

# Imaging in diagnosis and treatment of pulmonary tuberculosis

Sir,

I read with interest the article by Bhalla *et al.*<sup>[1]</sup> and would like to humbly make the following observations:

1. The conventional classification of pulmonary tuberculosis into primary and post-primary based on radiological parameters, which the authors have elucidated, has been questioned by recent genotypic studies.<sup>[2]</sup> Molecular methods of analysis of *Mycobacterium tuberculosis* isolates have revealed that radiological features are often inefficient in differentiating recent from past infection. Thus, the “classical” features of primary and post-primary tuberculosis as indicated by the imaging “pattern” often overlap and cannot indicate the remoteness of infection.
2. In the algorithm for smear-negative pulmonary tuberculosis, as described by the authors, emphasis has been laid on the combination of clinical features and chest radiographs. A systematic review of the combination of clinical parameters and chest x-rays has shown a high sensitivity (median 96%), but low specificity (median 46%) for the diagnosis of pulmonary tuberculosis.<sup>[3]</sup> On the other hand, CT thorax has demonstrated superior specificity (more than 80% even in smear-negative patients with AIDS who have higher incidence of atypical features).<sup>[4]</sup> In the light of the above finding, would it not be prudent to opt for a CT thorax in almost all cases (especially in a secondary/tertiary care setting) in order to rule in or rule out pulmonary tuberculosis? Whether the cost and radiation hazard of CT in these patients can be justified as against the risk of subjecting them to potentially toxic drugs over 6 months or more needs to be validated in future studies.
3. In the diagnostic algorithm for pulmonary tuberculosis, besides chest x-ray and a sputum microscopy, a sputum culture and/or Xpert MTB/RIF is indicated as per the international standards for diagnosis and treatment of tuberculosis. These serve to reasonably confirm a diagnosis of tuberculosis and also may prove indispensable in guiding chemotherapeutic regimens in case of drug-resistant tuberculosis. As much as 20% and 12% cases of pulmonary tuberculosis (as diagnosed by sputum culture) may be missed by sputum microscopy and chest x-ray, respectively. Also, 37% of patients diagnosed to have tuberculosis on the basis of chest x-ray findings may not have the same confirmed by culture. So, sputum culture/Xpert MTB/RIF would serve to increase both the sensitivity and specificity diagnostics

for tuberculosis.

4. In case of radiological worsening for pulmonary/nodal/pleural disease and no definite clinical improvement, the authors have suggested a prolongation of intensive phase which appears to be arbitrary. The cause of such worsening without clinical improvement can be due to a number of factors including drug resistance, paradoxical reaction, secondary infections, alternative diagnosis, etc. Hence, ruling out of the above causes seems more appropriate as also re-confirmation of the diagnosis of tuberculosis. Sputum culture (if sent at the outset) can be of paramount importance in such cases.
5. Finally tuberculosis is a great masquerader. Rare imaging findings like cannon ball shadows, cystic lesions,<sup>[5]</sup> etc., have been reported in tuberculosis. Therefore, no radiological features should be deemed to rule out tuberculosis. Patients having suggestive clinical features should undergo microbiological tests to rule out tuberculosis irrespective of the “atypical” features offered by radiological studies.

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## Conflicts of interest

There are no conflicts of interest.

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## References

1. Bhalla AS, Goyal A, Guleria R, Gupta AK. Chest tuberculosis: Radiological review and imaging recommendations. *Indian J Radiol Imaging* 2015;25:213-25.
2. Jones BE, Ryu R, Yang Z, Cave MD, Pogoda JM, Otaya M, *et al.* Chest radiographic findings in patients with tuberculosis with recent or remote infection. *Am J Respir Crit Care Med* 1997;156:1270-3.
3. Pinto LM, Pai M, Dheda K, Schwartzman K, Menzies D, Steingart KR. Scoring systems using chest radiographic features for the diagnosis of pulmonary tuberculosis in adults: A systematic review. *Eur Respir J* 2013;42:480-94.
4. Feng F, Shi YX, Xia GL, Zhu Y, Lu HZ, Zhang ZY. Computed tomography in predicting smear-negative pulmonary tuberculosis in AIDS patients. *Chin Med J (Engl)* 2013;126:3228-33.
5. Ray A, Suri JC, Sen MK, Khanna A. Cystic lung disease in tuberculosis: An unusual presentation. *Lung India* 2013;30:351-3.

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