

Pilling Me Softly:

A Case Study of the Risks of Polypharmacy in the Elderly

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Learning points

- Polypharmacy is still an ongoing issue throughout medicine despite attempts to reduce it
- Polypharmacy poses a significant problem to geriatric populations, with an increased risk of adverse drug events, interactions and risk of falls and cognitive impairment
- To address polypharmacy, evidence-based prescribing and deprescribing is an essential approach using tools such as STOPP/START criteria

Introduction

Census data has revealed that the number of people over the age of 65 in the UK is now over 11 million, representing a 20% increase in a decade. (1) With 18.6% of our patient base now being classified as a geriatric population, it has never been more vital for us to understand the common issues facing geriatric patients.

Recent research has demonstrated that 54% of geriatric patients have at least two medical conditions, which is expected to increase to almost 70% in the next twenty years. Furthermore, the research revealed that 90% of people over 85 were living with multimorbidity. (2)

As the number of comorbidities increases, so does the number of prescriptions administered to manage them. Polypharmacy as the co-prescription and administration of more than five medications at one time, which is reported in 22.8% of geriatric patients in the UK. (3)

The risk of polypharmacy in elderly patients is higher than in the general population due to differences in pharmacokinetics, number of comorbidities, and susceptibility to adverse drug events. ADEs have been associated with 11% of all visits to the hospital, with 70% of these visits being comprised of geriatric patients with polypharmacy. (4)

It is vital that both current and future healthcare professionals have a foundational understanding of the nature of polypharmacy and methods to reduce it, as well as the impact on the patient if this issue is left unmanaged. As such, I present the case of an 83-year-old gentleman who presented to A&E with a fall.

Case study

Mr X described that he fell after getting out of bed to go and get a drink. He described feeling dizzy after he stood up and collapsed, but he did not lose consciousness. He was found on the floor by his son, who had come to visit him, about three hours after the fall occurred. The patient complained of moderate pain in his left hip, reported as 7 out of 10 on the pain scale, as well as mild pain in his left shoulder and wrist. He reported no loss of consciousness and hadn't hit his head, although he was mildly disoriented to time.

Upon questioning, he reported feeling increasingly unsteady over several weeks, and his son reported that Mr X had been increasingly forgetful over a similar time frame.

The patient had a past medical history of hypertension, type II diabetes, benign prostatic hyperplasia, hyperlipidaemia and migraines. He was taking several medications for this, including:

- Tamsulosin 400mcg OD
- Lisinopril 10mg OD
- Amlodipine 10mg OD
- Metoprolol 100mg BD
- Metformin 500mg BD
- Omeprazole 20mg OD
- Atorvastatin 10mg OD
- Amitriptyline 25mg OD
- Sumatriptan 50mg PRN
- Ranitidine 150mg BD

Mr X reported he had been taking all of these regularly and hadn't missed any doses, as he uses a dosette box, which his son confirmed. Mr X said that he wasn't experiencing any side effects of his medication as far as he knew. He reported he had recently started amitriptyline as prophylaxis for migraines a few weeks ago, which coincided with the onset of his symptoms.

The patient appeared frail on examination and had mild difficulty maintaining balance when standing. His left hip was tender and had limited range of motion, particularly in abduction. Neurological examination revealed no deficits, and his mini-mental status examination score was reduced at 22.

An x-ray revealed no fractures of the hip, and the pain was likely due to soft tissue injury. Therefore, the majority of Mr X's management was focused on reducing the burden of polypharmacy. He was prescribed paracetamol for the pain, and his amitriptyline, metoprolol, omeprazole, sumatriptan, and ranitidine were all stopped. He remained in the hospital for a few days until his confusion resolved, and was discharged home.

Discussion

Despite improvements in medical education and healthcare professional awareness of polypharmacy, rates of polypharmacy are still increasing, according to recent studies. Over the course of a decade, recent research demonstrated that the percentage of the population with polypharmacy increased from 6.3% to 10.7%. (5) Analysis of Scottish data revealed that 20.8% of adults were prescribed more than 5 medications, and 5.8% were prescribed more than 10 medications – both significant increases over a 15-year period. (6)

What is the problem with a patient being prescribed multiple medications?

