

Qualitative analysis of prescriptions in the residents of three nursing homes in Loire-Atlantique

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INTRODUCTION

Drugs side effects are a complex problem in very elderly poly pathological and "fragile" patients in nursing homes. Better prescribe in this population is a major concern in order to reduce the number of hospitalizations and the number of iatrogenic events (bad indication, non-compliance with the contra-indications, excessive dosage or excessive prolonged treatment).

Better prescribe improve the quality of care. Clinical or epidemiological studies rarely include very elderly population, so the aim of this study is to analyze the medical management of residents of three nursing homes in Loire Atlantique, France.

METHODS

Qualitative analysis of drug treatment of 100 residents in three nursing homes in Loire Atlantique according seven quality criteria [Ref "French Good Practices care in nursing homes" and French National Authority for Health (HAS)]:

- Number of lines of drugs per prescription,
- How the medication is taken: accuracy of dosing, duration of treatment, optimizing efficacy / safety, compliance with the marketing authorization
- Treatment adaptation to the patient profile (age and diseases)
- Over-use of certain drugs,
- Under-use of certain drug classes (whose effectiveness is demonstrated yet in terms of quality of life and / or morbidity and mortality)
- Misuse of drugs with iatrogenic risk,
- Drug interactions.

RESULTS

	Nursing home 1	Nursing home 2	Nursing home 3	TOTAL
Number of residents per nursing home	88	75	77	240
Number of studied prescriptions	20	19	61	100
Age average (years)	91	87	83	87
Men number	4	6	13	23
Women number	16	13	48	73
Average number of lines per prescription	8	4	9	7

Table 1: Nursing home profile, number of drugs per patient

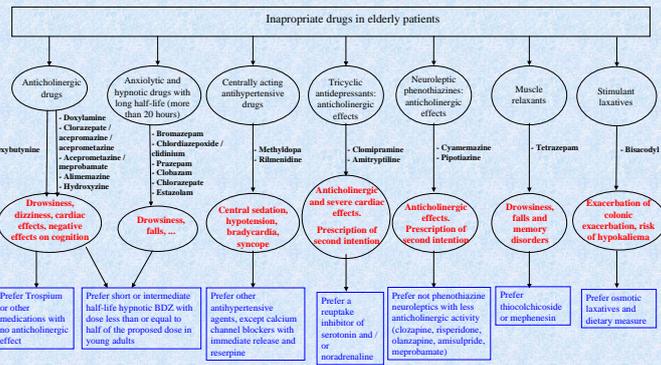


Figure 2: Drugs inappropriate for very elderly patients found in the studied prescriptions (2,5)

1) Over-use of certain drug classes

- CEREBRAL VASODILATORS (Ginkgo biloba extract, moxisylyne, pentoxifylline, ...): questionable efficacy, not clearly demonstrated for most cerebral vasodilators: risk of orthostatic hypotension and falls in the elderly
- ANXIOLYTIC and HYPNOTIC DRUGS WITH LONG HALF-LIFE (diazepam, chloridiazepoxide/cnidium, prazepam, clobazam, chlorazepate, estazolam, ...) the prescribed dose should be reduced compared with young adults, it is preferable to choose short half-life benzodiazepine (BZD). Reassess treatment and stop if behavioral disorder.
- INHIBITORS OF PROTON PUMP, long-term use in dyspepsia, risk of prolonged secretory inhibition, risk of hip fracture and sarinfection with *Clostridium difficile*.
- LAXATIVES: Reassessing the rules and dietary
- NEUROLEPTIC DRUGS: behavioral disorders in the patient with dementia, associations of neuroleptics should be avoided.
- DRUGS WITH ANTICHOLINERGIC EFFECTS (tricyclic antidepressants, phenothiazines neuroleptic drugs, antispasmodics and hypnotics with anticholinergic properties, antihistaminic drugs, ...)
- DRUG ASSOCIATIONS: 2 or more than two psychotropic drugs of the same therapeutic class (BZD, neuroleptics, antidepressants): no improvement in the efficiency and greater risk of adverse effects

2) Under-use of certain drug classes

	Nursing home 1	Nursing home 2	Nursing home 3	TOTAL
- Antidepressants				
- Antihypertensive drugs				
- Vitamins and calcium intake for osteoporosis				
- DEMENTIA TREATMENT				
Number of patients with Alzheimer disease	3 women	1 man	3 women	7 patients (including 6 women)
Number of patients with non Alzheimer dementia	0	5 women	8 women	14 patients (including 13 women)
Number of prescriptions with Alzheimer treatment (anticholinesterasic or memantine)	2 prescriptions	1 prescription	10 prescriptions	13 prescriptions

Table 2: "Over use", "under use" and "misuse" (3-5)

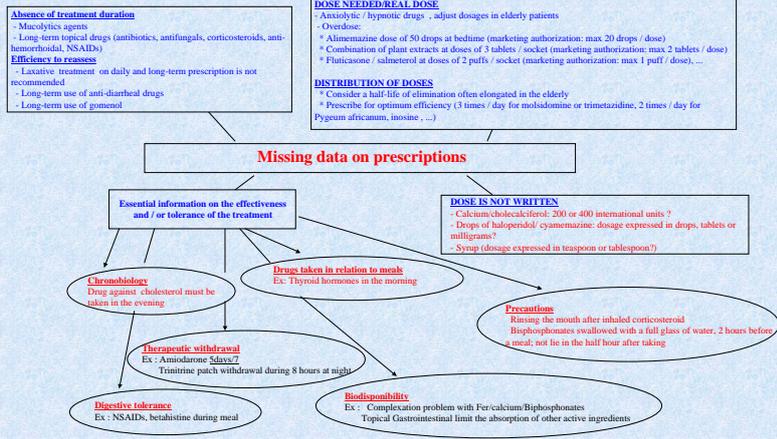


Figure 1: Missing data on prescriptions regarding recommendations (1)

