

Reviewer's report

Title: Risk factors for recurrent injurious falls that require hospitalization for older adults with dementia: a population based study

Version: 0 **Date:** 04 Mar 2016

Reviewer: Susan Hunter

Reviewer's report:

This is an interesting study using population linked information from hospital admission and death registry to evaluate fall-related injuries that required hospitalization. Importantly, the study addresses the under-studied, though very vulnerable, patient population of older adults with dementia. I feel there are some deficiencies in the reporting of the methods to fully understand the study processes, including the assumption of the index hospital admission as the time of new diagnosis and the actual fall outcome of interest.

Major Concerns

Abstract - conclusions. "screening for falls history at the time of dementia diagnosis" is not substantiated with this study as it is not substantiated that the index admission is the time of diagnosis.

Was end of follow-up always related to death or the end of the time frame of study interest? Could people move out of the area and then how would this information be captured?

Page 4, line 1-10. Please provide references to support the statements in the first and third sentences.

I am not entirely clear of the methodology after the selection of all hospital admissions of any cause with a dementia diagnosis. My understanding is that the hospital records were searched for each person for all admissions with an injury and fall coding after the time point they are identified with the index admission to hospital for any cause. So then people would have had to have 2 or more admissions for a fall-related injury to be identified as a faller after the index admission? Or was it anyone who had any fall-related injury admission? This is not well described in the methods and needs clarification. Also please be consistent with the terminology throughout the paper for the outcome, for example on page 9, line 46 - the discussion references recurrent falls and the abstract and methods talk about "recurrent injurious falls". Is there information on the type of residence the person was living, such as community-dwelling or nursing home. I assume there may be a different threshold for seeking medical care across living residence, either more likely to go to hospital or conversely if there is medical staff on site that can treat something that another centre without onsite medical staff may not be able to treat then the threshold is lower to send the person to hospital.

Page 5, line 36-44. Not sure the distinction for participant exclusion based on dementia of drug, alcohol or HIV and yet include Creutzfeld-Jakob disease. I am also uncertain about the "non-specific dementia" category and the possibility that it includes the conditions that were specifically excluded.

Page 5, line 44-49. The exclusion of people with an admission that includes a diagnosis of dementia prior to the time frame of interest is not clear. Also please clarify the wording, "previous hospital record for dementia" - does this mean a primary diagnosis or admission reason being dementia rather than a person having any admission with an accompanying diagnosis of dementia. Please clarify whether the intent was to assume an admission that corresponded to "dementia" being a relevant co-morbidity as timing for the provision of a new diagnosis of dementia, stated within the abstract "screening for falls history at the time of dementia diagnosis". How can one presume that the person did not receive a dementia diagnosis at some time prior to the index hospital admission? This needs to be more elaboration of the limitations of this assumption in the discussion.

Is it possible to provide a summary of the types of injuries that were sustained by the people? This information would be informative as previous research for falls in the general population of older adults have provided a summary of the types of injuries. There may also be social reasons for one person being admitted to hospital and another person being discharged home after the same type of injurious fall. In the discussion, page 13 line 46-48, it would be important to know what kind injuries were present for these people to give a context to this statement or justify why the information was not collected. There needs to be more discussion of possible limitations to this in the discussion.

Coding for the comorbidity variable needs further justification. Why is someone with 1 comorbidity seen as being equivalent to someone who might have 17 comorbidities? Yet, why are different comorbidities seen as equivalent in disease burden and a simple sum is used to give a summary value (page 6, line 58)? On page 6, it is stated that an unweighted comorbidity score was assigned based on the cumulative number of comorbidities, yet comorbidity is presented as a dichotomy in Table 1 and would appear to be a dichotomy in the regression analysis. Can you please clarify.

Could you clarify if the hospital records reviewed included emergency room visits or only people who were admitted to stay in the hospital? Was there a time frame required for admission duration, for example the person had to be in hospital for 24 hours or something. Some fall-related injuries could be treated solely in an emergency room visit (e.g., wrist fracture not requiring surgery) versus a hip fracture requiring a hemiarthroplasty. Also is it possible to provide information on length of hospital contact, such as emergency room visit without admission or hospital admission for x number of days. Again there may be social reasons for one person being admitted and another not to be admitted after an injurious fall that have nothing to do with the injury directly. Please provide clarification.

Page 6, line 34-39. What if there wasn't a previous hospitalization?

Table 1 needs to be cited in the text.

Page 10, line 7. The statement relating to the importance of these findings at time of diagnosis is not supported and the methodology as written cannot accurately determine time of diagnosis. At some time between one hospital admission and an admission with dementia listed as a medical condition, a diagnosis occurred. So unless there is additional information that was not included in the methods to corroborate the index admission as the time of being newly diagnosed with dementia, then this speaks beyond the data. Please clarify.

Table 1. In the headings for falls (no falls, 1 fall, 2 or more falls), are these 1 injurious fall and 2 or more injurious falls? Please amend wording for precision of information and consistency with in manuscript. Also the title of the table is not very informative as written, more detail is required.

Table 2. Is "fall in previous year" any fall type? Please clarify in text. Are the variables listed in Table 2, the only variables that were included in the adjusted analyses? How was this subset of variables selected?

Minor Concerns

Please review the manuscript for some errors in grammar.

Are the methods appropriate and well described?

If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?

If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?

If not, please explain in your comments to the authors.

Unable to assess

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?

If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English

Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

Declaration of competing interests

Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?
2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?
3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?
4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?
5. Do you have any other financial competing interests?
6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

I declare that I have no competing interests.

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (<http://creativecommons.org/licenses/by/4.0/>). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal