



JAMDA

journal homepage: www.jamda.com

Review Article

Prevalence of Potentially Inappropriate Medication Use in Older Adults Living in Nursing Homes: A Systematic Review



Lucas Morin MS^{a,*}, Marie-Laure Laroche MD, PhD^{b,c}, Géraldine Texier MD^d,
Kristina Johnell MScPharm, PhD^a

^a Aging Research Center, Karolinska Institutet and Stockholm University, Stockholm, Sweden

^b University Hospital of Limoges, Service de Pharmacologie, Toxicologie et Pharmacovigilance, Limoges, France

^c Université de Limoges, Faculté de Médecine, Limoges, France

^d University Hospital of Rennes, Palliative Care Support Team, Rennes, France

A B S T R A C T

Keywords:

Inappropriate prescribing
older adults
nursing home
pharmacoepidemiology

Importance: As older adults living in nursing homes are at a high risk of adverse drug-related events, medications with a poor benefit/risk ratio or with a safer alternative should be avoided.

Objectives: To systematically evaluate the prevalence of potentially inappropriate medication use in nursing home residents.

Evidence review: We searched in PubMed and EMBASE databases (1990–2015) for studies reporting the prevalence of potentially inappropriate medication use in people ≥ 60 years of age living in nursing homes. The risk of bias was assessed with an adapted version of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist.

Findings: A total of 91 articles were assessed for eligibility, and 48 met our inclusion criteria. These articles reported the findings from 43 distinct studies, of which 26 presented *point prevalence* estimates of potentially inappropriate medication use (227,534 nursing home residents). The overall weighted point prevalence of potentially inappropriate medication use in nursing homes was 43.2% [95% confidence interval (CI) 37.3%–49.1%], increasing from 30.3% in studies conducted during 1990–1999 to 49.8% in studies conducted after 2005 ($P < .001$). Point prevalence estimates reported in European countries were found to be higher (49.0%, 95% CI 42.5–55.5) than those reported in North America (26.8%, 95% CI 16.5–37.1) or in other countries (29.8%, 95% CI 19.3–40.3). In addition, 18 studies accounting for 326,562 nursing home residents presented 20 distinct period prevalence estimates ranging from 2.3% to 50.3%. The total number of prescribed medications was consistently reported as the main driving factor for potentially inappropriate medications use.

Conclusions and relevance: This systematic review shows that almost one-half of nursing home residents are exposed to potentially inappropriate medications and suggests an increase prevalence over time. Effective interventions to optimize drug prescribing in nursing home facilities are, therefore, needed.

© 2016 AMDA – The Society for Post-Acute and Long-Term Care Medicine. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

The number of nursing home residents is rising in most high-income countries.¹ In the United States, the number of nursing home residents has increased from 1.1 to 1.4 million between 1977 and 2013.^{2,3} The high prevalence of chronic multimorbidity and symptoms in this population of frail elderly individuals leads to complex medication regimens and to excessive polypharmacy.⁴ A recent systematic

review showed that up to 74% of nursing home residents were exposed to 10 or more drugs.⁵ Because of age-related physiological changes, older adults are at substantially higher risk of adverse drug-related events (eg, gastrointestinal bleedings, impaired cognitive function, injurious falls, and even mortality).^{6,7} Optimizing drug prescriptions in nursing homes is, therefore, essential. Medications are considered as potentially inappropriate for use in older people when the risk of harmful effects exceeds their expected benefit for the patient or when a safer, better tolerated or more effective alternative drug is available.⁸ Since the landmark initiative from Beers et al in 1991,⁹ several tools have been developed to help physicians identify these potentially inappropriate medications.^{10,11} In the community setting, 2 systematic

This work was supported by a grant from Forte (2014-4699).

The authors declare no conflicts of interest.

* Address correspondence to Lucas Morin, MS, Aging Research Center, Karolinska Institutet, 113 30 Stockholm, Gävlegatan 16, Sweden.

E-mail address: lucas.morin@ki.se (L. Morin).

<http://dx.doi.org/10.1016/j.jamda.2016.06.011>

1525-8610/© 2016 AMDA – The Society for Post-Acute and Long-Term Care Medicine. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

reviews have reported an overall rate of potentially inappropriate medication use of about 20%.^{12,13} In contrast, despite serious concern about the poor outcomes associated with inappropriate drug prescribing in nursing homes,¹⁴ no systematic review has been conducted on the institutionalized elderly. Yet, a comprehensive and comparative overview of this issue is necessary to inform clinicians, nursing home directors, and long-term care policy makers.

This systematic review aimed to investigate the prevalence of potentially inappropriate medication use in nursing home residents and to explore variations across geographic areas, time periods, and sets of criteria.

Methods

Design

We conducted a systematic review of the published literature. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist is available in [Table A1 \(Appendix\)](#).

