Thunderstorm asthma

It seems reasonable to think that rain would relieve allergic rhinitis (hay fever) and asthma triggered by pollen by washing pollen out of the air. This is incorrect as heavy rain often makes some people get worse. Epidemics of thunderstorm asthma have been described in Melbourne, Wagga and London. Here’s why.

**Around 1 in 4 people with allergic rhinitis also have asthma**

Some people with severe allergic rhinitis think that their allergic rhinitis turns into asthma or will make them tight in the chest or wheeze. This is incorrect as pollen can trigger asthma as well as allergic rhinitis symptoms.

**Grass pollen can be wind-blown for long distances**

Pasture grasses rely on the wind to distribute their pollen. A single hectare of ryegrass, for example, will release hundreds of kilograms of pollen per season. The concentration of pollen will be highest nearest its source, but high-speed winds will distribute pollen grains over long distances.

Not all allergen, however, is contained within intact pollen grains. Other allergen-carrying particles (as small as 0.1 um diameter) can carry grass and tree allergens. Unlike most intact pollen grains (generally 2-60 um diameter), these smaller particles are capable of reaching the small airways of the lung and triggering asthma attacks.

These particles may come from fragments of pollen grains, from plant sap (such as that released from grass blades when mowing the lawn) or the decay of plant material. Some of them might even be derived from the sticking of allergen to particles of atmospheric pollution.

**Thunderstorms and weather changes can trigger asthma attacks**

An explanation for so-called thunderstorm asthma epidemics in Melbourne, Wagga and London has been found in recent studies that describe how allergen can be released into the atmosphere.

Some grass allergen (like ryegrass allergen Lol pIX) is located on the surface of starch granules within pollen grains. A single pollen grain contains up to 700 starch granules of 0.6 to 2.5 um (small enough to reach the lower airways in the lung). When it rains or is humid, pollen grains can absorb moisture and burst, releasing hundreds of small allergenic particles that can penetrate deep into the small airways of the lung.

Not everyone who gets thunderstorm asthma has had it before. They have normally had severe pollen allergic rhinitis and most have been found to be allergic to ryegrass. Presumably the massive load of small allergenic particles being inhaled straight into the lung trigger these attacks.

**Pollen asthma can be treated effectively**

Appropriate management of chronic pollen asthma (which probably has a similar mechanism to thunderstorm asthma) includes commencing anti-inflammatory (preventer) asthma medication. This can be given preventatively or with the first wheeze in Spring. Some patients undergoing allergen immunotherapy (desensitisation) for their allergic rhinitis find that their seasonal asthma improves as well. So if you wheeze during Spring, see your doctor for appropriate advice.

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Further information


Sydney, Melbourne, Canberra and Brisbane pollen count websites and apps are available at:


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