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ORIGINAL RESEARCH

Potentially Inappropriate Medications in a Psychogeriatric Inpatient Ward: An Audit Based on Beers Criteria

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ABSTRACT

Introduction: Older adults are often prescribed a high number of medications. Overcoming inaction in health care is difficult but essential to deprescribing potentially inappropriate medications (PIMs). Curbing the use of PIMs is urgent in older adults suffering from psychiatric illness, as cognitive, emotional and psychosocial adversity makes them an especially vulnerable group. We aimed to audit PIM usage and deprescribing in an old-age psychiatry inpatient service of a university-affiliated public hospital.
Methods: The 2015 American Geriatrics Society (AGS) Beers Criteria were used in the present study. Computerized medical records were reviewed for all patients discharged from the Dunedin Public Hospital Inpatient Psychogeriatric Ward during the period January 2017 to December 2017.

Results: During the 1-year study period, 136 patients were discharged from our psychogeriatrics inpatient ward, including 87 women and 49 men, with a mean age of 75.4 ± 8.6 years (range: 59–95). The mean number of medications prescribed per patient at the time of admission was 7.7. At discharge, a mean of 8.9 medications were recorded. Analysis focused on 120 complete patient records. Of the 49 patients with 63 high-risk medications, 16 patients (prescribed 19 high-risk medications) had their high-risk medication stopped, 23 patients (prescribed 24 high-risk medications) had high-risk medications started and 10 (prescribed 20 high-risk medications) had no change to high-risk medications between admission and discharge. In 56 of 120 patients (47%), benzodiazepines (BZDs) were started, stopped or unchanged.
Conclusion: Older adults suffering from severe psychiatric disorders are frequently prescribed PIMs. However, clinical decision-making for this vulnerable population needs to take into account safety as reflected by the Beers Criteria, but also the complexity of managing psychogeriatric problems.

Keywords: Beers Criteria; Benzodiazepines; Psychogeriatrics

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Key Summary Points

Why Carry out this Study?

Older adults, especially those treated for comorbid psychiatric conditions, are often prescribed a high number of medications.

We assessed the deprescribing of medications in a psychogeriatric ward as a measure of safety.

What was Learned from the Study?

At discharge, a large proportion of patients still had potentially inappropriate medications prescribed.

We call for further efforts to increase safety by appropriate deprescribing of psychotropics.

INTRODUCTION

Potentially unsafe prescriptions at the time of discharge are common for older patients from both general hospitals and psychiatric institutions. Prescribing of potentially inappropriate medication (PIM) can lead to readmissions and increased morbidity and mortality [1]. Many clinicians pay close attention to the medications they prescribe to older adults, but there is a lack of a standardized process to reduce the risk of overprescribing and underprescribing. Most physicians use their clinical judgment, rather than strict criteria alone, to prescribe or discontinue medication treatment. The American Geriatric Society developed the Beers Criteria for PIM use in older adults. Since 2012, the Beers Criteria have been updated regularly, with an update in 2015, and the most recent draft for updated criteria made publicly available in 2018 [2]. The Beers Criteria also show higher levels of capturing PIMs in older adults when compared with other available criteria [3]. The Beers Criteria are helpful and can be used for older adults; however, they may not apply well to all patients.

Patients in old-age psychiatry inpatient wards are often prescribed medications that belong to several groups of PIMs listed in the Beers Criteria, in particular anticholinergic medication including first-generation antipsychotics. Lee and colleagues [4] retrospectively assessed the anticholinergic burden of medications amongst patients discharged from a psychiatry old-age ward by using a standardized scale for quantifying anticholinergic burden. The number of patients who had at least one anticholinergic medication had significantly increased at discharge, and only 10% of the discharged patients had not been prescribed anticholinergic medications. Older adults with cognitive impairment are particularly vulnerable to the effects of PIMs, and cognitive impairment was significantly associated with prescriptions of PIMs, further emphasizing the severity of Lee's findings in a recent study [5].

Surprisingly, it is uncertain whether pharmaceutical care reduces the number of PIMs or the proportion of patients with one or more PIMs. In a systematic review and meta-analysis of pharmacists' interventions in secondary care aimed at improving the appropriateness of prescribing in older patients, a total of 1752 records were found. The analysis showed that interventions may improve prescribing appropriateness in older inpatients, though the clinical significance of observed reductions is unclear [6]. The Cochrane Database of Systematic Reviews network recently assessed interventions to improve the appropriate use of polypharmacy for older people [7]. The authors identified 32 studies. Interventions were provided in a variety of settings and delivered by healthcare professionals including general physicians, pharmacists and geriatricians. The authors concluded that it is unclear whether interventions to improve appropriate polypharmacy, such as reviews of patients' prescriptions, resulted in clinically significant improvement.

More research is needed on the effectiveness of interventions in reducing PIMs in older psychiatric patients [8]. The aim of the present study was to describe use of PIMs in an old-age

psychiatry inpatient service, as these patients are more vulnerable to polypharmacy.