Medications are prescribed to help patients and solve a problem, whether to treat a disease, a symptom or prevent an adverse outcome. In Mr X's case, he was prescribed

medication to manage his BPH, hypertension, diabetes, indigestion, hyperlipidaemia and migraines. However, several problems arise from polypharmacy.

One issue is what is known as a prescribing cascade. This is an issue that both arises from and contributes to polypharmacy. The prescribing cascade describes a situation in which a patient is prescribed a new medication that results in an adverse symptom, that a prescriber then manages with a new medication, with its own side effect profile. (7) This can lead to increasing numbers of medications being prescribed to manage the side effects of medications. In Mr X's case, he had been prescribed omeprazole and ranitidine to treat symptoms of indigestion that arose from taking metformin. In contrast, a change to a modified-release form of metformin may have improved the side effects without the need for further prescriptions, as shown in Figure 1.

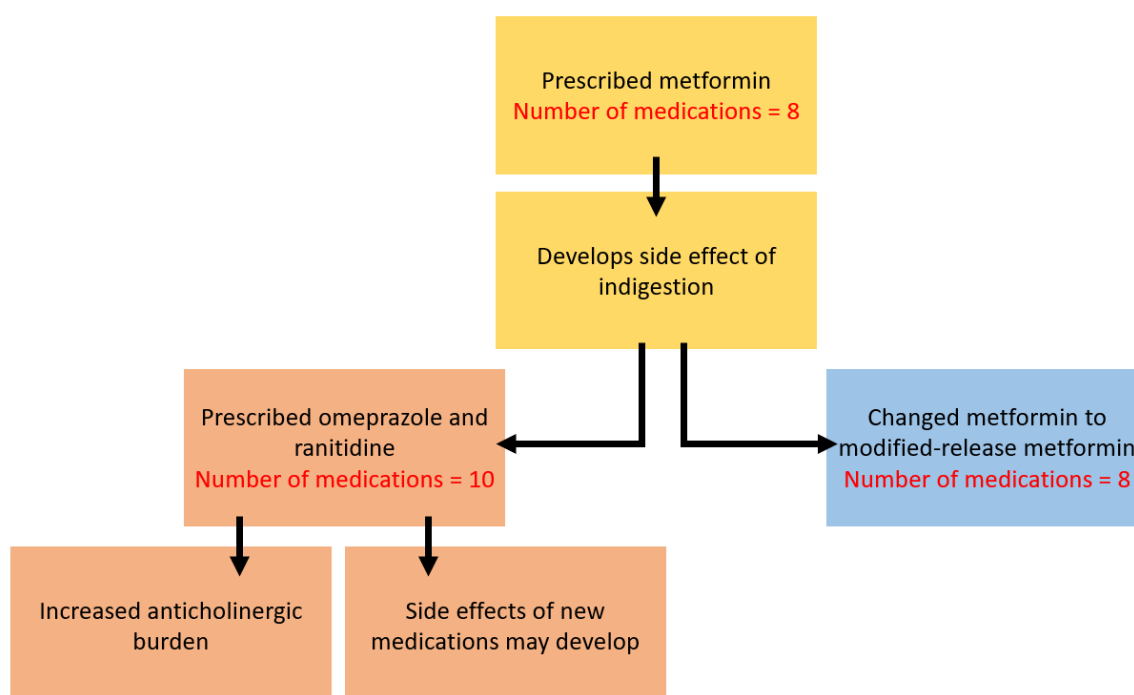


Figure 1 – Flowchart demonstrating potential outcomes in Mr X's case. In orange on the left hand side shows the progression of the prescribing cascade, with more medications prescribed to treat side effects that result in side effects of their own. In blue on the right hand side shows a method of managing the problem without increasing Mr X's medication burden.

