Prescribing cascades in older Irish adults: analysis of a national dispensed medication database

Summary of findings from a research study:

Prescribing cascades in older community dwelling adults: application of prescription symmetry sequence analysis to a national database in Ireland

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Background

This research is part of a 5-year programme of research funded by the Health Research Board focusing on medication safety and quality in older people attending general practice.

Older adults are more likely to live with several long-term health conditions that require multiple medications. The use of multiple medications is frequently necessary and there are pros and cons that need to be balanced, especially in older adults. But it can become so complex that there are often risk-benefit trade-offs. This can result in medication side effects and prescribing cascades.

Prescribing cascades = when a new medication is prescribed to treat/prevent a side effect caused by another medication.

Prescribing cascades can be intentional or unintentional.

Example of intentional prescribing cascade = prescribing anti-sickness medicine to prevent/treat vomiting due to chemotherapy.

Unintentional prescribing cascade = when a side effect is misinterpreted as a new problem, which results in prescribing a new (second) medication.

Example of an unintentional prescribing cascade = a patient with ankle swelling due to a side effect from high blood pressure medication is prescribed a diuretic as the swelling is misdiagnosed as a symptom of heart failure.

When this happens, the patient continues to be exposed to medication-related harm from the first medication, which is worsened by the additional risk from the second medication.

Not recognizing a medication side effect may be more likely to occur in older adults as there are typically several potential culprit medications, multiple underlying medical conditions and side effect symptoms can be vague with many possibles causes. This makes the process of identifying a prescribing cascade very challenging.

Why our study is needed

Recently, an international group of experts from different areas (e.g. general practitioners, geriatricians, pharmacists etc.) put together a list of nine clinically important prescribing cascades specifically focused on older adults, called ThinkCascades.

These nine prescribing cascades were selected from a list of possible cascades identified by literature review and group discussion. So far, no studies have examined how common these nine prescribing cascades occur in a national sample of older adults.

What we did

Our study describes how common (the prevalence) of ThinkCascades in older community-dwelling adults (aged 65 years or older) living in Ireland and explores potential differences with age, sex and individual medication. Data from a national Health Services Executive database of prescriptions dispensed was examined. We analysed data for prescriptions on the General Medical Services (GMS) scheme**,** commonly known as the Medical Card scheme, during the years 2017 to 2020. This scheme is means tested and covers more than 60% of adults aged 65 years or older and approximately 80% of those aged 75 years or older in Ireland. There were over 46 million prescriptions (for at least one of the relevant medications) in over 533,000 older adults. We analysed nine examples of prescribing cascades involving medicines commonly prescribed in general practice.

What we found

Overall, we identified four potential prescribing cascades, that ranged in prevalence from 0.4-3% over a one year follow up period.

These were:

1. Calcium channel blockers (blood pressure medicine) leading to diuretics (water tablet)
2. benzodiazepines leading to antipsychotics (used to treat psychosis)
3. selective serotonin reuptake inhibitors (SSRI) or selective noradrenaline reuptake inhibitors (SNRI) (used to treat depression and anxiety disorders) leading to sleep medications
4. alpha blockers (to treat prostate conditions) to anti-dizziness tablets

Three of the medicine pairs identified a potential cascade in the opposite direction. However, this may indicate prescriber awareness of these of prescribing cascades.

These were:

1. diuretics (water tablets) to overactive bladder medication
2. benzodiazepines to anti-dementia agent (used to treat dementia)
3. non-steroidal anti-inflammatory drugs to blood pressure medication

We also found that in some cases the likelihood of a prescribing cascade differed depending on age, sex and the medication involved.

What this means

This study identified several potential prescribing cascades where medications are prescribed to treat the side effects of another medication. This may offer opportunities for doctors and pharmacists when reviewing patient medications to stop medications that may no longer be required. It is important to note that this study examined prescription data only. There may be alternative explanations as to why patients are prescribed these medications such as undiagnosed health conditions or untreated symptoms already present before the first medication was started.

Several examples of prescribing cascades were not identified in this study which may indicate prescriber awareness of these medications side effects.

What this changes

Older adults are more likely to live with several long-term health conditions that require multiple medications. Our previous research has indicated that older people taking 10 or more long term medications are much more likely to experience medication related harm.

Most guidelines only consider single diseases and not how to combine prescribing for multiple conditions, making this a significant challenge for clinicians. Therefore, increasing awareness of medication side-effects in patients presenting with new symptoms is an important step in identifying and reducing the risk of prescribing cascades. Furthermore, reducing prescribing cascades could decrease the number of medications the patient needs to take and potential harm.

Future research with access to patient health record data (e.g. long-term health conditions, reasons for prescriptions) or patient interview is required to examine in more detail why prescribing cascades occur and their impact on medication-related harm.

How to find out more

Visit our Department of General Practice Research Webpage here

Three other published articles as part of this project can be found at:

- Prescribing cascades in community-dwelling adults: A systematic review - October 2022.
- Adverse drug reactions and associated patient characteristics in older community-dwelling adults: a 6-year prospective cohort study - March 2023
- Stakeholder perceptions of and attitudes towards problematic polypharmacy and prescribing cascades: a qualitative study – June 2024.

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