

Thunderstorm asthma in seasonal allergic rhinitis: The TAISAR study

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Background

Asthma epidemics associated with thunderstorms have had catastrophic effects on individuals and emergency services. Seasonal allergic rhinitis (SAR) is present in the vast majority of people who develop thunderstorm asthma (TA), but there is little evidence regarding risk factors for TA among the SAR population.



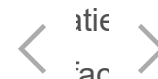
We sought to identify risk factors for a history of TA and hospital presentation in a cohort of individuals with SAR.

Methods

This multicenter study recruited adults from Melbourne, Australia, with a past diagnosis of TA and/or self-reported SAR. Clinical information, spirometry results, white blood cell count, ryegrass pollen-specific (RGP-sp) IgE concentration, and fractional exhaled nitric oxide were measured to identify risk factors for a history of TA in individuals with SAR.

Results

From a total of 228 individuals with SAR, 35% (80 of 228) reported SAR only (the I-SAR group), 37% (84 of 228) reported TA symptoms but had not attended hospital for treatment (the O-TA group), and 28% (64 of 228) had presented to the hospital for TA (the H-TA group). The O-TA and H-TA groups reported a previous asthma diagnosis. Logistic regression analysis



associated with O-TA and H-TA indicated that lower FEV₁ value and an Asthma Control Questionnaire score higher than 1.5 were associated with H-TA. Higher blood RGP-sp IgE concentration, eosinophil counts, and fractional exhaled nitric oxide level were significantly associated with both O-TA and H-TA. Receiver operating curve analysis showed an RGP-sp IgE concentration higher than 10.1 kU/L and a prebronchodilator FEV₁ value of 90% or lower to be biomarkers of increased H-TA risk.

Conclusion

Clinical tests can identify risk of a history of TA in individuals with SAR and thereby inform patient-specific treatment recommendations.

Key words

[Asthma](#) • [thunderstorm](#) • [epidemic](#) • [seasonal allergic rhinitis](#) • [ryegrass pollen](#) • [specific IgE](#) • [spirometry](#) • [ACQ](#)

Abbreviations used:

[Feno](#) (Fractional exhaled nitric oxide), [H-TA](#) (Hospitalized with thunderstorm asthma), [ICS](#) (Inhaled corticosteroid), [I-SAR](#) (Isolated seasonal allergic rhinitis (seasonal allergic rhinitis



[RGP-sp](#) (Ryegrass pollen-specific), [ROC](#) (Receiver operating characteristic), [SABA](#) (Short-acting β -agonist), [SAR](#) (Seasonal allergic rhinitis), [SNOT-22](#) (22-Item Sino-Nasal Outcome Test), [TA](#) (Thunderstorm asthma), [TAISAR](#) (Thunderstorm Asthma in Seasonal Allergic Rhinitis)

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