Polypharmacy
from a clinical perspective

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OVERVIEW

The problem of polypharmacy in older adults

How to assess (potentially) inappropriate medications (PIMs)?

Focus on the aspects covered by PIMs lists

Evidence of association of potentially inappropriate medication with clinical outcomes

Evidence for the impact of remedial actions using PIM-lists

Take home messages
The problem of Polypharmacy in Older Adults
THE OLDER ADULTS (ELDERLY) AND MEDICATION

• In the developed world, 15 to 20% of the population is 65+ (and this percentage is growing).
• Among the population of 65+
  • Many of the healthy aging older adults take one or more chronic medication
  • Of the community-dwelling very old (80%) also more than half present polymorbidity and polypharmacy
  • Five to 8% reside in Nursing Homes (long-time care facilities LTCF)
    • In some countries these are home-replacing living, in other countries places to die
    • Up to 50% of the residents are cognitively impaired (and constitute half of the demented population)
    • Life expectancy is <1 to 4 years
    • Many of them have multiple chronic diseases
    • Most of them have polypharmacy (4 or more chronic medications with systemic action)
    • For 1 in 2 citizens, the end-of-life trajectory is going to a nursing home and die there,
A nation-wide appraisal of polypharmacy in Denmark

1.4 million Danish residents 60+ (mean 70Y, 53% women)

(Christensen et al., 2019, Eur J Clin Pharmcol)
Incidence of new drug treatments rate during transition from community-dwelling to nursing home

A cohort of 5,179 individuals (63% women; median age of 84y) admitted into 94 nursing homes across Denmark during 2015–2017.

Lindby et al., 2020, Age and Aging
Polypharmacy is just a number

What is the number?
the number of chronic medications (with systemic action)
taken by one patient at a given moment in time

What is polypharmacy?
5 or more chronic medications (with systemic action)
taken by one patient at a given moment in time

What is excessive polypharmacy?
10 or more chronic medication (with systemic action)
taken by one patient at a given moment in time
Some statements to consider

Not all polypharmacy is bad
  It might be perfectly appropriate for a patient with 4 chronic conditions to take 5 different medications

Not every patient with less than 5 medications is well treated
  It might be that a patient on 4 appropriate medications for 3 chronic conditions might have two more chronic conditions which are not treated as they should be

What counts is whether each chronic condition of the patient
  • is not left untreated (underuse)
  • and treated with appropriate medication (proper use) and not with inappropriate medication (misuse)

Most guidelines are directed to one clinical condition.
  If a patient with multimorbidity is treated by the book, the number of medications may be high and become a problem in itself.
Prevalence of Potentially inappropriate medication in community-dwelling older adults (80+)

Polypharmacy (58%)

Underuse (67%)

Misuse (56%)

31%

503 Belgian community dwelling 80+ (mean 84,4Y, 61,2% women)

Wauters et al., Brit J Clin Pharmacol, 2017
How to assess (potentially) inappropriate prescribing?
Two different approaches

1. By having clinical experts assessing the medical records and medication lists
   Medication Appropriateness Index
   (ten questions for each medication line)
   Using validated lists of explicit criteria:
   Beers’ list (US) ; STOPP-START list (EU)

   **Note:** This approach is time consuming, and
   expert resources might simply not be available

2. By combining multidisciplinary Medication Review
   with ICT assessment of (potentially) inappropriate medication (PIMs),
   assessed by explicit criteria
   Prima-EDS / OptiMeds / ....
Explicit criterion of (in)appropriate prescribing: a decision rule

IF

A specific disease is present (ICD or SNOMED code)
And /OR
A specific drug is present (ATC code and/or PHPID)

THEN

A specific inappropriate medication should be
stopped or reduced in dosage OR
A specific appropriate medication should be started

(BECAUSE)
there is evidence for this advice or
an expert panel said so
Validation of explicit criteria of Potentially (in)appropriate medication (PIM)

Mostly originated from expert panels using Delphi Methodology

Validated as lists of PIMs (not by individual PIM)

