



Inappropriate Prescriptions according to STOPP and related hospital admission in geriatric patients

O. Dalleur^{1,*}, C. Deliens⁵, C. Losseau², S. Henrard³,
N. Speybroeck³, A. Spinewine⁴, B. Boland²

1 Pharmacy department and 2 Geriatric Medicine, St-Luc Hospital, UCL, Brussels

3 Institute for Health and Society, UCL, Brussels

4 Louvain Drug Research Institute and CHU Mont-Godinne, UCL

5 Pharmacy, Institut Jules Bordet, ULB, Brussels

Belgium

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Introduction

- Many drugs can be considered as inappropriate in geriatric patients.
- Several tools to detect inappropriate prescription in elderly : Beers, Laroche, STOPP-START ...

STOPP (Screening Tool of Older Person's Prescriptions) and START (Screening Tool to Alert doctors to Right Treatment). Consensus validation *International Journal of Clinical Pharmacology and Therapeutics*, Vol. 46 – No. 2/2008 (72-83)

Screening Tool of Older Persons' Potentially inappropriate Prescriptions *Age and Ageing* 2008; 37: 673–9



Introduction

- STOPP&START
 - European
 - Consensus opinion of a panel of experts in geriatric medicine, clinical pharmacology, psychiatry of old age, pharmacy and general practice.
- STOPP : 65 situations « at risk » linked with 29 drugs
- *Cardiovascular system, Central nervous system and psychotropic drugs, Gastrointestinal system, **Drugs that adversely affect fallers**, Analgesic drugs,...*



STOPP List

65 situations, 29 drugs

Drug	Risk situation
• Digoxin	> 125µg/d + impaired renal function (GFR < 50ml/min)
• Loop diuretic	1 st -line monotherapy for hypertension; ankle edema without heart failure
• Thiazide diuretic	history of gout
• B-blocker	COPD; diabetes + frequent hypoglycemic episodes
• Dil/Ver	NYHA class III or IV heart failure
• CCB	chronic constipation
• Vasodilators	postural hypotension
• Dipyridamole	monotherapy for CV P2
• Aspirin	+VKA/peptic ulcer without antiH2/PPI; ≥ 150 mg/j; dizziness, CV P1
• VKA	+aspirin/clopidogrel:dipyridamole with concurrent bleeding disorder; duration(>6 m and DVT ; 12 m and PE)



STOPP List

65 situations, 29 drugs

- | Drug | Risk situation |
|--------------------|---|
| • TCA's | dementia; glaucoma ; cardiac conductive abnormalities ; constipation ; + opiate or CCB ; prostatism |
| • BZDs | fall; Long-term long-acting |
| • Neuroleptics | fall; Long-term+Parkinson ; phenothiazines+epilepsy ; long-term as hypnotic |
| • Anticholinergics | to treat side effects of neuroleptics ; antispasmodic drugs+chronic constipation |
| • SSRIs | hyponatremia (< 130 mEq/L) |
| • Antihistamines | of first-generation antihistamines > 1 week ; fall |
| • Loperamide | diarrhea of unknown cause; severe infective gastroenteritis |
| • Codéine | diarrhea of unknown cause; severe infective gastroenteritis |
| • IPP | for peptic ulcer disease at full therapeutic dosage > 8 weeks |



STOPP List

65 situations, 29 drugs

- | Drug | Risk situation |
|----------------------|---|
| • Theophylline | monotherapy for COPD |
| • Corticosteroids | systemic instead of inhaled in moderate-to-severe COPD; monotherapy for rheumatoid arthritis or osteoarthritis |
| • Ipratropium | glaucoma |
| • NSAID | peptic ulcer without antiH2/PPI ; moderate-to-severe hypertension ; heart failure ; mild osteoarthritis ; +VKA ; chronic renal failure ; long-term to treat gout + no CI to allopurinol |
| • Colchicine | long-term to treat gout + no CI to allopurinol |
| • Anti-diabetics | long-acting (glibenclamide, chlorpropamide) |
| • Estrogens | breast cancer or venous thromboembolism ; without progestogen in patients with intact uterus |
| • α -blockers | ♂ incontinence ; long-term urinary catheter |
| • Antimuscarinic | dementia ; glaucoma ; prostatism ; constipation |
| • Opiates | fall ; powerful as 1 st -line for mild-to-moderate pain ; >2w with constipation without laxatives; dementia unless palliative care/management of moderate/severe chronic pain syndrome |





