Reviewer's report

Title: Inappropriate Medication Use among the Elderly: a Systematic Review

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Reviewer: Paul F Gallagher

Reviewer's report:

The authors have addressed some of the points raised in my previous review of this paper. However, the fundamental issue is that the information presented in this review does not really add to existing knowledge and is unlikely to improve or advance clinical practice. There are numerous studies which have identified increasing age, female gender and increasing numbers of medications as risk factors for receiving potentially inappropriate medications.

The review only includes studies using "secondary data sources". This decision was based on the "greater representativeness of secondary data". Though large samples are desirable when measuring factors associated with inappropriate prescribing (and this is indeed a benefit of large administrative databases), this reviewer disagrees that secondary data are more representative than prospectively collected primary data sources when discussing appropriateness of prescribing in older patients. In fact, secondary data sources are more likely to exclude highly relevant instances of potentially inappropriate medication use in older people because of their inability to capture detailed information with respect to clinical status, co-morbid illnesses which might influence drug choice, drug dosage, patient choice, previous therapeutic failure or drug-disease interactions. Appropriateness of prescribing in older patients should be based on the clinical context and not just on a subset of drugs to avoid irrespective of diagnosis.

Secondary data sources are reliant on the quality of data entry and are usually retrospectively generated. This is reflected in the variables identified by the authors as being associated with inappropriate medication use i.e. age, gender and numbers of medications. Is gender really relevant to prescribing appropriateness in the clinical context? What would be of more interest from a clinical standpoint would be the influence of specific conditions or syndromes on the prevalence of inappropriate prescribing e.g. cognitive impairment, falls, incontinence or the use of specific medications with specific syndromes, at the very least those medications listed in Beers "considering diagnosis" list.

The authors have identified Beers criteria as being the most commonly used prescribing appropriateness criteria in their selected studies. However, they do not really address the well documented deficiencies of Beers criteria i.e. use of drugs listed in Beers criteria have not consistently been shown to be associated with adverse clinical outcomes, many of the drugs are rarely used in modern clinical practice and Beers' criteria have not been tested prospectively as an intervention to see if they truly impact on clinical outcomes. Furthermore, Beers'
criteria do not address therapeutic duplication or under-prescribing of beneficial medications.

The authors state that “19 of 628 studies met the inclusion criteria; 78.9% were conducted in the USA.” Does this 78.9% pertain to the 19 selected studies or the 628 identified studies? In the original version of this manuscript the authors state that 338 studies met the inclusion criteria with 78.9% from the USA. I accept that studies from Embase were included in the revision – was duplication in both databases accounted for? It seems unlikely that exactly the same proportion (78.9%) of both samples would be from the USA?

The study found that “11.5% to 62.5% of the elderly used some inappropriate medication”. This large range was identified in the small number studies selected by the authors for inclusion in the present review. It is incorrect to infer that this is representative of all elderly patients. The large range likely reflects the heterogeneity of the study methodologies and criteria used.

The authors should clarify what they mean by “elderly”. Is there a minimum age?

The line “Studies show that a knowledge of inappropriate use can help improve pharmacotherapy among the elderly, by providing input to regulatory action with a view to reducing the risks of illness, hospitalization and death”. This statement is vague. Specific examples should be given and should be supported by references.

The authors mention a review article by Forsetlund et al that has described interventions which can improve appropriateness of medication use in older patients in Nursing Homes. Is this study relevant to the current paper? (The authors specifically excluded nursing home residents). The authors have not included any references to randomized interventions that affect appropriateness of prescribing in the general older population e.g. comprehensive geriatric assessment (Schmader 2004, Saltvedt 2005, Strandberg 2006) or the clinical implementation of prescribing appropriateness criteria such as STOPP/START (Gallagher 2011) or computerized decision support tools (Tamblyn 2003; Peterson 2005).

Level of interest: An article of limited interest

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests