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Potentially inappropriate medication use in older people with cancer: Prevalence and correlates



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ABSTRACT

Objectives: Potentially inappropriate medication (PIM) use has been associated with an increase in adverse drug events, hospitalization and mortality. This study investigated the prevalence and factors associated with PIM use in patients presenting to a medical oncology outpatient clinic.

Materials and Methods: Consecutive patients ($n = 385$) aged ≥ 70 years referred to a medical oncology outpatient clinic between January 2009 and July 2010 completed a structured data collection instrument. The instrument assessed medication use, diagnoses, self-reported falls in the previous six months, pain (10-point visual analog scale [VAS]) and distress (10-point VAS). Frailty was defined using exhaustion, weight loss, Karnofsky Performance Scale, instrumental activities of daily living and physical function. PIM use was defined by the Beers Criteria. Logistic regression was used to compute odds ratios (ORs) and 95% confidence intervals (CIs) for factors associated with PIM use.

Results: In total, 26.5% ($n = 102$) of the sample used ≥ 1 PIM. The five most prevalent classes of PIMs were benzodiazepines ($n = 34$, 8.8%), tricyclic antidepressants ($n = 16$, 4.2%), alpha-adrenoreceptor antagonists (prazosin) ($n = 15$, 3.9%), propulsives (metoclopramide) ($n = 15$, 3.9%) and non-steroidal anti-inflammatory drugs ($n = 14$, 3.6%). In multivariate analyses, PIM use was associated with age 75–79 years (OR 1.83; 95%CI 1.02–3.26) compared to age 70–74 years, using ≥ 5 medications (OR 4.10; 95%CI 2.26–7.44) compared to < 5 medications and being frail (OR 3.05; 95%CI 1.18–7.87) compared to being robust.

Conclusion: More than one quarter of older people with cancer used one or more PIMs, and this was associated with being frail compared to being robust.

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1. Introduction

There were 9.2 million people aged ≥ 60 years with invasive cancer in the United States (US) in 2010.¹ The number of older people with cancer will increase due to population aging.² Older people are heterogeneous with regard to treatment tolerability and outcomes.³ Age-related changes in pharmacokinetics and pharmacodynamics mean older people are susceptible to adverse drug events (ADEs).⁴ Suboptimal medication use, poor functional status, geriatric syndromes, cognitive impairment, depressive symptoms, lack of social support and malnutrition have been associated with poor treatment outcomes among older people with cancer.³

In general population-based samples in the ambulatory setting, the prevalence of potentially inappropriate medication (PIM) use has varied from 12% to 63%.⁵ Medications can be defined as potentially inappropriate when the risks outweigh the benefits, particularly when safer alternatives exist.^{6,7} PIMs have been associated with ADEs, falls, fractures, lower scores on health-related quality of life, hospitalization and mortality.^{8,9} In two previous studies in older people with cancer, the prevalence of PIM use has varied from 21% to 41%.^{10,11}

The prevalence and factors associated with PIM use in older people with cancer have been investigated using a range of explicit and implicit approaches.^{12–14} However, to our knowledge, only one previous study has investigated factors associated with use of PIMs using Beers Criteria.¹¹ Prithviraj et al. reported an association between use of PIMs and breast cancer, polypharmacy and lower body mass index.¹¹ There was no association between PIM use and demographic factors, stage of the cancer, treatment options, Eastern Cooperative Oncology Group Performance Status, falls in the previous six months, number of comorbidities, low Mini-Mental Status Examination score, high Geriatric Depression Scale score, impaired hearing or vision, or level of perceived social support.

Geriatric syndromes (e.g. frailty, falls and impaired cognition) are rarely measured in clinical trials but their importance to medication selection and older peoples' quality of life is gaining recognition.¹⁵ No previous study has investigated the possible association between PIM use and frailty in older people with cancer. The objective of this study was to investigate the prevalence and factors associated with PIM use in patients presenting to a medical oncology outpatient clinic.

2. Materials and Methods

2.1. Design and Setting

Patients aged ≥ 70 years who attended the medical oncology unit at the Royal Adelaide Hospital (RAH) were referred to the geriatric oncology multidisciplinary team. The RAH is a 650 bed acute care metropolitan tertiary hospital located in Adelaide, Australia. This study sample consisted of all patients who attended the clinic between January 2009 and July 2010. Patients were excluded from the study if their structured data collection instrument was not retrievable or if their medication data were missing.

2.2. Data Collection

Patient data were collected by a 5-page structured data collection instrument based on the principles of comprehensive geriatric assessment. It included sections about demographics, diagnoses, medication use and clinical parameters. The clinical parameters included weight loss and falls in the previous six months, instrumental activities for daily living (IADLs),¹⁶ physical function (SF-36),¹⁷ Karnofsky Performance Scale (KPS),¹⁸ distress (10-point visual analog scale [VAS]),¹⁹ pain (10-point VAS),²⁰ and exhaustion score (adapted from the Center for Epidemiological Studies—Depression [CES-D] scale).²¹ The structured data collection instrument was completed by all patients with or without assistance from their carers before the patient's first consultation with the geriatric oncology multidisciplinary team.

The KPS was calculated by clinicians at the multidisciplinary team meeting following each patient's initial outpatient appointment. The KPS calculation was based on self-reported performance status in the data collection instrument and clinical data from the patient's initial appointment. A pharmacist researcher retrospectively extracted data from each structured data collection instrument and supplemented any missing data from each patient's medical records.

2.3. Medication

Medication use was assessed as the point prevalence at each patient's initial appointment. Patients were asked to self-report all medications they used in the structured data collection instrument. Data about prescription, non-prescription and complementary or alternative medication use were collected separately. The patient's self-reported list of medications was verified during the patient's first consultation with the geriatric oncology multidisciplinary team. The nurse had access to patient's medical records to assist in the verification process. If a medication taken by a patient was found to be missing from the self-reported list, it was added to the list.

2.3.1. Measures and Definitions

Prescription and non-prescription medications were categorized using the Anatomical Therapeutic Chemical (ATC) classification system recommended by the World Health Organization.²² Each patient's total number of medications were categorized as < 5 or ≥ 5 medications.²³ This was because polypharmacy defined using this definition has been associated with frailty, disability, mortality and falls.^{24,25}

PIM use was defined using the Beers Criteria,⁶ which are a list of consensus-based explicit criteria developed to define medications that are potentially inappropriate in people aged ≥ 65 years. The list includes criteria independent and criteria dependent on a patient's medical conditions. We chose to use the latest edition of Beers Criteria published by the American Geriatrics Society in 2012 to define PIMs. Earlier editions of the Beers Criteria have been widely applied internationally, including in Australia.^{24,26,27} Using the Beers Criteria also permitted comparison to two previous studies on PIM use in older people with cancer. We utilized Beers Criteria independent of medication dose as data on medication dose were not available. The five criteria excluded were, risperidone > 0.1 mg/day, digoxin

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