

# ALLERGY Net

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## Thunderstorm-related asthma epidemic owing to *Olea Europaea* pollen sensitization

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Associations between thunderstorm and asthma morbidity have been reported in several countries. Common to all epidemics of thunderstorm-related asthma is a significant increase in atmospheric allergen load during and immediately after a thunderstorm (1). It is known that pollen grains or spores are ruptured during thunderstorm by osmotic shock, releasing small particles able to reach distal airways (2). Sensitization to *Alternaria* species or to grass and parietaria pollens has been suggested to play a key role in thunderstorm-related asthma. The only reported event of thunderstorm-related asthma in Mediterranean area was attributed to sensitization to parietaria pollen (3).

Here, we describe a series of 20 patients (age:  $44 \pm 18$ , range: 9–81, eight women) who presented to Emergency Department in Barletta (94 000 inhabitants), Puglia, Italy, for sudden and severe asthmatic symptoms between May 27th 3 PM and 28th 5 AM 2010, immediately after a violent thunderstorm that occurred following a very hot morning (mean temperature: 29°C). All subjects were outdoors when the thunderstorm struck.

It is noteworthy that in May and June of the same year, two to three patients per day, on average, needed emergency department care for asthma (Fig. 1).

All patients underwent allergological work-up that included skin prick tests and a careful assessment of clinical history. Twelve patients had a known allergic rhinitis, of them six were associated with asthma, but only two patients were regularly on anti-asthmatic treatment (inhaled corticosteroids associated with

long-acting beta-2-agonist). All patients were sensitized to olive tree (*Olea europaea*) pollen, of whom seven were monosensitized, while ten patients were also sensitized to grass, seven to parietaria, five to compositae, five to cypress, five to house dust mites, three to dog and one to cat danders. No patient was sensitized to *Alternaria*. Mean pollen count was 278 granules/m<sup>3</sup> for olive pollen. It is noteworthy that similar and even higher pollen concentration had been reported in different days of the same period without an increase in emergency department admissions for asthma (Fig. 1).

This is, to our knowledge, the second epidemic of thunderstorm-related asthma described in Mediterranean area and the first one in which sensitization to *O. europaea* pollen played a key role. Interestingly, it has been recently described that olive tree aeroallergen levels correlate with asthmatic symptoms better than pollen count (4),

**This is the first report of thunderstorm-related asthma owing to olive tree pollen sensitization. Allergic patients should be informed of the risk of severe asthma attack during thunderstorms.**

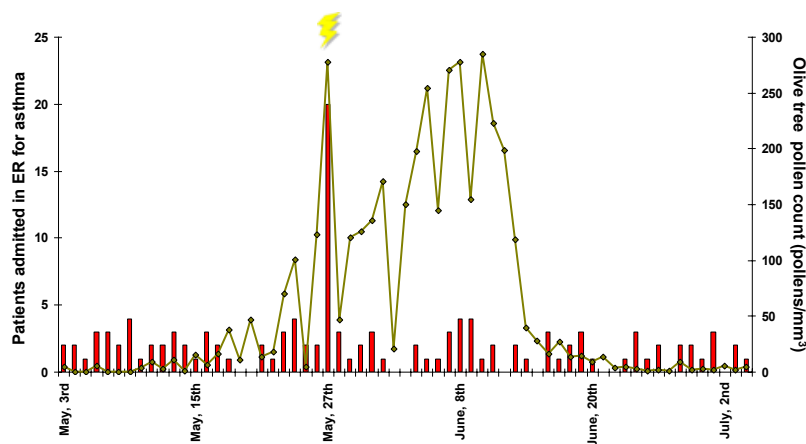


**Figure 1** number of patients admitted to emergency department for asthma between 3 May and 4 July 2010 and olive tree pollen count in the same period. The thunderbolt-arrow indicates the day of thunderstorm.

strengthening the hypothesis that thunderstorms may determine the release of small particles (aeroallergens) able to induce sudden symptoms of asthma in sensitized patients and possibly explaining the apparent discordance between high pollen counts in days in which there were no thunderstorm and low emergency department admissions for asthma.

#### Author contributions

Dr. Laura Losappio performed allergy consultations of studied patients and collected data; Dr. Francesco Contento and Dr. Cosimo Cannito visited patients in Emergency Department and collected first clinical data; Dr. Enrico Heffler and Prof. Giovanni Rolla interpreted

clinical data and collected aerobiological data. All authors contributed to manuscript writing and revision.

#### Conflict of interest

No conflicts of interest to declare.

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#### References

1. Marks GB, Bush RK. It's blowing in the wind: new insights into thunderstorm-related asthma. *J Allergy Clin Immunol* 2007;**120**:530–532.
2. Suphioglu C, Singh MB, Taylor P, Bellomo R, Holmes P, Puy R et al. Mechanism of grass-pollen-induced asthma. *Lancet* 1992;**339**:569–572.
3. D'Amato G, Cecchi L, Liccardi G. Thunderstorm-related asthma: not only grass pollens and spores. *J Allergy Clin Immunol* 2008;**121**:537–538.
4. Brito FF, Gimeno PM, Carnés J, Martín R, Fernández-Caldas E, Lara P et al. *Olea europaea* pollen counts and aeroallergen levels predict clinical symptoms in patients allergic to olive pollen. *Ann Allergy Asthma Immunol* 2011;**106**:146–152.