



Histamine Releasing Factors in Severe Asthma and Rhinovirus Associated Asthma Exacerbations

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DESCRIPTION

Asthma, a chronic respiratory condition, affects millions of people worldwide, causing significant morbidity and reducing the quality of life for sufferers. Characterized by recurrent episodes of wheezing, coughing, chest tightness, and shortness of breath, asthma is a complex condition with multifaceted causes. In this article, we delve into the underlying factors that contribute to the development and exacerbation of asthma. By understanding these causes, we can strive for better prevention and management strategies to alleviate the burden of this prevalent disease. Asthma has long been recognized as having a strong genetic component. Studies have indicated that individuals with a family history of asthma are more likely to develop the condition. Numerous genes have been associated with asthma susceptibility, including those involved in immune regulation and lung function. However, the precise interactions between these genetic factors and environmental triggers remain an area of active research. Allergens play a pivotal role in triggering asthma symptoms, especially in individuals with allergic asthma. Common allergens include house dust mites, pollen, pet dander, mold spores, and cockroach droppings. When exposed to these substances, susceptible individuals may experience an immune response characterized by airway inflammation and constriction. Ambient air pollution, both outdoor and indoor, has emerged as a significant risk factor for asthma. Fine particulate matter, nitrogen dioxide, ozone, and volatile organic compounds are among the pollutants implicated in asthma development. These pollutants can irritate the airways, trigger inflammation, and impair lung function, particularly in urban areas with high pollution levels. Occupational asthma results from exposure to various substances in the workplace, such as

chemicals, dust, gases, and fumes. Certain professions, including manufacturing, agriculture, healthcare, and construction, carry a higher risk of developing occupational asthma. Examples of known occupational asthma triggers include flour dust, latex, isocyanates, and cleaning agents. Both active smoking and exposure to second-hand smoke have detrimental effects on respiratory health. Children exposed to tobacco smoke are particularly vulnerable to developing asthma, with evidence suggesting that maternal smoking during pregnancy increases the risk of asthma in offspring. The toxic chemicals present in tobacco smoke can inflame the airways and disrupt normal lung function. Respiratory infections, especially viral infections, can act as triggers for asthma exacerbations. Rhinoviruses, Respiratory Syncytial Virus (RSV), and influenza viruses are known to exacerbate asthma symptoms. These infections provoke an inflammatory response in the airways, leading to bronchial hyperresponsiveness and airway obstruction. Moreover, early-life respiratory infections have been associated with an increased risk of developing asthma later in life. The prevalence of asthma is higher among individuals who are overweight or obese. The underlying mechanisms linking obesity and asthma are not fully understood, but several factors are thought to contribute. Adipose tissue produces pro-inflammatory cytokines that can promote airway inflammation and bronchial hyperactivity. Additionally, obesity alters lung mechanics and reduces respiratory muscle strength, compromising lung function. Exposures during the critical early-life period can significantly influence the development of asthma. Maternal factors, such as maternal smoking, diet, and stress, have been implicated in asthma risk in children. Furthermore, prenatal exposure to air pollutants and allergens can impact fetal lung development and immune function, predisposing offspring to asthma.

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Psychological factors, including stress, anxiety, and depression, have been associated with asthma incidence, severity, and treatment outcomes. Stress can modulate immune responses and worsen airway inflammation, potentially triggering asthma symptoms. Moreover, psychological distress may influence medication adherence and self-management behaviours, affecting overall asthma control. Asthma is a complex respiratory condition influenced by a myriad of genetic, environmental, and

lifestyle factors.

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CONFLICT OF INTEREST

The author's declared that they have no conflict of interest.