Reviewer’s report

Title: Prognostic nomogram for inpatients with asthma exacerbation

Version: 0 Date: 26 Sep 2016

Reviewer: Miaozhu Li

Reviewer's report:

To authors:

Overall, the work of the manuscript BMC Pulmonary Medicine - PULM-D-16-00290 is an interesting contribution to the literature in this area.

The authors have built a novel prognostic model using nomogram for inpatients with asthma exacerbation and identified the risk factors including older age, male, lower level of consciousness, more severe dyspnea, endotracheal intubation within two days after admission, pneumonia and heart failure. A great number of 19,684 asthma patients from the Japanese Diagnosis Procedure Combination database was been used to find the prognostic factors which could predict in-hospital mortality in patients with asthma exacerbation.

However, the study was still not very convincing for its claims because of lack of the consideration of some important prognostic factors, the details in the statistical section in terms of some indispensable evaluation and it is also lack of discussion on advantage of the prognostic nomogram which is usually used in oncology.

Here, I list my specific concerns for the manuscript below:

Background: P3. Line36 - Line41; Discussion: P10. Line9 - Line12:

As the authors claimed nomograms were widely used as prognostic tools in oncology. It would be better to discuss more about the advantages of using nomogram on the basis of the multivariable logistic regression analysis and its impacts on helping the physicians to make clinical decision for asthma patients.

Methods: P5. Line31 - Line56:

The authors identified the patients' characteristics including age, sex, BMI, consciousness level and etc., yet they did not include some relevant factors e.g. family history of asthma, ever smoking, the presence of wheezing or whistling, current asthma medication use, tests of lung
function and etc. which might also influence the asthma exacerbation. These genetic and environmental factors may also contribute to the mortality in patients with asthma exacerbation who required hospitalization. And it would be necessary to present the descriptive tables of these factors if they had the data, and include them in the selection model.

Methods: P6. Line2:

Chi-square tests are usually used in the data with normal distribution. However, the authors did not describe what were the distributions of the sample. It should first present appropriate normality test and then use the corresponding methods to compare the groups.

Methods: P6. Line7 - Line9:

The authors only applied the bootstrapping method for internal validation. They did not claim whether the data was from only one center or several different centers. If the data was from multiple centers, external validation could be performed to test the robustness of the model in a separate validation cohort of patients who were prospectively recruited from different centers.

Also, it is common to use both the discrimination and the calibration of the model to evaluate the predictive performance of the model. It would be better to provide the discrimination ability of the prognosis model as well.

Discussion: P10. Line1 - Line3:

The authors have first found the associations of lower level of consciousness and more severe dyspnea and asthma mortality in adults. It would better to discuss more about the possible mechanism of these newfound factors.

Additionally, it has been reported there was association between persistent asthma and cardiovascular diseases. Markers of inflammation like C-reactive protein, IL6, fibrinogen were significantly elevated among persistent asthma patients. It would be interesting if they also include these variable in the analysis if the data is available, as this study also found the association of heart failure and asthma mortality.

Date: Sep 26, 2016

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.

No

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:

Acceptable

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