European Journal of Radiology 117 (2019) 219–220

Contents lists available at ScienceDirect

European Journal of Radiology

journal homepage: www.elsevier.com/locate/ejrad

Correspondence

Does mucus impaction represent an uncommon feature of allergic broncho-pulmonary aspergillosis in children?

Dear Editor,

We have read with great interest the recently published article by Sodhi and colleagues [1] related to the evaluation of lung MRI in children with allergic broncho-pulmonary aspergillosis (ABPA). In this study, the diagnostic performance of MRI to detect structural alterations such as central bronchiectasis, mucus plugs and consolidation was performed with CT as Gold Standard. In addition, an evaluation of both hyperattenuating mucus (HAM) [2] at CT and the recently published inverted mucoid impaction signal (IMIS) [3] at MRI was performed, as specific biomarkers of ABPA. This is a valuable study since ABPA is likely to require repetition of imaging and thus, MRI may be beneficial in patients with ABPA to avoid iterative radiation exposures [4].

However, we think that several major points of interest were not discussed. Indeed, many findings were found in disagreement with previous literature and these discrepancies were not mentioned. First, the authors state that both HAM and IMIS should be rare, uncommon findings in children with ABPA because only 1 child was found to have HAM and/or IMIS. Nevertheless, the authors do not discuss that, surprisingly, the prevalence of mucus impaction in general, with or without HAM/IMIS, was found in only 2 lobes of 1/27 patient only (= 7%). Therefore, the rarity of HAM and/or IMIS may be balanced to the general prevalence of mucus impaction, which was found abnormally low as well in this study. Indeed, according to previous literature in asthma, the prevalence of ABPA with mucus impaction was reported more than 45% [2] but not down to 7%.

Second, the authors found an uncommon large amount of patients with normal imaging, the so-called ABPA-S phenotype. Indeed, 17 out of 27 patients (63%) were found to have no abnormality at CT, which is far beyond the expected prevalence of 25%, as previously published [2,5]. Nevertheless, in this study, imaging was performed in patients "referred for the radiological evaluation of ABPA", implying that the diagnosis of ABPA was already done before completion CT and MRI. Indeed, the study design involved ABPA patients only, and thus, children without ABPA were excluded. To be able to exclude children without ABPA, the study design demonstrates that a selection of patients was done before completion of CT and MRI. Thus, the information about the use treatment before imaging is lacking, to potentially explain both an abnormally high prevalence of normal CTs and an abnormally low rate of mucus impactions. Indeed, some refractory asthma may be treated by using corticosteroids. A second option would be that, during the selection process, the use of CT may have been delayed as compared to all other diagnostic criteria needed to be able to select ABPA patients only. Thus, the acute inflammatory part of the disease process may have been missed, owing to the fact that, in ABPA, most of acute imaging features are known to be transient [6], although bronchiectasis constitutes an irreversible and definite scar.

Most of all, we would like to point the fact that, using MRI, the original evaluation of IMIS was done in patients with cystic fibrosis (CF) [4], demonstrating a sensitivity of 92%. A critical difference, in this study, was related to the fact that children did not have CF. Indeed, we can discuss that CF alters the muco-ciliary clearance and thus, we can hypothesize that ABPA-related mucus abnormalities may be prone to cumulate in CF. Moreover CF patients undergo imaging at least once a year. Therefore acute inflammatory manifestations may be detectable earlier than in patients without CF. Indeed, in patients without CF, there is often errancy of the diagnosis at first which is prone to delay the use of imaging by several years [6]. Thus, in patients without CF, imaging may be representative of the late forms of the disease rather than the early inflammatory manifestations. To support this fact, in previous study, IMIS was systematically a precursor for the development of bronchiectasis during follow-up. As illustrated in the study by Sodhi and colleagues, children with CT abnormalities were shown to have already large, extensive, severe areas of bronchiectasis, along with retractile fibrotic changes, showing that ABPA was diagnosed at a late phase of the disease process. Thus, HAM and/or IMIS may have disappeared because of the delayed natural history of the disease and/or because of previous corticosteroid treatments during the selection process versus severe asthma. Longitudinal evaluations should be worth doing to further investigate this point.

In addition, we agree with the authors that conventional T1 and T2 sequences may not be used alone to assess lung morphology confidently. A direct comparison of conventional T1 and T2 sequences versus 3D-UTE MRI has been published [7] and has shown significant improve to detect structural abnormalities with CT as Gold Standard.

Finally, we would like to congratulate the authors to have performed the first study using CT and MRI in children with ABPA and without CF. Interestingly, several findings were found in disagreement with the most recent literature in adults and/or CF conditions, which would need further clarification and longitudinal evaluation. The low rate of mucus impaction, the high rate of normal CTs and the high rate of bronchiectasis without mucus may enhance that, in clinical routine practice, the use of CT and MRI are often delayed from the acute phase of the disease. In this setting, lung MRI may be used to follow-up ABPA early, without any radiation exposure.

Conflict of interest

The authors declare no conflict of interest.

DOI of original article: https://doi.org/10.1016/j.ejrad.2018.12.021

https://doi.org/10.1016/j.ejrad.2019.05.023
Received 31 January 2019
0720-048X/ © 2019 Published by Elsevier B.V.

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