Reviewer’s report

Title: Longitudinal study of respiratory function and symptoms in a non-smoking group of long-term officially-acknowledged victims of pollution-related illness

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Reviewer: Hiroshi Mukae

Reviewer’s report:

Comments to the author,

Tanaka and colleagues report a longitudinal study of respiratory function and respiratory symptoms in non-smoking patients of air pollution victims with chronic bronchitis, asthma and emphysema from 2000 to 2009 in Kurashiki city, Japan. This is very unique and interesting study to demonstrate longitudinal effects of temporal environmental exposure to air pollution on pulmonary function and subjective symptoms in non-smoking patients with respiratory diseases in a particular industrialized city in industrialized country. The authors conclude that the effect of temporal air pollution to pulmonary function and respiratory symptoms of them were mild, even though their complicated respiratory diseases. It might be more interesting if the authors could add more data on the treatment status for their respiratory diseases in relation to the change in pulmonary function and respiratory symptoms in these patients.

Major comments:
1. If the authors have the data of the relationship between the level of air pollution and the change in respiratory function and symptoms during more polluted era (around 1970), it might be more interesting.

2. Were the data of 2000 and 2009 compared, or were the yearly consecutive data from 2000 to 2009 analyzed?

3. Treatment status in these patients may affect respiratory symptoms and pulmonary function during the study duration. If the authors have the data of the content of the treatments, please add the data and describe it.

4. Please discuss the relationship between the results of concentrations of air pollution (Figure 2) and the changes of pulmonary function from 2000 to 2009. Do the authors want to describe that temporal exposure to high concentration of air pollution before 1975 does not influence the decline of pulmonary function from 2000 to 2009, even though worsening or sustention of respiratory symptoms?

Minor comments:
1. It might be more interesting if the authors could show the causes of deaths among these victims with stratified analysis in each era or pollution level.
2. FEV1 /FVC should be expressed as % or ratio throughout this article.

3. If you use the data from previous reports as shown in discussion, it is necessary to show the air pollution levels of each previous paper.

4. Page 3, line 12
   …significantly over time (P<0.01), But…
   ->…significantly over time (P<0.01), but…

5. Page 8, Line 2;
   The majority of these patients were diagnosed with chronic bronchitis (n = 528, 68.2 %), asthma (n = 242, 31.3 %), or emphysema (n = 4, 0.5%), and complete spirometry data for the preceding 10 years were available for most.
   ->What were diagnostic criteria of chronic bronchitis, asthma and emphysema used in this study?

6. Page 8, Line 6;
   A further 167 patients were excluded because they were former or current smokers.
   -> If the authors have additional data of pulmonary function tests in smoking patients, it may be interesting to see combined effect of smoking and air pollution exposure.

7. Page 8, Line 8;
   These patients included 156 males and 407 females who had been certified for 25.9 ± 4.6 years (males: 26.0 ± 4.6 years, females: 25.9 ± 4.6 years).
   -> What is the reason of gender difference (more female patients)? Are they more smoking male patients?

8. Page 12, Line 4-8;
   “However, 99.8% of patients ~ cough and sputum production”
   Category 4 symptoms seem not to be severe, and “severe” symptoms in each category should be defined.

9. Page 13, line 5~line 9 and Table 2
   “In males, the mean~ worsening dyspnea ”
   In contrast to larger annual decrease of pulmonary function in male than female patients, intensities of worsening of dyspnea were not different. Please add the discussion of the reasons of this.

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' below.