Author's response to reviews

Title: Outcomes after Fixation for Undisplaced Femoral Neck Fracture Compared to Hemiarthroplasty for Displaced Femoral Neck Fracture among the Elderly

Authors:

Chien-Fu Lin (cflin.ntpu@gmail.com)
Wen-Miin Liang (wmliang@mail.cmu.edu.tw)

Version: 6 Date: 8 May 2015

Author's response to reviews: see over
Author's response to reviewers
Title: Outcomes after Fixation for Undisplaced Femoral Neck Fracture Compared to Hemiarthroplasty for Displaced Femoral Neck Fracture among the Elderly

Authors:
Jeff Chien-Fu Lin (cflin.ntpu@gmail.com)
Wen-Miin Liang (wmliang@mail.cmu.edu.tw)

Version: 2 Date: 8 May 2015

Author's response to reviews: see over
We thank all the reviewers for their valuable responses. We have revised our manuscript based on the associate editor’s comments and we have described these changes for each response below.

Response to comments from the Associate Editor:

1. Please note that the classification system for femoral neck fractures is the Garden classification (it is referred to as the Gardner classification in the manuscript).
   Answer:
   
   Ans: Thank you for this comment. We have corrected our typos throughout the revised manuscript.

2. While it is typical for Garden I/II fractures to be referred to as ?undisplaced,? and Garden III/IV as ?displaced,? it remains unclear how the authors were able to identify which type of fracture each patient had? This information is not included within the ICD-9 codes. I presume that the NHIRD mandates reporting of an additional modifier to certain ICD-9 codes to specify whether they are displaced or undisplaced? If this is correct, this should be explicitly stated by the authors in the Methods (lines 99-105)
   
   Ans: Thank you for this comment. NHIRD also contains additional codes termed “National Insurance Codes” that are used to provide more detailed information during admission. The “National Insurance Codes” allow us to use the ICD-9 codes and the “National Insurance Codes” simultaneously to identify undisplaced and displaced femoral neck fracture.

   We have revised our Methods section on page 5, lines 99-104, as followed:
   
   Page 5: “According to the guidelines of the National Health Insurance (NHI) program in Taiwan, Garden Types III and IV are classified as displaced femoral neck fracture, Garden Types I and II is classified as undisplaced
fracture. The NHIRD also contains additional information in the form of “National Insurance Codes”, which are different from ICD-9 codes, to allow the identification of undisplaced and displaced femoral neck fracture.”

3. I am not sure that the authors have adequately explained, in layman terms, what? competing risk analysis? is in the context of their study (lines 134-139). This may remain unclear to anyone who is not already familiar with this methodology."

Ans: Thank you for this comment.

We have revised our sentence in the revised manuscript as described on pages 6-7, lines135-154.

Page 6-7: “We estimated the survival rate on the basis of the Kaplan–Meier (KM) method to analyze the overall survival. We explored the effects of risk factors on survival using the log-rank test and multiple Cox’s proportional hazards model. Osteoporotic hip fracture causes excess mortality and thus there are no data for complications in subjects who died. That is to say, for subjects who have died, there are no complications after the date of death. In this situation, death is referred to as a “competing risk” for the outcomes (complication) of interest. A competing risk of death is an alternative outcome that is equally or more important than the primary outcome (complication) and alters the probability of the outcome (complication) of interest. Statistical approaches, such as KM estimator and Cox’s proportional hazards model, are typically applied to describe all-cause mortality rather than incident disease or complication. When KM estimates are used to describe outcomes other than all-cause mortality in the presence of a significant and related competing risk of death, the KM estimates lead to biased results because the proportion of death is large and increases with follow-up time. An alternative statistical approach has been developed to account for the presence of competing risks and is termed "competing risk analysis". In our study, subjects had a considerably high number of comorbidities, so the competing risk of death was especially high compared to the risk of complications. It is important to adequately account for the competing risk of death in the analyses. Therefore, we estimated the cumulative incidence of first complication according to the cumulative incidence function of competing risk analysis to analyze the complication-free time [35-37, 39,47].”