Reviewer’s report

Title: Incidence of chronic bronchitis among pulp mill workers with repeated peak exposures to sulphur dioxide and other irritant gases

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Reviewer: Yuh-Chin Huang

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Andersson et al reported in this study the incidence of chronic bronchitis in pulp mill workers. The data were obtained by questionnaire. The response rate was 44%. They found incidence rate for chronic bronchitis among workers with repeated peak exposures was about two times that of unexposed workers. The risk was even higher in a subgroup with frequent peak exposures. The authors recommended that preventive actions be considered for this work environment.

A major strength of the study was the inclusion of a very large cohort of workers. The study was well executed given the constraints of this kind of study. The results support the association between occupational exposure to irritants and chronic bronchitis.

Major comments:

1) Material and Methods:
   a. Cohort, 2nd para: What was the rationale for limiting the study period to 1970-2000, especially since the data were available since 1940?
   b. Exposure. Page 5. It would help the readers that the authors describe the exposure condition in the work environment in more detail, including the tasks workers in different departments did, estimated (or measured) levels of irritant gases (SO2 etc) at work and in different departments, cumulative exposure over the time of employment, use of protective devices, etc. A table that describes the number of workers in each department stratified by the level of exposure will be helpful.
   c. Exposure, 2nd para: Please define “few periods of acute exposure” and “frequent periods of exposure”.
   d. Statistics. Page 6, last sentence. How did you know it had no influence before you ran the model? Gender needs to be included in the Cox model for ever smokers.

2) Results. Was the incidence rate or prevalence of chronic bronchitis constant during the study period, or was there a time trend?

3) Table 4 showed that hazard ratio for smokers was lower than that for nonsmokers. The authors tried to explain it by hypothesizing “healthy subjects, irrespective of exposure to irritants and peak exposure episodes, could start or continue smoking” (Discussion, 3rd para). However, the explanation could not explain the greater pack-year in exposed workers. Since smoking may also
cause symptoms of chronic bronchitis, were there differences between smokers and nonsmokers in response rate to questionnaire, employment time, etc?

4) How do you account for recall bias that may lead to misclassification of smokers and nonsmoker since your definition of smoking is quite liberal, daily smoking 1 year? If you use stricter criteria for smoking (such as pack-year), would the results be the same? Any correlation between smoking and exposure?

5) Discussion, 5th para. Whether or not non-response bias will affect the results also depend on the nature of the study (i.e. what questions and endpoints one uses for the study in what population). Its specific effects thus should be assessed by statistics and potential impact be discussed. Dismissing this bias based on studies in different population on different endpoints is not advisable, especially since the response rate was only 44%.

6) Please provide statistics for exposed vs. unexposed in Tables 2 and smokers vs. nonsmokers in Table 3.

Minor comment:

1) The term “combinative effect” is used in the discussion to describe the interaction between smoking and exposure. It should be antagonistic or negative effect.

2) Methods, Exposure, 1st para. Please define “acutely exposed” more clearly. The definition of “peak exposure” is vague. “Peak exposure” usually refers to exposure to peak concentration of irritants. It appears that in this manuscript, the authors used “peak exposure” to refer to the exposure episodes associated with symptoms. Perhaps a different terminology should be used to better reflect this definition to avoid confusion (such as symptomatic exposure). In 3rd paragraph, if the subjects did not report exposures, there should be no “peak exposure”. Please clarify the definitions for all the terms related to exposure.

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

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