European Geriatric Medicine 7 (2016) 40–46

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Research paper

Examining potentially inappropriate prescribing in residential care using the STOPP/START criteria

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ARTICLE INFO

Article history:
Received 24 September 2015
Accepted 9 November 2015
Available online 4 December 2015

Keywords:
STOPP/START
Inappropriate prescribing
Residential care
Older people

ABSTRACT

Introduction: Inappropriate prescribing in residential care is a particular health concern. This study aims to identify the prevalence of potentially inappropriate prescriptions (PIP) and potential prescribing omissions (PPO) in older people living in residential care in New Zealand.
Method: The STOPP/START criteria was applied to the data collected from the medical notes of people aged ≥ 65 years-old living in two residential care homes in New Zealand. Prescribed medicines were classified using the World Health Organisation Anatomic Therapeutic Classification. Charlson Comorbidity Index and Katz Activities of Daily Living were computed for each resident and included in the regression analyses.
Results: The mean age of residents (n = 137) was 85.4 (± 7.7) years. In total, 205 PIPs among 102 residents (74.5%) were identified and 66 PPOs were present among 49 residents (35.8%). Antipsychotics were the most common PIPs in residents with a medium/high falls risk (18.6%). Residents with higher comorbidity scores were less likely to be taking a PIP. Residents with a medium/high falls risk were more likely to have a PIP, than those with a low falls risk.
Conclusion: Consistent with other countries, PIPs and PPOs were highly prevalent in older people in residential care in New Zealand. Antipsychotics, opiates and benzodiazepines accounted for approximately 50% of the 205 PIP exposures. Regarding PPO, the omission of aspirin and angiotensin converting enzyme inhibitors where clinically indicated was noted. The STOPP/START criteria could be used in multidisciplinary clinical reviews to help improve the medicine therapy in older people living in the residential care setting.

1. Introduction

Polypharmacy is a common occurrence in older people with multi-morbidity and leads to adverse outcomes [1]. Optimal prescribing, with minimal polypharmacy, can be hard to achieve in older people because of multiple medical conditions, ageing associated physiological changes or enhanced responses to specific medicines [2]. In addition, inter-individual variability in health, frailty and disability increases with ageing [3]. These factors cumulatively influence how older people respond to different medicines, making the process of medicine selection challenging.

In recent years, potentially inappropriate prescribing has been studied in primary care, hospitals and residential care. A medicine is deemed to be potentially inappropriate, if the risks of an adverse drug outcome outweighs the intended clinical benefit, or is prescribed at an excessive dose or for a longer duration [4]. On the other hand, omitting medicines, which could provide benefit to patients is considered as another important aspect of inappropriate prescribing.

Inappropriate prescribing is a particular concern in older people living in residential care because they tend to be frailer, experience a greater number of chronic illnesses, take more medicines and are at a greater risk of experiencing an adverse drug outcome. One study found that, over a four-year period, two-thirds of rest home residents experienced adverse drug reactions (ADRs). One in seven of these resulted in hospitalisation [5]. Implicit and explicit tools developed have been widely applied across different healthcare systems to screen for inappropriate prescribing in older people [6]. However, only a few of these criteria, address both aspects of prescribing i.e. omitting medicines as well as prescribing inappropriate medicines.

The Screening Tool of Older Person's Prescriptions (STOPP) and START (Screening Tool to alert doctors to Right Treatment) are explicit criteria developed by researchers in the Republic of Ireland that examine both under-prescribing and inappropriate prescribing

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http://dx.doi.org/10.1016/j.eurger.2015.11.004
1878-7649/

[6]. The criteria has shown good inter-rater reliability when applied by physicians and pharmacists to patient profiles [7] and have been used to examine the appropriateness of prescribing in residential care [8–11] and other settings. A recent study conducted in an Australian teaching hospital found that more than half of the participants had at least one instance of Potential Inappropriate Prescribing (PIP) using the STOPP/START criteria [12]. To our knowledge, there is a lack of research on the prevalence of PIPs and Potential Prescribing Omissions (PPOs) in the residential care setting in New Zealand.

This study therefore aimed to determine the prevalence of PIP and PPO in two residential care homes in New Zealand, using the STOPP/START criteria.

2. Methods

Ethics Committee approval was obtained from the University of Otago, Human Ethics Committee, (Ethical approval number: 13/018). Permission to screen prescribing in two residential care homes in New Zealand was obtained from a residential care provider and the general practitioner (GP) providing medical care for their residents. Consent for access to medical notes was obtained from the individual residents or their representatives.

Residents aged 65 years and older and under the medical care of the GP were recruited prospectively in each rest home during July–September 2013. Information on resident's characteristics, demographics, medicines and biochemistry results were obtained from the medication chart and clinical notes. Information included regular and when required (PRN) medicines, current and past medical conditions, sex, age, ethnicity, biochemistry results, activities of daily living, falls risk, number of hospitalisations in the past year and cognitive scores (e.g. mini-mental state examination).

