

Reply: Prednisolone plus itraconazole in acute-stage allergic bronchopulmonary aspergillosis complicating asthma: is the benefit worth the risk?

Reply to A. Havette and co-workers:

Copyright ©The authors 2022. For reproduction rights and permissions contact permissions@ersnet.org

Received: 22 Nov 2021 Accepted: 28 Nov 2021 We thank A. Havette and co-workers for the interest shown in our article [1]. They suggest that the benefit of itraconazole–prednisolone combination in allergic bronchopulmonary aspergillosis (ABPA) may be due to the increased bioavailability of inhaled corticosteroids (ICS) resulting from the CYP3A4 inhibition by itraconazole. While theoretically correct, there is no evidence that the interaction with ICS mediates the beneficial effect of itraconazole. Moreover, none of the previous trials of oral triazoles in ABPA have explored this aspect [2–5]. Our recent study suggests that itraconazole is likely beneficial when combined with prednisolone. Whether ICS potentiates this synergy remains to be seen. A. Havette and co-workers further indicate that discontinuing itraconazole and oral steroids at 4 months in the combination arm could have diminished the problem of ICS–itraconazole interaction. We, however, feel that the best study design to investigate the actual effect of prednisolone–itraconazole combination would be to use the combination in ABPA sans asthma, where ICS are not routinely used [6].

A. Havette and co-workers bring up the pertinent issue of an accentuated risk of hypothalamic-pituitaryadrenal axis suppression when adding itraconazole to ICS and oral prednisolone. Unfortunately, in the current study, we did not monitor cortisol levels. We also agree with the concern raised by the authors about azole resistance in *Aspergillus fumigatus* due to prolonged treatment with itraconazole. However, we believe that such resistance is rare when itraconazole is used for shorter courses like in our study. At our centre, the prevalence of azole resistance in *A.fumigatus* is low (1/285 isolates, 0.35%; unpublished data). In conclusion, we believe the benefit of prednisolone–itraconazole is likely to outweigh the risk, especially in those with a higher risk of exacerbation (ABPA with fungal ball, extensive bronchiectasis, and others) [7, 8].



Shareable abstract (@ERSpublications) The benefits outweigh the risks of using combined prednisolone-itraconazole for treating ABPA complicating asthma https://bit.ly/3oyX53I

Cite this article as: Agarwal R, Muthu V. Reply: Prednisolone plus itraconazole in acute-stage allergic bronchopulmonary aspergillosis complicating asthma: is the benefit worth the risk? *Eur Respir J* 2022; 59: 2102989 [DOI: 10.1183/13993003.02989-2021].

Ritesh Agarwal and Valliappan Muthu

Dept of Pulmonary Medicine, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India.

Corresponding author: Ritesh Agarwal (agarwal.ritesh@outlook.in)

Conflict of interest: None declared.

References

- 1 Agarwal R, Muthu V, Sehgal IS, *et al.* A randomised trial of prednisolone *versus* prednisolone and itraconazole in acute-stage allergic bronchopulmonary aspergillosis complicating asthma. *Eur Respir J* 2022; 59: 2101787.
- 2 Stevens DA, Schwartz HJ, Lee JY, *et al.* A randomized trial of itraconazole in allergic bronchopulmonary aspergillosis. *N Engl J Med* 2000; 342: 756–762.
- 3 Wark PA, Hensley MJ, Saltos N, *et al.* Anti-inflammatory effect of itraconazole in stable allergic bronchopulmonary aspergillosis: a randomized controlled trial. *J Allergy Clin Immunol* 2003; 111: 952–957.
- 4 Agarwal R, Dhooria S, Singh Sehgal I, *et al.* A randomized trial of itraconazole *vs* prednisolone in acute-stage allergic bronchopulmonary aspergillosis complicating asthma. *Chest* 2018; 153: 656–664.

- 5 Agarwal R, Dhooria S, Sehgal IS, *et al.* A randomised trial of voriconazole and prednisolone monotherapy in acute-stage allergic bronchopulmonary aspergillosis complicating asthma. *Eur Respir J* 2018; 52: 1801159.
- 6 Muthu V, Sehgal IS, Prasad KT, *et al.* Allergic bronchopulmonary aspergillosis (ABPA) sans asthma: a distinct subset of ABPA with a lesser risk of exacerbation. *Med Mycol* 2020; 58: 260–263.
- 7 Agarwal R, Aggarwal AN, Garg M, *et al.* Allergic bronchopulmonary aspergillosis with aspergilloma: an immunologically severe disease with poor outcome. *Mycopathologia* 2012; 174: 193–201.
- 8 Agarwal R, Khan A, Gupta D, *et al.* An alternate method of classifying allergic bronchopulmonary aspergillosis based on high-attenuation mucus. *PLoS ONE* 2010; 5: e15346.