

## Peer Review File

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### Reviewer A

This study reinforces the message that CT scan should not be performed in patients with chronic cough. I fully agree with the authors. However, I have comments to address:

#### Major comments

Comment 1: One of the major limitations of this study is the complexity of the definition regarding major and minor abnormal lesions. To me, it is unclear if major lesions are lesions associated with severe diseases or lesions that trigger cough. If the authors associate major lesions with severe disease, they should explain why bronchiectasis are only in the minor abnormal lesion group. Indeed, severe bronchiectasis not seen on chest X-Ray could appear in the major abnormal lesion group. The title is a bit unclear because before reading the manuscript, we don't know if we will get data on lesions triggering cough or only severe diseases associated with a diagnosis of chronic cough. The title should be more explicit. In a similar way, focal fibrosis seems to be more severe than small solitary nodules.

Reply 1: Thank you for your constructive and helpful comments. We agree that it is unclear whether the major or minor lesions cause chronic cough. In this paper, we defined 'major abnormal findings' by the presence of malignancy, infectious diseases, or other critical conditions that warrant immediate treatment decisions, rather than by the possibility as an etiology of cough, because it was difficult to determine a causal relationship in this routinely collected database analysis.

Based on your comments, we have revised classification of CT findings in Methods and limitation lines 130-133 and 245-248, respectively.

*"This RCD based study presents challenges in determining the causal relationships between CT findings and chronic cough. The CT findings were arbitrarily classified into three groups based on the needs for immediate management: (1) major abnormal, (2) minor abnormal, or (3) normal."*

*"Third, our classification of chest CT findings (major or minor) were arbitrary, and we could not confirm whether they are directly related to the cause of chronic cough. To our knowledge, there is no consensus on how to classify CT findings in relation to cough causes and outcomes."*

Comment 2: The present study is performed on patients with chronic cough. I fully agree with the authors that CT scan should not be prescribed in patients with chronic cough. However, the situation is a bit different in patients with refractory chronic cough. Do the authors have the possibility to evaluate the proportion of refractory chronic cough? This entity should be mentioned in the discussion. The conclusion of this study

should be made for patients with chronic cough and not refractory chronic cough.

Reply 2: Thanks. Unfortunately, it was impossible to identify patients with refractory chronic cough using the routinely collected database. We agree that the benefits of CT scans, including the relief of health anxiety, may be additional or higher in patients with refractory chronic cough. We have added a limitation as following in lines 250-252.

*“Fourth, we could not differentiate patients with refractory chronic cough in this RCD. Further studies are warranted to evaluate benefits of chest CT scans in patients with refractory chronic cough, including etiological confirmation and psychological impact.”*

Comment 3: In the European guidelines, it is indicated that CT scan should not be routinely performed in patients with normal chest X ray and normal physical exam. However, in this study, there is no information on physical exam. Could the authors detail physical exam of patients?

Reply 3: Thanks. We agree that physical examination is an important part of baseline assessment. However, a case report form used in this database did not include a structured form for physical examination findings. We have added this limitation in lines 244-245.

*“Additionally, there was no information on physical examination findings in a structured case report form.”*

Minor comments

Comment 1: Could the authors clarify the following sentence: “25 ground glass opacity, emphysema”? Is it only one pattern or 25 patients with GGO and 25 with emphysema?

Reply 1: Thanks. We have corrected it as follows in lines 174.

*“25 ground glass opacity, 23 emphysema, 13 bulla, 5 pleural thickening/pleural plaque, and 1 subpleural reticular opacity (Figure 2 and Table 2).,”*

Comment 2: Line 141, “in” twice on a row

Reply 2: We have deleted it.

Comment 3: In sup table 1, “n” and “%” in the same bracket is confusing. Please separate “n” and “%”.

Reply 3: Thanks. We have made the revisions.

Comment 4: Suppl table 2 should be integrated into the main manuscript because it detailed

major results

Reply 4: Regarding reviewer’s comment, we have moved “Supplement Table 2” to “Table 2” in the main manuscript.

**Reviewer B**

In this manuscript, the authors have analyzed the data of chest CT utilization and diagnostic outcomes in chronic cough patients with normal chest X-rays from a tertiary academic hospital in a retrospective way. They have found that in 20% chronic cough patients with normal chest X-rays who underwent Chest CT scans, only 8 of 1,006 (0.8%) patients had major abnormal findings (4 pneumonia, 2 pulmonary tuberculosis, and 2 lung cancer), while the others had minor findings or normal CT scans. They have concluded a routine chest CT scan may not be warranted in chronic cough patients with normal chest X-rays. The findings in the study are meaningful and seem to support the recommendation regarding chest CT scans in several international guidelines for management of chronic cough. I only have several issues that may need to be addressed.

#### Major comments

Comment 1: Chest CT scan may not be ordered to chronic cough patients with normal chest X-rays, as indicated by the data in the study. However, one concerns in what situations chest CT scan should be prescribed to these patients. Although a low diagnostic yield of chest CT scan in the cohort of patients with chronic cough, early diagnosis of cancer may improve the prognosis of patients with such a disease. Some clear comments may need to be added to the discussion section.

Reply 1: Thank you for your reviews and comments. We agree that potential benefits of chest CT scans include (1) etiological evaluation of chronic cough, (2) reduction of health concern, and (3) identification of hidden critical condition such as malignancy. We have added potential benefits beyond etiological evaluation in line 229-231.

*“Also, early diagnosis of hidden critical lung lesions through chest CT scans may improve the prognosis of patients with chronic cough, especially those with lung cancer, which would be additional benefit of CT scan beyond etiological evaluation.”*

Comment 2: Currently, there is also controversy regarding the initial selection of either chest X-rays or chest CT scan for the patients with chronic cough. Chest CT scan can find occult bronchiectasis and lesions overlapped with the diaphragm, which cannot be identified by Chest X-rays. In some situation with these risk factors, the initial chest CT scan may detect this abnormality and decrease the unnecessary chest X-rays. How to make clinical decisions on these occasions also needs some comments even though it is not the purpose of the study.

Reply 2: Thanks. We agree with your comment. We think the choice of chest imaging modality may be different depending on clinical context, particularly in patients with refractory chronic cough. Considering the potential cancer risk from chest CT radiation exposure, we may make decision of chest CT scan in patients without a clear diagnosis or a chronic cough that is refractory to treatment. We have added it in discussion lines 232.

*“Thus, the choice of chest imaging modality may depend on clinical context.”*

Comment 3: What are the causes of chronic cough in patients with minor and major abnormal findings of chest CT scan? Was any difference in cause distribution of chronic

cough between the patients with abnormal and normal findings of chest CT scan? If these data can be provided, it will strengthen the conclusions and findings of this study.  
Reply 3: We agree with reviewer's comments. Unfortunately, we could not determine etiologies of chronic cough in routinely collected medical records. We have added it as a limitation in line 250-252.

*"Fourth, we could not differentiate patients with refractory chronic cough in this RCD. Further studies are warranted to evaluate benefits of chest CT scans in patients with refractory chronic cough, including etiological confirmation and psychological impact."*

#### Minor comments

Comment 1: Please briefly explain why chest CT scan was more often prescribed to patients with longer cough duration, older age, male sex, more smoking history, etc.

Reply 1: Thanks. We have added the speculation in conclusion lines 200-202.

*"The reasons for the associations are not clear, but it may be partly because such factors are perceived as risk factors of malignancy and they may influence patient preferences and physician decision."*

Comment 2: One "in" in line 141, page 8 may need to be deleted.

Reply 2: We have deleted it.