METHOD

PIMs Criteria

The 2015 American Geriatrics Society (AGS) Beers Criteria include lists of PIMs to be avoided in older adults. New to the criteria are lists of selected drugs that should be avoided or have their dose adjusted based on the individual's kidney function and selected drug–drug interactions reported to be associated with harms in older adults. The 2015 AGS Beers Criteria are applicable to all older adults with the exclusion of those in palliative and hospice care [2]. We used the Beers Criteria in the present study, modified to reflect the recommendations for alternative medication options in the use of high-risk medications in older adults as published by the US National Committee for Quality Assurance and the Pharmacy Quality Alliance [9].

The modified Beers Criteria we used do not include second-generation antipsychotics, benzodiazepines, peripheral alpha blockers or non-steroidal anti-inflammatory agents, as these are not defined as high-risk medications in older adults [9] and are frequently used by psychogeriatricians.

Participants

Computerized medical records of all patients discharged from the Dunedin Public Hospital Inpatient Psychogeriatric Ward during the period January 2017 to December 2017 were reviewed. A clinical pharmacist highlighted the medications from the high-risk medications that are available in New Zealand. Medications available in New Zealand are restricted by the Pharmaceutical Management Agency, better known as Pharmac. This is a New Zealand Crown entity that determines, on behalf of district health boards, which medicines and pharmaceutical products are subsidised for use in the community and public hospitals. The list of high-risk medications contained many medications that are not available in New Zealand. Of the 60 high-risk medications listed, only 25 medications or their generic equivalents were available in New Zealand.

For every patient, we recorded the number of medications they were receiving prior to admission to the psychogeriatric ward and the number of medications upon discharge. In addition, we recorded the overall number of high-risk medications and their specific chemical class. High-risk medications that were discontinued during inpatient stay and the high-risk medications that were started during the patients' admission were also recorded.

Ethics

This study was performed in accordance with the Helsinki Declaration of 1964 and its later amendments. Consent for publication was given by the relevant ethics committee. Ethical approval for this audit was obtained from the University of Otago Ethics Committee, the Department of Psychological Medicine Ethics Committee and the Southern District Health Board (SDHB) ethics committee. The Human Ethics Committee's reference number for this study is HD18/103.

RESULTS

During the 1-year study period 136 patients were discharged alive from the Mental Health Services for Older People Inpatient Ward at Dunedin Public Hospital, Dunedin, New Zealand.

These included 87 women and 49 men, with a mean age of 75.4 ± 8.6 years (range: 59–95).

Missing Data

Of the 136 patients admitted to and discharged from the mental health ward, 27 had died at the time of completion of the data collection. This affected our ability to calculate the number of medications that 16/27 deceased patients were prescribed, as we were unable to obtain the

complete admission or discharge medications due to computerized shutdown of their medication charts.

We thus obtained the number of admission and discharge medications for 120 patients. A total of 923 admission medications were recorded, with a mean of 7.7 medications for each patient admitted. At discharge, a total of 1071 medications were recorded, with a mean of 8.9 medications for each patient discharged.

PIMs

Amongst 120 patients, 49 patients (41%) had been exposed to high-risk medications. Those 49 patients had a total of 63 high-risk medications unchanged, started or stopped. Most patients were on only one high-risk medication, and some had two and at most three high-risk medications.

Of the 49 patients with 63 high-risk medications, 16 patients (prescribed 19 high-risk medications) had their high-risk medication stopped, 23 patients (prescribed 24 high-risk medications) had high-risk medications started and 10 (prescribed 20 high-risk medications) had no change to high-risk medications between admission and discharge.

The high-risk medications that were stopped, started or unchanged during inpatient stay could be divided into three groups. The most frequent of the 19 high-risk medications that were stopped were anticholinergic medications (nortriptyline, amitriptyline, doxepin, benztropine, solifenacin and oxybutynin), followed by zopiclone and first-generation antipsychotics (phenelzine, levomepromazine, zuclopenthixol and amisulpride). Of the 24 high-risk medications started during admission, eight were anticholinergic medications (doxepin, amitriptyline, oxybutynin and benztropine), eight were first-generation antipsychotics (levomepromazine, droperidol and amisulpride), seven were zopiclone, and one nitrofurantoin. Of the 20 medications unchanged during inpatient admission, the great majority (15 patients) was continuation of unchanged zopiclone prescribing. In addition, two anticholinergic medications (oxybutynin and benztropine) and two first-generation antipsychotics (flupenthixol and levomepromazine) were unchanged, and one patient was treated with nitrofurantoin.

Benzodiazepines

We analysed patient records for those who had been prescribed benzodiazepines (BZDs) in the community prior to admission, as well as those who were prescribed BZDs during their inpatient stay. There were 56 of 120 patients (47%) for whom BZDs were started, stopped or unchanged during inpatient stay. In almost half of those patients (26/56; 46%), BZDs prescribed in the community were unchanged during their inpatient stay. In one third of patients, BZD treatment was started during their inpatient stay, and in nine patients (16%) BZDs were stopped. In three patients BZDs were switched from one brand to a different brand.