Search Strategy

We searched in PubMed and EMBASE databases for relevant articles published between January 1990 and December 2015, using a combination of keywords and medical subject heading terms ([Table A2 in Appendix](#)). We limited our search to articles in English, French, German, or Swedish. The final literature search was performed on December 1, 2015. In addition, the reference lists of included articles were screened manually to identify potentially relevant studies.

Eligibility Criteria

Original studies were included if they reported the prevalence of medications explicitly considered as potentially inappropriate, in people ≥ 60 years of age living in nursing homes, regardless of the criteria used to assess drug inappropriateness. Studies published before 1990, investigating exclusively community or hospital settings, focusing on a single medication or medication group (eg, benzodiazepines), including only older people with specific physical or intellectual conditions (eg, dementia), or reported in non-peer-reviewed publications (eg, government working papers) were excluded. Studies reporting the outcomes of interventions designed to reduce inappropriate medication use and studies with a sample size < 50 individuals were also excluded, as they cannot provide representative prevalence estimates.

Screening and Study Selection

The title and abstract of retrieved articles were first screened by 2 investigators (L.M. and K.J.), with predefined eligibility and exclusion criteria. Duplicates were removed. The full-text copies of potentially relevant articles were then reviewed for inclusion. Any disagreement or uncertainty regarding the eligibility of an article was discussed until a consensus was reached.

Quality Assessment of Studies

The risk of bias in the included studies was assessed by 2 investigators (L.M. and G.T.) with an adapted version of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist¹⁵ ([Table A3 in Appendix](#)). Articles were given quality scores ranging from 0 (lowest possible score) to 30 (highest possible score), and were accordingly classified as high (≥ 25), moderate (20–24), low (15–19), or very low (< 15) quality. Discrepancies between the two reviewers were resolved by consensus.

Data Collection

Data were extracted and entered into a standardized spreadsheet under the following headlines: study characteristics (design, period, country, geographic coverage, data source, inclusion criteria, sample size), study population (sex, age, number of prescribed medications), measurement (point or period prevalence estimates, potentially inappropriate medication assessment criteria), quantitative results (total number of potentially inappropriate medications and number of individuals exposed to at least 1 potentially inappropriate medication), and narrative summary of findings. L.M. extracted all the data, and a second reviewer (M.L.) independently assessed a random sample of 10 articles to check accuracy. Disagreements and uncertainties regarding the data were discussed and resolved by consensus.

Data Synthesis

Prevalence estimates of potentially inappropriate medication use were considered as the main outcome of interest. Thus, results from studies reporting more than 1 estimation method (eg, comparing different criteria) were presented for each estimate separately. However, articles reporting the same estimate for the same study population were merged to avoid potential overlap (ie, “double count” of the same patients by different articles).

Prevalence estimates were calculated as the proportion of nursing home residents exposed to at least 1 potentially inappropriate medication at the time of the data collection (point prevalence estimates) or over the study period (period prevalence estimates). By pooling together point prevalence estimates and using the sample size as a weighting factor in random-effects models with unrestricted maximum likelihood, we modeled an overall average point prevalence rate with its 95% confidence intervals (CI). To explore potential variations, this average estimate was then stratified by geographic area (“European countries,” “Northern American countries,” and “other countries”), time period (“Before 2000,” “2000–2005,” and “2006–2014”) and set of criteria. To evaluate the influence of each study on the overall prevalence estimate, sensitivity analysis was conducted using the leave-one-out approach. Considering the heterogeneity in follow-up time and the lack of information regarding the length of the exposure to potentially inappropriate medication use, we were not able to compute an average weighted estimate of the period prevalence. All analyses were carried out using the Agency for Healthcare Research and Quality-funded, open-source software Open Meta-Analyst (Center for Evidence-based Medicine, Brown University, Providence, RI).¹⁶

Results

Review Process

Searches in PubMed and EMBASE databases yielded 1635 unique articles, of which 91 were included in the full-text review process. Of these, 48 articles reporting the results from 43 distinct studies met our inclusion criteria and were, therefore, included ([Figure 1](#)).

Characteristics of Included Studies

The included studies reported a total of 64 estimates of the prevalence of potentially inappropriate medication use among a total of 553,814 nursing home residents. As described in [Table 1](#), these studies were conducted in 18 different countries: 12 were conducted in the United States (259,802 residents), 6 in Canada (146,377 residents), 20 in Europe (142,298 residents), and 5 in other countries (5337 residents, including 3343 in Australia). Sixteen studies were conducted between 1990 and 1999, 9 between 2000 and 2005, and 18 between 2006 and 2014. Most studies ($n = 32$) assessed the use of potentially

Download English Version:

<https://daneshyari.com/en/article/5636922>

Download Persian Version:

<https://daneshyari.com/article/5636922>

[Daneshyari.com](https://daneshyari.com)