Purpose

**To study the performance of STOPP
in detecting inappropriate prescribing (IP)
and
related acute hospital admission
in frail older people.**



Methods

- Study: transversal retrospective study

- Eligibility:
 - acute hospital admission (not in a geriatric unit) in 2008
 - age ≥ 75 years
 - frailty score ISAR $\geq 2/6$
 - CGA by the geriatric liaison team

- Data collection
 - **geriatric** : social situation, functional/mental status, nutrition
 - **medical** :
 - detailed medical history/comorbidities (including GFR)
 - drug list at home
 - Main reason for admission



Methods

■ End points

- ✓ IP events at home
- ✓ Hospitalisation related to IP
 - *IP = inappropriate prescription = the patient receives a drug he should not receive according to STOPP criteria*

■ Analyses

- Comparison of drug list according to STOPP criteria by a clinical pharmacist and a geriatrician **to detect IP**
- Frequency measures (prevalence, proportion)
- Determination of relation between hospital admission and IP based on **clinical judgement**.



Results 1 : population characteristics

302 frail older people

Age 84 years \pm 5; ♀ 62 %

Home 83 % (alone 43 %) vs. nursing home 17 %

ISAR score : 2 - 6 / 6 ; average 3,5 \pm 1

■ Geriatric Syndromes

- falls (58 %),
- malnutrition (30 %),
- cognitive decline (25 %),
- depression (25 %)

■ Co-morbidities

- hypertension (55 %),
- ischemic CV diseases (40 %),
- osteoporosis (26 %),
- atrial fibrillation (25 %),
- diabetes (23 %),
- COPD (15 %)

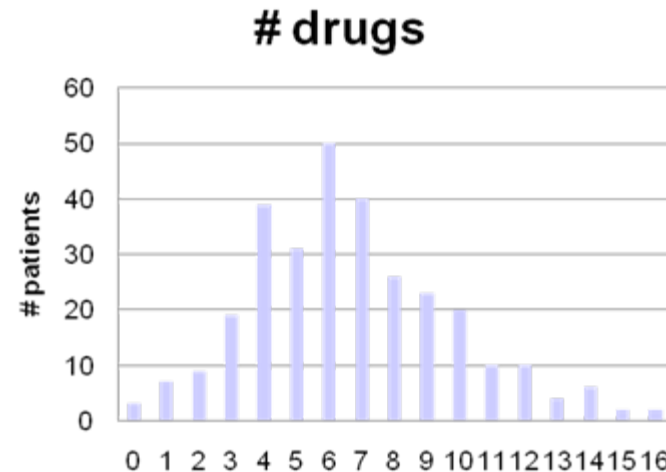


Results 2: drugs before admission

Drugs:

2.028 drugs (7 ± 3)

≥ 5 drugs/day : 74 %



Detection of **210** IP events

in 2.028 medications at home (~ 1 drug/ 10)

in 144 patients (144/302) : prevalence 48 % (~ 1 patient/ 2)

Distribution : 0 (52 %), 1 (29 %), 2 (16 %), ≥ 3 (3 %)

Results 2: drugs before admission

Multivariate analysis

- significantly associated with :
 - history of recent falls [OR 2.7; 95%CI 1.6-4.7]
 - polymedication [OR 1.9; 1.1-3.5].
- Positive trend for association with diabetes, [OR 1.8; 0.98-3.4; $p=0.06$].
- No significant association was observed with any co-morbidity