This increased medication burden poses several risks to the patient, particularly in the geriatric population. With increased co-prescription, there is an increased risk of interactions between medications and adverse events. This is particularly important in Mr X's case as it contributed to his presentation to the hospital. Mr X was on several medications that increased his anticholinergic burden. These medications have anticholinergic side effects and may contribute to the development of anticholinergic syndrome, impaired cognition and increased falls within the geriatric population. (8) Mr X was taking metoprolol, amitriptyline and ranitidine, which amounts to an Anticholinergic Burden Scale score of 5. The recommendation is that a score of 3 or more is clinically relevant, as there is reported to be a significant association with adverse events, including fractures, delirium and emergency department admissions, compared to those with no anticholinergic burden. (9) Although medications with anticholinergic side effects are not recommended in those over 65, recent research has demonstrated that at least

one anticholinergic medication is present in 12.5% of geriatric patients, with ranitidine being the third most commonly prescribed medication. (8)

How can polypharmacy be addressed?

Several approaches to reducing polypharmacy have been suggested, ranging from interventional to preventative approaches.

At its core, improved care for patients starts with the education of the healthcare professional. Research has demonstrated that specific and tailored polypharmacy workshops aimed at medical students and pharmacy students result in a significant increase in self-reported understanding, as well as increased recognition of drug errors and interactions in case studies (10). Further education of the whole multidisciplinary team at a training level is vital in preventing inappropriate prescribing and overprescribing at a population level, but more specifically in the more at-risk geriatric population.

Educating healthcare professionals is not entirely centred on how much information they can recall at once. With an increasing number of medications on the market with regularly updated healthcare guidance, remembering all medications to avoid in geriatric patients, de prescribe and use with caution in the elderly population is a near impossible task. It is therefore essential to equip current and future healthcare professionals with the understanding of where to find this information and which tools are the most appropriate.

The aptly named STOPP/START criteria are evidence-based recommendations for healthcare professionals to use in patients over the age of 65 with multiple comorbidities and polypharmacy (11). The criteria give explicit situations in which a medication should be considered or de prescribed alongside the rationale for each recommendation. Recent large-scale trials have revealed that when the STOPP/START criteria are implemented within hospitals, 73.6% of the recommendations were clinically relevant and more likely to reduce adverse outcomes. It is important to note that the care for the patient is still individualised, and not all recommendations were followed in each case. This study also demonstrated that clinically relevant recommendations were significantly more likely to be implemented by healthcare professionals than those of lower clinical relevance (12). Furthermore, a recent systematic review revealed that the use of the STOPP criteria results in significant reductions in inappropriately prescribed medicines and improved economic outcomes (13). Tools such as the STOPP/START criteria provide healthcare professionals with a tool to appropriately manage medications in elderly patients whilst still giving the freedom of individualised patient care.

What is next for polypharmacy?

The next steps in the management of polypharmacy require more research and improved healthcare professional and patient education.

Future research should compare different de prescribing tools to establish which is the most efficient at reducing adverse outcomes. I recommend future researchers consider carrying out a multi-centre trial comparing the rates of adverse outcomes in geriatric patients managed using the STOPP/START criteria, Beers Criteria, ARMOR and de prescribing.org. This would aid in identifying the most effective criteria for reducing

polypharmacy and improving patient outcomes, which is always at the crux of healthcare research.

Furthermore, future education should focus on consistent polypharmacy education throughout medicine, nursing and pharmacy courses to improve awareness at a systematic level. It is not enough to just increase the understanding of future healthcare professionals, but also improve the understanding of current professionals. This can be achieved using resources such as the Health Education England platform, such as their recent course 'Genomics 101', which aims to improve genomic literacy in healthcare professionals as genomics becomes increasingly important. Likewise, as polypharmacy is an increasing issue with an ageing population, it is also increasingly important to supplement practising healthcare professionals' understanding with learning resources.

Lastly, it is crucial not to forget the role of the patient in their own care. Continued patient education is necessary to allow patients to have authority in their own care, understand their medications and what they are used for, and when to raise something with a healthcare professional. Recent research has demonstrated that videos are effective in improving patient understanding of key concepts of their medication, (14) and this can be applied in the geriatric population as well to improve health literacy. Specific areas to improve patient understanding could include the side effects of their medications, monitoring their use of over-the-counter medications, and what polypharmacy is.

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