Exploring the prevalent drugs prescriptions in the elderly

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Background

- Understanding the prescribing patterns and identifying potentially inappropriate medications (PIMs) among older adults are crucial for optimizing medication management and ensuring patient safety
- Although the prevalence of commonly prescribed medications for older adults can vary across countries and regions, there is a lack of research investigating the most frequently prescribed medications for older adults.

Objectives

- To rank the top five drugs with the highest user prevalence by drug class in the Ajou University School of Medicine (AUSOM) database, focusing on older adult patients
- To compare these results with the Beers criteria, which provide guidelines for safe medication use in older adults
- To provide insights that can inform future efforts to improve medication management and health outcomes for older adults

Methods

1. Data sources
- Electronic medical records of AUSOM

2. Study population
- The elderly (aged over 65) with at least 1 day of observation in the AUSOM database from 2018 to 2022
- Stratified by age group (65-74, 75-84, > 85 years), year, gender, and hospitalization status to calculate total follow-up time

3. Main outcome measures
- Drugs were classified based on pharmacological class

  - Adrenergics
  - Antibiotics
  - Anticlotting agents
  - Corticosteroid
  - Antihistamine
  - Anti-infectives
  - Antiepileptics
  - Diuretics
  - Psychotherapuetic agents
  - Mucolytics
  - Antineoplastic and immunomodulating agents
  - Central nervous system stimulants

- User prevalence and prescription prevalence (per 1000 persons) for each pharmacologic class
- The numerator: the number of older adults using a particular drug or the number of dispensations
- The denominator: the total number of people per database and setting (inpatient and outpatient)

4. Ranking of Top Drugs and Identifying Potentially Inappropriate Medications (PIMS)
- The top five drugs with the highest user per prevalence (per 1000) were ranked within each drug class
- PIMs for older adults were identified based on the Beers criteria, which provide guidelines for safe medication use in this population

5. Data Extraction
- The analysis code used for data extraction was "DrugsInPeds," an open-source analysis code initially designed for pediatric populations
- Modifications were made to the age range and study date to suit the older adult population in this study

Results

1. Study population
- The study included 143,906 elderly participants, with females comprising 54.01% of the sample
- The total follow-up period was 109,314,889 days, with an average individual follow-up duration of 2.08 years
- On average, individuals in the outpatient population were prescribed 10.1 ± 14.0 different types of drugs

2. Prescription patterns by Age and Setting
- The relative number of prescriptions differed between the inpatient and outpatient groups, with 52.01% of prescriptions in the inpatient group and 50.71% in the outpatient group
- The youngest age group (65-74 years) had the highest percentage of prescriptions
- Analgesics, including non-steroidal anti-inflammatory drugs (NSAIDs), were the most commonly prescribed medications in both inpatients and outpatients
- Among all drug classes, Analgesics had the highest user prevalence, followed by Antihistamines and Adrenergic medications

3. Medication Use by Gender and Setting
- Overall medication use was higher in males in both inpatient and outpatient settings
- However, in the outpatient setting, the use of antiepileptics, corticosteroids, and psychotherapeutic agents was more common in females

4. Most Prescribed Drugs and PIMs
- The most commonly prescribed medications by class were similar in both inpatient and outpatient settings, except for adrenergic, anticlotting and antifibrinolytic, antineoplastic and immunomodulating agents, and antiepileptics
- A total of 26 potentially inappropriate medications (PIMs) were identified based on the Beers Criteria, with 21 identified in the inpatient setting and 17 in the outpatient setting. Below are the top five PIMs by Beers criteria in Inpatient and Outpatient setting

Inpatient			Outpatient		
Drug Class	Drug Name	Percentage (%)	Drug Class	Drug Name	Percentage (%)
Analgesics	tramadol	23.9	Analgesics	tramadol	20.5
Antihistamines	chlorpheniramine	13.5	Analgesics	aspirin	16.9
Diuretics	furosemide	11.7	Analgesics	ketorolac	10.8
Analgesics	ketorolac	10.2	Analgesics	ibuprofen	10.7
Antidiabetic drugs	Insulin, regular, human	4.9	Antiepileptics	gabapentin	6.9

Conclusions

- This study provided important findings regarding medication use patterns among older Koreans. Identifying the most commonly prescribed medications and potentially inappropriate medication use according to the Beers criteria can guide healthcare providers in improving medication management strategies for older adults
- Further research to better understand the potential risks and benefits of specific medications in the elderly population, assessing medication use patterns in the context of polypharmacy and examining the impact of medication use on disease incidence, prognosis, and overall health outcomes may provide a more comprehensive understanding of medication management among older Koreans
- In addition, considering the impact of specific diseases on medication use patterns may further assist in developing effective medication management strategies for this population

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