Reviewer's report

Title: Multiple component interventions for preventing falls and fall-related injuries among older people: systematic review and meta-analysis

Version: 2 Date: 14 November 2013

Reviewer: Astrid Zech

Reviewer's report:

General comment:

First of all, the lack of line numbers in the manuscript makes the review process more complicated.

This manuscript describes a meta-analysis of the effects of multiple component interventions for preventing falls and fall-related injuries among older people. The benefits of multicomponent interventions have been questioned previously (e.g. Guidelines of the American Geriatrics Society and British Geriatrics Society 2011). This emphasizes the importance of research in this field and the potential of this review. The meta-analysis demonstrates the effectiveness of multicomponent interventions for fall prevention. Methods are mostly appropriate and well described. The manuscript is adhere to the relevant review standards but lacks description of quality assessment. The greatest limitations of this work concern the extensive inclusion criteria (community-dwelling and those in hospitals or care homes) and lack of exclusion criteria (all medical conditions and healthy individuals). Therefore, no real “practical” recommendations can be given for a targeted application of multicomponent interventions. Although the authors differentiate between “high and low risk of falling” in the methods, no differences were made between both groups for pooled effect size calculation. Furthermore, potential strengths of this review were not really utilized due to lack of comparisons between interventions with and without specific components (e.g. exercising) or longer vs. shorter duration. Hence, major revision is needed.

Specific comments:

Abstract:

1. The abstract should include a short description of multicomponent interventions. From reading the abstract alone it is unclear whether multicomponent interventions are limited to specific components or include all strategies (exercises, passive interventions, environmental changes, education etc)

2. Please specify “older people” (e.g. age, community-dwelling and health status)

3. How was the meta-analysis performed (risk ratio calculation)?

4. Results: Fall reduction in comparison to what? No interventions? Single interventions?
5. Conclusions: Does the review provide data whether multicomponent interventions might be more beneficial than others?

Introduction

The introduction lacks important background information on the effects of single strategies (e.g. exercises, external measures etc.) for fall prevention in older adults. As the authors stated, there is wide evidence for the effectiveness of these strategies for fall and injury prevention in older adults of different health and living status. However, what are the crucial components for fall prevention? And why are multicomponent interventions considered more beneficial? E.g. in their “Summary of the Updated American Geriatrics Society/British Geriatrics Society Clinical Practice Guideline for Prevention of Falls in Older Persons”, published in 2011, the American Geriatrics Society and British Geriatrics Society stated that less than half of the studies with multiple component interventions showed significant effects on reducing fall risk.

Specific comments

1. A reference should be added to the first sentence
2. “evidence for combined interventions (b and c, above) is less clear” Why? Due to inconsistent findings, the lack of RCT`s or the methodological heterogeneity?
3. “and might therefore be a more cost-effective approach“ please specify and provide more information that supports this statement
4. “to establish the effectiveness of multiple component interventions” in comparison to no interventions or single interventions?

Methods

1. Which key words were used?
2. Were reference lists of articles scanned?
3. Were there any exclusion criteria?
4. “whole populations,[11] community-dwelling older people [3] and those in hospitals and care homes” It can be assumed that both populations respond differently to multiple component interventions. I recommend differentiating between community-dwelling and assisted-living older people.
5. “Studies that included younger participants, for example recruited on the basis of a medical condition such as a stroke or Parkinson’s disease” does that mean that all medical conditions were included? This should be stated explicitly.
6. specify “known fall risk factors”
8. “Those with prior falls, known fall risk factors, living in residential care, aged #75 years, or with impaired strength or balance were identified as high risk of falling.” What was the rationale for choosing these criteria?
9. How was quality assessment performed?
Results

1. The description of studies should provide information on medical conditions as well as living status
2. Please provide data for the methodological quality
3. What was the mean intervention duration and weekly frequency?
4. “interventions including medication (n=3), continence management (n=1), fluid or nutritional supplements (n=2), psychological interventions (n=4), environment or assistive technology (n=5), and, knowledge (n=10).” Please, specify “knowledge”
5. “A beneficial effect of multiple component interventions was observed for the number of people that fall (risk ratio =0.85, 95% CI 0.80 to 0.91, Figure 3) and fall rate (rate ratio =0.80, 95% CI 0.73 to 0.88, Figure 4).” this indicates beneficial effects of interventions with two or more components in comparison to no intervention, regardless of which components were used. However, it is more interesting whether interventions with more than two components are more beneficial than interventions with only two components? Or whether the combination of exercising and another component shows higher effects than the combination of two non-exercising interventions. Furthermore, the total period or number of interventions could also have influenced the effects. This section needs to be revised accordingly. Otherwise, the news value of this review is limited.

Discussion

There should be a more detailed discussion based on current concepts and hypothesis. More references are needed and relevant findings should be compared to those from other studies (meta-analysis).

1. “We found that, overall, interventions were effective at reducing…” what is the news value of this review? Please specify this statement
2. “In our review, most of the comparisons included in the meta-analyses included exercise, indicating that exercise is likely an essential component in effective fall prevention” this is speculative. No comparisons were made between interventions with and without exercises

Conclusion

1. “A consistent element of the multiple component interventions in almost all studies was exercise, and this suggests that exercise should be considered an essential component for falls prevention services that are aimed at both those at high risk of falling and the general older population.” This statement can be easily supported (or rejected) by the calculation of pooled effects sizes for interventions with and without exercise interventions. At this point, one may ask why the authors did not perform more detailed analyses although sufficient data were available.
Level of interest: An article of importance in its field

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