• In cross-sectional observational studies
• In Longitudinal observational studies
• In Randomised Clinical trials

Validity to assess the quality of pharmacotherapy of an individual patient remains
Selection of 650 explicit criteria from the 3 most important, validated, and current lists

Ivana et al., 2018, Geriatr Gerontol
Prerequisites for wide spread use of PIMs-lists

• **Availability of data** (reliable medication and clinical data)
  Access to the eMAR data (the nurse administration data)
  Access to Current Patient Summaries

• **Computerization** of PIMs

• **Interpretation in clinical context** of PIMs

• **Multidisciplinarity** (General Practitioner, community pharmacist, attending nurse)

• **Adequate ICT support** for communication of results between the multidisciplinary actors

• **Global identification of medicinal products** (UNICOM)
  Better application of decision rules, internationalization of CDS systems
Focus on the aspects covered by Potentially inappropriate medication lists
Focus on the aspects covered by Potentially Inappropriate medication Lists

- Underuse
- Obsolete drugs
- Dangerous drugs in the elderly
- Pharmacokinetic interactions
  (the addition of one drug leads to inactivity or toxicity of another drug)
- Pharmacodynamic interactions
  (two drugs reinforcing each others action or side-effect)
- Discontinuation of too long chronic therapy
  - Benzo’s, Antipsychotics, PPIs
  - Deprescribing near the end of life
    Statins, Calcium
- Compliance to complex guidelines in specific clinical conditions
Evidence of association of inappropriate medication with clinical outcomes
Evidence of association of inappropriate medication with clinical outcomes

- Mortality
- (Drug-related) unplanned hospitalisations
- Reduction of Quality of life
- Cognitive impairment
- Lack of alertness
- Falls
- Cost of health care
- ...
Evidence for the impact of remedial actions
Using PIM-lists
Methods of measuring impact

- With experts in research setting
  using clinical insight and implicit criteria
  using explicit criteria

- With computer generated PIMs evaluation in research setting

  Based on medication data only (scratch the surface)
  Based on medication data and on (reliable) clinical data

- With computer generated PIMs evaluation on Real World Data

Differences in method have an Impact on:

  estimates of prevalence of the problem
  estimates of effect size
  cost of the evaluation and cost benefit of the interventions
Results of outcome studies

OBSERVATIONAL STUDIES
  Many studies showing impact on process indicators
    Reduction of the mean number of PIMs per patient
  Some studies show association with
    mortality and hospitalisation
  Most studies show no association with on falls (multicausality)

RANDOMIZED CLINICAL TRIALS
  Many studies showing impact on process indicators
    Reduction of the mean number of PIMs per patient
  A few studies show association with
    mortality and hospitalisation
  Most studies fail to show association with quality of life

NOTE:
  ICT support, Multidisciplinary cooperation (General Practitioner, pharmacist, nurse, geriatrician) is important
  Change in organisational culture in health care services take time, and sufficient time frame is needed to evaluate outcome
Take home messages
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- Complex morbidity patterns and polypharmacy are the fate of many older adults, whether residing in nursing homes or community-dwelling.

- These are vulnerable patients, often with insufficient clinical documentation

- A current Patient Summary with a reliable medication list is enough to unleash the power of ICT supported medication review.

- Good clinical data and ICT-Support will increase the efficiency of medication review, prevent alert fatigue, and facilitate interprofessional cooperation.

- Better quality of prescribing could make this vulnerable population more resilient to pandemics and may reduce pharmacodynamic interactions with impact on Quality of Life. The latter statement needs more evidence.
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7. Rapid Response: Vander Stichele RH, Elseviers M, Christiaens T, Wauters M, Kalra D. **Quality of prescribing to vulnerable nursing home residents: time to act.** Rapid response to: Use of an electronic decision support tool to reduce polypharmacy in elderly people with chronic diseases: cluster randomised controlled trial. BMJ 2020; 369 doi: [https://doi.org/10.1136/bmj.m1822](https://doi.org/10.1136/bmj.m1822) (Published 18 June 20)


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