J Bras Pneumol. 2020;46(5):e20200457
https://dx.doi.org/10.36416/1806-3756/e20200457

Interstitial lung diseases: the role of HRCT in in the era of antifibrotic therapy

Alfredo Nicodemos Cruz Santana[1,2], Flavia de Souza Nunes Soares[3,4]

Interstitial lung diseases (ILD) typically represent a major challenge for pulmonologists. That challenge has various facets, such as defining the diagnosis, searching for a possible treatment, and deciding what to do if there is an unfavorable response to the initial treatment, especially in the era before antifibrotic agents.[1-6] Therefore, the Brazilian Thoracic Association has always emphasized the proper diagnosis and treatment of ILD, as well as focusing on advances in this field of pulmonology.[7,8]

In the area of ILD, The use of HRCT has come to play an increasingly more important role in the diagnosis of ILD and even in the planning of its treatment. If an HRCT scan shows a pattern consistent with usual interstitial pneumonia (UIP), there is no need for a lung biopsy to define a diagnosis of idiopathic pulmonary fibrosis (IPF), assuming that the clinical and biochemical findings are consistent with the diagnosis.[9] In addition, HRCT is an important tool for the diagnosis of hypersensitivity pneumonitis (HP), as recently stated in one international guideline for clinical practice.[10]

The use of HRCT plays a role in the management of progressive fibrosing ILD (PF-ILD).[3] It is of note that the pattern of findings on HRCT was selected as one of the selection criteria in a study of the use of an antifibrotic agent in the treatment of PF-ILD.[3] The findings should show reticulation with traction bronchiectasis (with or without honeycombing) and an extent > 10%, although additional findings (including ground-glass opacity, a predominance of alterations in the upper lobes or in the peribronchovascular region, mosaic attenuation, air trapping, and centrilobular nodules) were not criteria for exclusion. In addition, an HRCT finding of an increased extent of fibrotic alterations was one of the criteria to define ILD progression despite the initial treatment (i.e., an unfavorable response to previous treatment).

In a study published in the current issue of the *Jornal Brasileiro de Pneumologia*, Almeida et al.[11] evaluated the prevalence of three different patterns of UIP (typical, probable, and indeterminate) and the prognostic role of HRCT in 244 patients with ILD followed at a referral center between January of 2012 and January of 2016. The diagnosis of ILD was based on the clinical, radiological, and histopathological data (surgical lung biopsy was performed in 28.2% of the patients). Of the 244 subjects evaluated, 52.5% were male, 29.1% had a history of smoking, 9.0% had COPD, 29.1% had diabetes, 18.9% had heart disease, and 17.6% had connective tissue disease. In the sample as a whole, the mean FVC was 70% of the predicted value. On HRCT, the typical UIP pattern was observed in 106 patients (most of whom had IPF or HP); the probable UIP pattern was observed in 114 patients (most of whom had connective tissue disease or IPF); and the indeterminate UIP pattern was observed in 24 patients (most of whom had connective tissue disease or desquamative interstitial pneumonia). The mortality rate was higher among the patients with a UIP pattern on HRCT, regardless of age, gender, smoking history, comorbidities, or pulmonary function.[11]

The study by Almeida et al.[11] had some noteworthy limitations. The authors did not evaluate the possible prognostic role of pulmonary function testing during the clinical follow-up period. They were also unable to determine the impact that ILD treatment had on mortality. In addition, the proportion of patients who could be categorized as having PF-ILD, a novel diagnosis of great clinical importance,[3] was not reported.

Although IPF is considered a rare disease, with a prevalence of 0.5-27.9 cases/100,000 population and an incidence of 0.22-8.8 cases/100,000 population, it is a common indication for lung transplantation.[12] That corroborates the impact that IPF has on the prognosis of patients and on the use of highly complex health care services.

In conclusion, the study by Almeida et al.[11] emphasizes the importance of HRCT findings in ILD and shows that the presence of UIP patterns on HRCT shortens survival, regardless of other factors. Therefore, patients with ILD in whom a UIP pattern is seen on HRCT should undergo clinical follow-up evaluations more frequently, should be evaluated more attentively regarding the use of antifibrotics (as in cases of IPF or PF-ILD), and should be considered potential candidates for lung transplantation (especially those with an FVC < 80% of the predicted value or an SpO_2 < 89% during a six-minute walk test).