Results 2 : IP according to STOPP drug classes

[prevalence /302patients] (**proportion /210 IP**):

- BZD [23 %] (0.33)
- Aspirine [11 %] (0.17)
- Opiates [8%] (0.11)
- B-blocker [6%] (0.09)
- Following: TCA's, Neuroleptics, Corticoids, NSAID [2-5%]
- Others [< 2 %] (<0.04)



Results 2 : IP according to STOPP

“drugs adversely affecting fallers”

- 176 of 302 patients (58%) received “drugs adversely affecting fallers”
- 112 of 210 IP events (53%) were “drugs adversely affecting fallers”
 - previous falls and benzodiazepines 70,
 - opiates 24,
 - neuroleptics 13,
 - antihistamines 5.



Results 3 : hospital admissions (n=302)

- **The most frequent main reasons for acute hospital admission were**
 - **Cardio-respiratory symptoms : 113**
 - **Falls : 104**
 - Abdominal reason : 38
 - Infection : 31
 - Other : 16



Results 3 : hospital admissions and IP events

- Hospital admission was related to IP in 54 patients (18%),
 - **47 falls** (46 fractures + 1 other)
 - 4 abdominal problem (constipation, hemorrhages)
 - 2 cardio-thoracic problem (NSAID+heart failure)
 - 1 other



Results 3 : hospital admissions and IP events

- 54 of the 302 hospital admissions related to IP

- Multivariate analyses :
 - predictors of IP-related admission
 - history of **previous falls** ($p < 0.001$)
 - nursing home residency ($p = 0.05$)



Results 3 : hospital admissions and “drugs adversely affecting fallers”

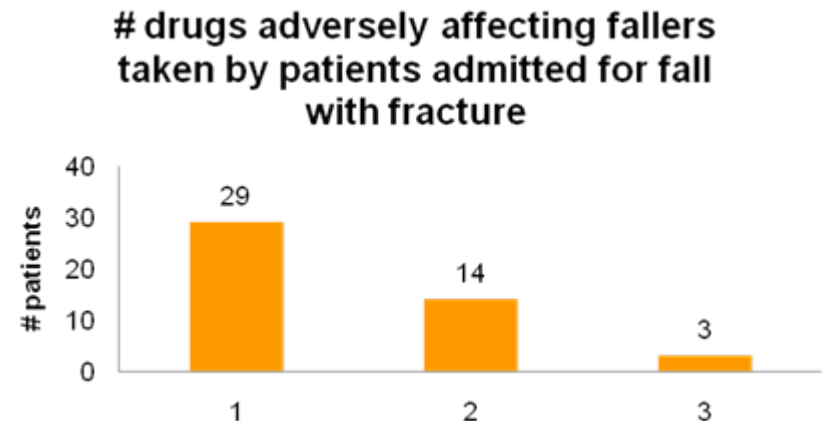
- **46** patients were admitted for fall with fracture while receiving “drugs adversely affecting fallers” despite history of recent fall.

- **66 IP events**

- BZDs : 38
- Opiates : 13
- Neuroleptics : 12
- Antihistamines : 3

- The use of “drugs adversely affecting fallers” was associated with IP-related hospital admission.

OR 5.2 [2.3-11.5] $p < 0.001$



Conclusions

1. IP in frail older persons at home according to STOPP
 - **1 prescription/10 ; 1 patient/2**
 - Most frequent ones : **BZD, Aspirine , Opiates , B-blocker**
 - 1 IP event /2 was **drugs adversely affecting fallers**
 - mainly benzodiazepines
 - which contributed 1/6 acute hospital admissions
 2. **1 acute hospital admission/5 was related to IP events**
 - Mainly for fall
- ⇒ *Screening for **fall history, benzodiazepine use and treatment modification** are of paramount importance in frail older persons.*

