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Perspective

Global Warming's Impact on Common Allergies

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PERSPECTIVE

Longer pollination seasons and more frequent thunderstorms, sandstorms, and other harsh weather events are all consequences of global warming. Pollens, moulds, and fungus proliferate more quickly as temperatures rise, carbon dioxide levels in the atmosphere rise, rainfall increases, and humidity rises. This produces allergen-carrying biological aerosols in the atmosphere, resulting in allergic illness epidemics in many nations.

Sandstorms, also known as dust storms, are a meteorological phenomenon that occurs more frequently as a result of global warming, in which small particles of less than 100 microns can remain airborne for days, causing asthma, pneumonia, allergic rhino conjunctivitis, cardiovascular, and cerebrovascular diseases.

Rising temperatures cause more severe rains, frequent storms, and a gradual rise in sea levels, resulting in increased flood frequency and duration, worsening surface wear on buildings. Mold growth may be accelerated in our interior environment as a result of these factors. Home dampness and respiratory symptoms, including asthma, have a strong and constant dose-response association, implying a causative relationship. Cockroaches and house dust mites enjoy warm, humid settings. House dust mite sensitization is more common in temperate and tropical climates, and is linked to allergic rhinitis, allergic conjunctivitis, asthma, and eczema. Nonetheless, there are considerable differences between tropical and temperate locales in certain house dust mite components that cause allergy disorders. Cockroach allergy is a common cofactor in allergic rhinitis, asthma, and eczema, with a varied pattern of sensitization even within the same climatic zones.

Warmer average temperatures have been linked to an increased prevalence of asthma. In a research conducted in New Zealand, a 1°C increase in mean temperature was linked to a 1% increase in asthma prevalence. A greater mean temperature was also associated with an increased prevalence of asthmatic attacks in an Italian study that evaluated two regions with Mediterranean and subcontinental climates, respectively. The International Study of Asthma and Allergies in Children (ISAAC), on the other hand, found no link between mean outdoor temperatures and asthma prevalence. The ISAAC study, however, was not meant to look at the effects of temperature change in distinct subregions.

The growing recognition of thunderstorm asthma is due to the increased frequency of thunderstorms and extreme weather conditions caused by global warming. Thunderstorm asthma is a distinct condition that affects many people who have never had asthma before. Pollen seasons are the most common time for it to happen. Thunderstorm asthma epidemics have been documented in numerous nations across the world, including the United States, the United Kingdom, Australia, and Europe. The most concerning instance was the current epidemic in Melbourne, Australia, on November 21, 2016, which resulted in eight deaths. Thunderstorm asthma was linked to a 432% increase in emergency medical attendances for acute respiratory distress symptoms on that evening, an 82% increase in the incidence of out-of-hospital cardiac arrest, and a 41% increase in prehospital deaths on the same evening of the storm, according to a time series analysis published in the British Medical Journal. Grass pollens are thought to have erupted during the thunderstorm, resulting in pollen pieces reaching the lower respiratory system and causing bronchoconstriction. When those pollens were ruptured by osmotic force, allergenic glycoproteins were liberated in the form of minute respirable particles, which were distributed over hundreds of kilometres.

Extreme weather conditions have been linked to asthma-related hospitalizations. During extreme weather circumstances such as high humidity high temperature weather, low humidity low temperature weather, and times of high ozone levels, a recent time series revealed an increase in asthma-related hospitalisation. Another recent study found that the size of the diurnal temperature variation was linked to an increase in asthma exacerbation-related hospitalizations.

In a time series done in Shanghai, China, out-patient clinic visits for allergic conjunctivitis were found to be substantially linked with higher levels of nitrous oxide, ozone, and temperature. Air pollution, both indoor and outdoor, has long been recognised as a significant environmental risk factor for allergic rhino conjunctivitis. Tobacco smoke, products of fossil fuel burning, dust in the Asian region, and phthalates are all associated air pollutants. These air pollutants are thought to be allergic, irritating, or a combination of both.

In studies throughout the Pacific rim, the prevalence of physician-diagnosed allergic rhinitis was positively linked with warmer temperatures (odds ratio=1.1, 95% confidence interval=1.02-1.19).

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Although studies employing ISAAC data revealed some regional connections in various age groups and locations, these findings were inconsistent and did not conclusively support the correlation.

According to the US National Health and Nutrition Examination Survey, increased pollen sensitisation has been linked to global warming, with at least a two-fold increase in the incidence of pollen sensitisation to perennial rye grass and ragweed between 1976 and 1988. In Canada, similar findings were discovered.

There have been no studies specifically focusing on a link between urticaria and global warming, though a few anecdotal reports have found that during high temperatures associated with global warming, patients tended to wear less clothing, resulting in more light exposure, which exacerbated their solar urticaria. There is no documented link between mean outdoor temperature and the occurrence of eczema.