Letters to the Editor

Chest Imaging Tests versus RT-PCR Testing for COVID-19 Pneumonia: There Is No Best, Only a Better Fit

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Editor:

We read with great interest the articles by Ai and colleagues (1), Herpe and colleagues (2), Wong and colleagues (3), Bai and colleagues (4), and Sardanelli and colleagues (5) in *Radiology*. Those articles studied chest imaging tests (radiography and/or CT) versus reverse-transcription polymerase chain reaction (RT-PCR) testing to identify coronavirus disease 2019 (COVID-19). However, we believe that some methodologic comments are appropriate.

First, etiologic detection, including nucleic acid detection and antigen detection, can be used as a means to confirm the presence of pathogens, but the detection rate is affected by various factors such as sampling, storage, and reagent performance. Especially in the application of COVID-19 detection, the widely used throat swabs are affected by many factors that limit detection rates, including the immune status of the body, the specificity of the pathogen target organs, and the disease progression.

Second, imaging examinations for COVID-19 help to identify specific disease patterns that generally lack a theoretical basis. Abnormalities at chest radiography in COVID-19 mirror those at CT, demonstrating bilateral peripheral consolidation. Findings at chest radiography have a lower sensitivity than initial RT-PCR testing (69% vs 91%, respectively), whereas a French national survey of 26 hospitals (4824 participants) demonstrated chest CT sensitivity and specificity of 90% and 91%, respectively, in diagnosing COVID-19 pneumonia (2). However, most of those data are on the basis of a population with high disease prevalence (2). For patients in low-prevalence areas or asymptomatic infected persons, imaging tests will face false-positive and missed detection problems.

Finally, some countries around the world are still facing a severe epidemic situation, whereas China seems to have passed the peak of the epidemic. Even so, many countries are increasingly at risk from asymptomatic infections. For asymptomatic infected persons, imaging tests are often negative, and only viral detection can be relied on.

Taken together, imaging examinations have been used as a quick tool to categorize patients into "probably positive" and "probably negative" cohorts. However, rendering a specific diagnosis on the basis of imaging is questionable. Epidemiologic history, clinical symptoms, nonpathogenic laboratory tests, and chest imaging have various advantages for COVID-19 screening under certain conditions. Yet the final diagnosis of COVID-19 infection must be made in combination with viral nucleic acid detection.

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References

1. Ai T, Yang Z, Hou H, et al. Correlation of Chest CT and RT-PCR Testing for Coronavirus Disease 2019 (COVID-19) in China: A Report of 1014 Cases. Radiology 2020;296(2):E32–E40https://doi.org/10.1148/radiol.2020200642.
2. Herpe G, Lederlin M, Naudin M, et al. Efficacy of Chest CT for COVID-19 Pneumonia in France. Radiology 2020. 10.1148/radiol.2020202568. Published online September 1, 2020.
3. Wong HYF, Lam HYS, Fong AH, et al. Frequency and Distribution of Chest Radiographic Findings in Patients Positive for COVID-19. Radiology 2020;296(2):E72–E78https://doi.org/10.1148/radiol.2020201160.
4. Bai HX, Wang R, Xiong Z, et al. Artificial Intelligence Augmentation of Radiologist Performance in Distinguishing COVID-19 from Pneumonia of Other Origin at Chest CT. Radiology 2020;296(3):E156–E165https://doi.org/10.1148/radiol.2020201491.
5. Sardanelli F, Di Leo G. Assessing the Value of Diagnostic Tests in the Coronavirus Disease 2019 Pandemic. Radiology 2020;296(3):E193–E194https://doi.org/10.1148/radiol.2020201845.