Residents' falls risk is assessed routinely every 3 to 6 months internally in the residential care facility, using a falls risk tool adapted from the Eventide Nursing Home (supplementary material, Table S1). Residents were accordingly grouped as having a low, medium or high risk of falls. Residents with a medium to a high risk of falling were defined as 'fallers'.

All medicines prescribed were classified using the World Health Organisation Anatomic Therapeutic Classification (ATC) [13]. A Charlson Comorbidity Index (CCI) [14] and Katz Activities of Daily Living (ADL) [15] were computed for each resident.

The STOPP/START criteria were applied to each participant's data, by investigator Nagham Ailabouni (NA), to find the total instances of potentially inappropriate prescriptions (PIPs), potential prescribing omissions (PPOs) and the percentage of residents exposed to PIPs and PPOs. Residents with a medium or high falls risk (as recorded in their notes) were regarded as 'fallers'. Investigator (JT) re-applied the STOPP/START criteria to ascertain the accuracy of PIPs and PPOs.

A univariate regression analysis was undertaken with PIP exposure as the dependent variable. Independent variables were residents' characteristics: age group (65–74, 74–85, > 85 years-old); sex; polypharmacy (prescribed ≥ 5 medicines) or hyper-polypharmacy (prescribed ≥ 10 medicines); falls risk (low, medium or high); CCI and Katz ADL scores (Table 3).

Only regular prescribed medicines were included for calculating polypharmacy and hyperpolypharmacy. A binary logistic regression analysis was performed with PIP exposure as the dependent variable and including the resident characteristics, Katz ADL scores, and comorbidity as covariates. All analyses were conducted using SPSS version 21.0 (SPSS Inc., Chicago, Illinois). $P < 0.05$ was regarded as statistically significant (Table 3).

Table 1
Potentially inappropriate prescribing (PIP) identified by the STOPP criteria.

STOPP criteria	Total
Cardiovascular system (%)	
Loop diuretic for ankle oedema only (no clinical signs of heart failure)	7 (3.4)
Loop diuretic as first-line monotherapy for hypertension	1 (0.5)
Use of aspirin & warfarin in combination without a H2RA or PPI	1 (0.5)
Dipyridamole as monotherapy for CV secondary prevention	1 (0.5)
Aspirin with no history of coronary, cerebral or peripheral symptoms or occlusive event	10 (4.9)
Total cardiovascular system	20 (9.8)
Central nervous system (%)	
TCA with dementia	9 (4.4)
TCAs with cardiac conductive abnormalities	5 (2.4)
TCAs with constipation	5 (2.4)
TCAs with an opiate or calcium channel blocker	17 (8.3)
Long-term (> 1 month), long–acting benzodiazepines with long-acting metabolites	5 (2.4)
Long-term (> 1 month) antipsychotics (neuroleptics) as long-term hypnotics	1 (0.5)
Long-term antipsychotics (neuroleptics) (> 1 month) in those with parkinsonism	2 (1.0)
SSRIs with a history of clinically significant hyponatremia	1 (0.5)
Prolonged use (> 1 week) of first-generation antihistamines	3 (1.5)
Total central nervous system	48 (23.4)
Gastrointestinal system (%)	
Diphenoxylate, loperamide or codeine phosphate for treatment of diarrhoea of unknown cause	12 (5.9)
Prochlorperazine or metoclopramide with parkinsonism	3 (1.5)
PPI for peptic ulcer disease at full therapeutic dosage for > 8 weeks	1 (0.5)
Anticholinergic antispasmodic drugs with chronic constipation	1 (0.5)
Total gastrointestinal system	17 (8.3)
Respiratory system (%)	
Systemic corticosteroids instead of inhaled corticosteroids for maintenance therapy in moderate to severe COPD	1 (0.5)
Total respiratory system	1 (0.5)
Musculoskeletal system (%)	
NSAID with heart failure	1 (0.5)
Warfarin and NSAID together	1 (0.5)
Long-term corticosteroids (> 3 months) as monotherapy for rheumatoid arthritis or osteoarthritis	1 (0.5)
Total musculoskeletal system	3 (1.5)
Urogenital system (%)	
Bladder antimuscarinic drugs with dementia	4 (2.0)
Antimuscarinic drugs with chronic constipation	1 (0.5)
Antimuscarinic drugs with chronic prostatism	1 (0.5)
α – blockers in males with frequent incontinence (i.e. one or more episodes of incontinence daily)	1 (0.5)
Total urogenital system	7 (3.4)
Drugs that adversely affect fallers (%)	
Benzodiazepines (sedative, may cause reduced sensorium, impaired balance)	22 (10.7)
Antipsychotic (neuroleptic) drugs (may cause dyspraxia, parkinsonism)	39 (19.0)
First-generation antihistamines (sedative, may impair sensorium)	1 (0.5)
Long-term opiates in those with recurrent falls	37 (18.0)
Total drugs that adversely affect fallers	99 (48.3%)
Analgesic drugs (%)	
Use of long-term powerful opiates (e.g. morphine or fentanyl) as first-line therapy for mild to moderate pain	5 (2.4)
Long-term opiates in those with dementia unless indicated for palliative care of management of moderate/severe chronic pain syndrome	1 (0.5)