Diagnoses

The most common diagnosis at discharge was dementia (69/136; 50.7%); 43 patients (31.6%) were diagnosed as suffering from a mood disorder (11 patients with bipolar affective disorder); 16 patients (11.8%) were diagnosed as suffering from a psychotic disorder (12 patients with schizophrenia); four patients were diagnosed as suffering from an anxiety disorder, two patients from personality disorder, one patient from adjustment disorder and one patient from alcohol dependence.

Comorbid diagnoses were not uncommon, and were observed as follows: delirium in ten patients, alcohol abuse in six patients, anxiety in five patients and personality disorder in two patients.

Patients with a diagnosis of dementia had been prescribed a total of ten anticholinergic medications; five started during admission (levomepromazine, doxepin) and five discontinued on admission (nortriptyline, oxybutynin, levomepromazine). However, no patient suffering from dementia was discharged with an anticholinergic medication.

Seven patients with other psychiatric diagnoses were prescribed anticholinergic medications prior to admission (doxepin, nortriptyline, amitriptyline, oxybutynin and benztropine), and most of these were discontinued. In six patients, anticholinergic medications were started during inpatient stay (doxepin, benztropine, oxybutynin and amitriptyline).

DISCUSSION

Inertia is a powerful factor in the failure to stop or to starting potentially harmful medications in health care. Potentially damaging medications are often not stopped even years after they have been started. It takes time to reassess use of medications prescribed to patients with chronic diseases, particularly therapies that are not clearly related to the symptoms or conditions that are the focus of a given inpatient admission. Clinicians also may be unsure about how to best taper different medications or how to recognize and manage adverse drug withdrawal events. Thus, the use of unnecessary and potentially harmful medications is common among older adults [10]. A recent nested case–control study demonstrated that commonly prescribed drugs for bladder conditions, Parkinson's disease symptoms and psychiatric illnesses are tied to a higher risk for dementia. If the association between anticholinergics and dementia proves to be causal, around 10% of dementia diagnoses could be attributable to anticholinergic drug exposure [11].

Interventions that require substantial effort by pharmacists or physicians are often highly effective for deprescribing medications but are challenging to implement in the "real world" due to the time, effort and cost required [12]. Most frequently it is incumbent upon physicians to strive for change in prescribing practices. Engaging only physicians neglects the critical role of patient buy-in to make change happen. Change, or overcoming inertia in health care, is difficult but essential to deprescribing harmful medications. Involving groups that are less often the target of interventions, such as patients, in order to overcome inertia will likely be necessary for medicine to achieve such changes.

In the present study, a "real-world" audit focused on a particularly vulnerable group of older patients—those admitted to tertiary psychogeriatric care. Similar to reports by other groups assessing medications on discharge of older patients from hospital, the mean number of medications per patient was close to nine [1]. In this study, the authors also reported that prescription of more than five medications was associated with PIMs. In addition, while a recent study focusing on anticholinergic burden in older patients [4] demonstrated that at the time of discharge, the proportion of patients on at least one anticholinergic medication had increased, in our audit, a third of anticholinergic medications were discontinued, and no patient suffering from dementia was discharged with an anticholinergic medication. The paucity of published research in older psychiatric patients makes it difficult to compare the present audit's findings with other projects. Rongen [13] and colleagues attempted to determine the prevalence of PIMs in older people with major psychiatric illness. A total of 1269 drugs were prescribed to the study's 169 patients, and PIMs were identified in 47% of participants, based on the 2012 Beers Criteria. Most PIMs (70%) concerned psychotropic drugs. The authors concluded that "… the focus on psychotropic drugs prescription without taking into account the benefit of these drugs to individual patients may limit the application of the Beers criteria in psychiatric hospitals."

The present study has several limitations that need to be acknowledged. First, the American Geriatrics Society (AGS) Beers Criteria® for Potentially Inappropriate Medication (PIM) Use in Older Adults are widely used by clinicians, educators, researchers, healthcare administrators and regulators. Since 2011, the AGS has been the steward of the criteria and has produced updates on a 3-year cycle. The AGS Beers Criteria® is an explicit list of PIMs that are typically best avoided by older adults in most circumstances or under specific situations such as in certain diseases or conditions. For the 2019 update, an interdisciplinary expert panel reviewed the evidence published since the last

update (2015) to determine whether new criteria should be added and whether existing criteria should be removed or undergo changes to their recommendation, rationale, level of evidence or strength of recommendation [14].

We tentatively conclude that awareness of PIMs prescribed for patients suffering from dementia is relatively high in our psychogeriatric inpatient service. Popularising the use of the Beers Criteria in psychogeriatric services is called for. Amongst older adults with psychiatric disorders, PIMs use is frequent and needs to be considered taking into account both safety, as reflected by the Beers Criteria, and the complexity of managing psychogeriatric problems.

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Compliance with Ethics Guidelines. This study was performed in accordance with the Helsinki Declaration of 1964 and its later amendments. Consent for publication was given by the relevant ethics committee. Ethical approval for this audit was obtained from the University of Otago Ethics Committee, the Department of Psychological Medicine Ethics Committee and the Southern District Health Board (SDHB) ethics committee. The Human Ethics Committee's reference number for this study is HD18/103.

Data Availability. The data sets analysed during the current study are available from the corresponding author on reasonable request.

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