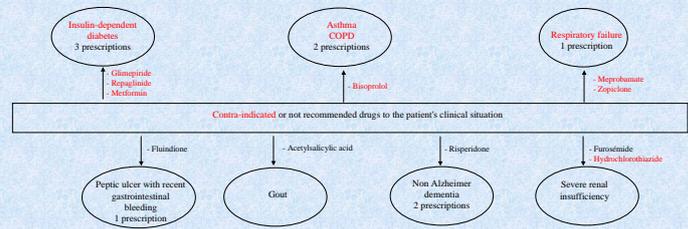


Figure 3: Prescriptions contra-indicated or not recommended in view of the clinical profile of patients in studied prescriptions (4)

ASSOCIATION CONTRA-INDICATED (relative):

- 1 prescription with risk of hyperkalemia (unless existing hypokalemia) (HYPERKALEMIC DIURETIC - POTASSIUM)

5 types of Associations not recommended, with 19 prescriptions involved:

For example:

- 4 prescriptions with antagonistic receptor association (DOPAMINE AGONIST such as levodopa and NEUROLEPTIC drugs)

10 types of USE PRECAUTIONS, with 57 prescriptions involved (several precautions in prescription):

For example:

- Increased effect of oral anticoagulation and risk of bleeding (Flutidone + levofloxyacin, fibrates, ANTIDEPRESSANTS, acetaminophen- 4g/day for at least 4 days ...)
- Risk of sudden hypotension and / or acute renal failure, in case of existing sodium depletion (hypokalemic DIURETIC + angiotensin-converting enzyme inhibitor / Sartan)
- Risk of lactic acidosis, triggered by possible functional renal failure (METFORMIN + FUROSEMIDE)

12 types of interactions with 69 prescriptions involved (several cases by prescription):

For example:

- Increased risk of hypotension, including orthostatic hypotension (addition of effects: NITRO DERIVATIVES, NEUROLEPTIC drugs, hypotensive drugs)
- Increased risk of hyponatremia (DIURETIC + ANTIDEPRESSANTS, DIURETICS association)
- Risk of decreased efficacy of anticholinesterasic drug and risk of "cholinergic" attack in case of discontinuation atropinic treatment (atropinic drug + cholinesterase inhibitor)

Figure 4: Drug Interactions identified in the 100 studied prescriptions, according to the THESAURUS 30/06/2009 (6)

DISCUSSION

Patients in nursing homes are very old, their average age is 87 years in the three studied nursing homes, with 77% of women and 23% men. These patients are polymedicated with an average of 7 lines per prescription. There is a significant difference (a factor of two) between the nursing homes. We can assume that the number of lines required depends in part on prescribing habits of physicians and recommendations given by the coordinating physician (Table 1).

The guidance on making the requirements are not always precise enough to ensure a good quality of administration to the patient by the caregiver (Figure 1).

Each nursing home must provide guidelines to caregivers on medication administration (including a list of medications that can be crushed or opened).

Very elderly patients with multiple diseases are much more susceptible to iatrogenic effects of drugs (including anticholinergic effects) (Figures 2 and 3). One cause is the physiological changes of the drug in the aged organism. Impaired elimination of drugs deteriorate with advancing age and contribute to increase the pharmacological effect and therefore the dose-dependent side effects.

Among the elderly, there is changes in the pharmacokinetics such as reduced renal function (drug dosage in renal elimination must be adapted to the glomerular filtration rate), hemoconcentration and hypoproteinemia in malnourished patients (potential risk of overdose of drugs strongly attached to plasma proteins), musculoskeletal loss and fat gain (the volume distributions changed: fat / lean mass, so lipophilic drugs tend to be stored and salted), a change in the permeability of the blood-brain barrier (greater sensitivity to drugs acting on the central nervous system, particularly sedative greater). However, it does not seem so far to have obvious clinical translation of a lesser hepatic metabolism of drugs that may be due to age.

Concerning pharmacodynamics, aging of the heart (especially the loss of contingent nodal cells), may cause increased sensitivity to certain drugs (disorder or conduction block), and bone fragility requires monitoring particularly the risk of hypotension orthostatic linked to certain drugs (falls, fractures). Some drugs become inappropriate in the very elderly, and others should have their dosage adjusted.

These adaptations are not always done in practice (Figures 2 and 3) and the prescription requires regular medical adaptation (diagnostic reassessment and prioritization of diseases and treatments as reported efficacy / safety and individual benefit / risk, clinical and biological certain treatments) (Table 2), and at any intercurrent event (dehydration, congestive heart failure, infectious disease or new disease ...). These intercurrent acute episodes (and their consequences such as renal failure) explain that even medications for a long time may cause an accident drug. The practitioners should have the reflex "iatrogenic" to anorexia, malaise, a fall, delirium... and check that the symptoms presented by the patient are not side effects of a drug or a combination drugs with a drug interaction (Figure 4).

CONCLUSION

A medication etiology should be systematically considered in any alteration of patient general condition (falls, loss of independence or clinophilia). Many quality criteria concerning the proper use of a drug are not implemented despite recommendations of the HAS and "Best Practices care" in nursing homes. Iatrogenic is a complex issue and it is essential to build trainings for practitioners to improve the appropriate use of medication in this population at risk. The aim is to fill the gap between, firstly, recommended practices, and secondly, practices observed.

Références

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