REFERENCES

1. Richeldi L, du Bois RM, Raghu G, Azuma A, Brown KK, Costabel U, et al. Efficacy and safety of nintedanib in idiopathic pulmonary fibrosis [published correction appears in N Engl J Med. 2015 Aug 20;373(8):782]. N Engl J Med. 2014;370(22):2071-2082.
2. King TE Jr, Bradford WZ, Castro-Bernardini S, Fagan EA, Glaspole I, Glassberg MK, et al. A phase 3 trial of pirfenidone in patients with

1. Hospital Regional da Asa Norte – HRAN – Escola Superior de Ciências da Saúde/Secretaria de Estado da Saúde – ESCS/SES – Brasília (DF) Brasil.
2. Núcleo Avançado de Tórax, Hospital Sírio-Libanês, Brasília (DF) Brasil.
3. Unidade Respiratória, Hospital Universitário Cassiano de Moraes, Universidade Federal do Espírito Santo, Vitória (ES) Brasil.
4. Department of Pharmacovigilance, Pharmaceuticals Product Development (PPD Inc.), Morrisville, NC, USA.

idiopathic pulmonary fibrosis [published correction appears in N Engl J Med. 2014 Sep 18;371(12):1172]. N Engl J Med. 2014;370(22):2083-2092. https://doi.org/10.1056/NEJMoa1402582

3. Flaherty KR, Wells AU, Cottin V, Devaraj A, Walsh SLF, Inoue Y, et al. Nintedanib in Progressive Fibrosing Interstitial Lung Diseases. N Engl J Med. 2019;381(18):1718-1727. https://doi.org/10.1056/NEJMoa1908681
4. Pereira CAC, Baddini-Martinez JA, Baldi BG, Jezler SFO, Rubin AS, Alves RLR, et al. Safety and tolerability of nintedanib in patients with idiopathic pulmonary fibrosis in Brazil. J Bras Pneumol. 2019;45(5):e20180414.
5. Santana AN, Kairalla RA, Carvalho CR. Potential role of statin use in idiopathic pulmonary fibrosis. Am J Respir Crit Care Med. 2008;177(9):1048. https://doi.org/10.1164/ajrccm.177.9.1048
6. Melo NC, Amorim FF, Santana AN. Connecting the dots: hypoxia, pulmonary fibrosis, obstructive sleep apnea, and aging. Am J Respir Crit Care Med. 2015;191(8):966. https://doi.org/10.1164/rccm.201501-0052LE
7. Baldi BG, Pereira CA, Rubin AS, Santana AN, Costa AN, Carvalho CR, et al. Highlights of the Brazilian Thoracic Association guidelines for interstitial lung diseases. J Bras Pneumol. 2012;38(3):282-291.
8. Baddini-Martinez J, Ferreira J, Tanni S, Alves LR, Junior BFC, Carvalho CRR, et al. Brazilian guidelines for the pharmacological treatment of idiopathic pulmonary fibrosis. Official document of the Brazilian Thoracic Association based on the GRADE methodology. J Bras Pneumol. 2020;46(2):e20190423. https://doi.org/10.36416/1806-3756/e20190423
9. Raghu G, Remy-Jardin M, Myers JL, Richeldi L, Ryerson CJ, Lederer DJ, et al. Diagnosis of Idiopathic Pulmonary Fibrosis. An Official ATS/ERS/JRS/ALAT Clinical Practice Guideline. Am J Respir Crit Care Med. 2018;198(5):e44-e68.
10. Raghu G, Remy-Jardin M, Ryerson CJ, Myers JL, Kreuter M, Vasakova M, et al. Diagnosis of Hypersensitivity Pneumonitis in Adults. An Official ATS/JRS/ALAT Clinical Practice Guideline. Am J Respir Crit Care Med. 2020;202(3):e36-e69. https://doi.org/10.1164/rccm.202005-2032ST
11. Almeida RF, Watte G, Marchiori E, Altmayer S, Pacini GS, Barros MC, et al. High resolution computed tomography patterns in interstitial lung disease (ILD): prevalence and prognosis. J Bras Pneumol. 2020;46(5):e20190153.
12. Kaunisto J, Salomaa ER, Hodgson U, Kaarteenaho R, Myllärniemi M. Idiopathic pulmonary fibrosis–a systematic review on methodology for the collection of epidemiological data. BMC Pulm Med. 2013;13:53. https://doi.org/10.1186/1471-2466-13-53