as the number of medications consumed increased. The greater the age, the lower the MRCI and the number of medications consumed, contrary to what is normally reviewed in the literature. [13]

The correlation observed between the MRCI and its three sections(A, B and C) shows the direct contribution of each to the growth of total MRCI. The section B, dosing frequency, was the largest contributor to the increase in the MRCI.

Statistical tests showed no significant differences in the MRCI and the number of medications consumed between genders, regions and presence or absence of a health professionals in the pharmacy of the nursing home.

CONCLUSIONS

The MRCI showed to be and important tool in monitoring pharmacotherapeutical complexity in nursing homes of Portugal. This type of follow up, can contribute to the reduction of problems associated with drugs in this group of people and increase adherence to therapy in the institutionalized elderly. The pharmacotherapeutical complexity were mainly higher, predicting the need for further intervention in the pharmacotherapy of institutionalized elderly.
The prospect for studies in this area is vast as the problems of elderly and their pharmacotherapy urges for future research.

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