Workers' Comp

Ask The Pharmacist: Asthma and Smoke Inhalation Treatments

February 3, 2025
5 MIN READ
Author profile image

Cameron Hannum, Pharm.D.

Sr. Clinical Account Pharmacist

What are the management strategies for conditions like asthma and smoke inhalation injuries?

Asthma is a common chronic respiratory disease that leads to difficulty breathing due to the presence of inflammation and bronchoconstriction. It's often triggered by allergens, irritants or infections and in some occupational settings, employees may develop asthma or experience exacerbations because of airborne irritants, such as smoke or certain chemical agents (e.g., ash, pesticides, mineral dust, sawdust, etc.). The treatment of asthma focuses on controlling inflammation, preventing bronchospasm and minimizing exposure to environmental triggers.

Pharmacologic Therapy for Asthma Management

One of the cornerstones of asthma management is pharmacologic therapy, which is divided into long-term control therapies and rescue medications. Inhaled corticosteroids (ICS) are the most effective long-term control medications for asthma. Commonly prescribed ICS include budesonide and fluticasone as standalone or in combination meter-dose inhalers (MDIs). They reduce inflammation in the airways, decreasing the frequency and severity of asthma attacks. Leukotriene modifiers (e.g., montelukast) are guideline recommended to help reduce inflammation and prevent bronchoconstriction by blocking leukotrienes, which are chemicals involved in the inflammatory process.

For severe asthma, biologics like Xolair (generic/chemical name: omalizumab, an anti-IgE antibody) or Fasenra (generic/chemical name: benralizumab, IL-5 agonist) may be used to target specific pathways in the immune response that contribute to asthma symptoms. These meds tend to carry 'specialty' designation and often come at a much higher therapeutic cost. For rescue therapy, bronchodilators (beta-agonists) are the mainstay of therapy. These medications help open the airways by relaxing the muscles surrounding them. Short-acting beta-agonists

(SABAs), such as albuterol, are used for rescue and quick relief of acute symptoms, while long-acting beta-agonists (LABAs), like salmeterol, are used as part of maintenance or step-up therapy treatment protocols typically in combination with ICS therapies.

Lifestyle and Environmental Management for Asthma

In addition to medications, lifestyle and environmental factors play a significant role in managing asthma. Identifying and avoiding environmental triggers such as tobacco or vape smoke, allergens and pollution is crucial. For workers exposed to smoke in the workplace, wearing personal protective equipment (PPE), such as respirators, can help with exposures. Pulmonary rehabilitation that includes exercise plus education to improve lung function, particularly in those suffering from chronic asthma, can greatly improve overall respiratory health as well.

Smoke inhalation occurs when toxic substances in smoke are breathed in, potentially leading to serious respiratory damage. These types of injuries can cause immediate harm to the upper and lower respiratory tract, as well as systemic effects due to absorption of toxic gases, like carbon monoxide (CO) or cyanide, found in fire smoke due to the composition of many, mainly older, domestic furnishings and building materials. The treatment of smoke exposure aims to decrease airway damage, manage symptoms and ultimately prevent complications such as infection and long-term pulmonary disease.

Immediate Management of Smoke Inhalation

The primary goal in the immediate management of smoke inhalation is to provide oxygen therapy to ensure the injured employee receives enough oxygen, for exposure to smoke often leads to decreased oxygen levels due to the displacement of oxygen by CO and other gases. This is done by administering 100% oxygen via a non-rebreather mask to get oxygen levels back to where they need to be in the blood. For severe cases, hyperbaric oxygen therapy (HBOT) may be employed to increase elimination of gases like CO from the body and improve oxygenation more effectively.

Other medications may be given depending on the severity of exposure and any toxins that may have been involved. Where smoke inhalation leads to wheezing or difficulty breathing, bronchodilators (inhaled beta-agonists) such as the SABAs (e.g., albuterol) can help relieve bronchoconstriction and improve airflow within the lungs. Corticosteroids can be administered to reduce inflammation in the airways due to smoke exposure, this includes the previously mentioned ICS formulations, but also systemic corticosteroids that are taken orally (e.g., prednisone). These are typically given in more severe cases to manage symptoms like swelling and irritation of the airways to improve breathing. If the individual was exposed to toxins like cyanide (often a result of burning synthetic materials), antidotes like hydroxocobalamin or sodium thiosulfate may be used to counteract the effects of the poisoning.

Long-Term Management and Monitoring

As with asthma, ongoing management may involve pulmonary rehabilitation programs. This can benefit those exposed to improving lung function, reducing symptoms and enhancing quality of life. Long-term monitoring would be required for complications that may arise such as pulmonary fibrosis, chronic obstructive pulmonary disease (COPD) and asthma, which all may develop after severe or repeated exposure to smoke.

Asthma and smoke inhalation injuries are significant respiratory concerns, particularly in high-risk occupational environments. Treating asthma typically involves the use of bronchodilators, corticosteroids, and, in severe

cases, biologics. For smoke inhalation injuries, treatment focuses on oxygen therapy, bronchodilators, corticosteroids, and, when necessary, antidotes to counteract specific toxins. When both conditions occur together, a comprehensive treatment plan is essential to effectively manage symptoms and support recovery.

Workers' compensation programs play a crucial role in supporting affected individuals, though navigating claims and proving causation can be challenging. Accurate medical documentation, detailed exposure histories, and proactive preventive measures are vital for addressing the needs of employees and improving outcomes for those suffering from asthma or smoke-related injuries in the workplace.

This information is meant to serve as a general overview, and any specific questions should be fully reviewed with a health care professional such as the prescribing doctor or dispensing pharmacist.

Do you have a workers' compensation or auto-related pharmacy question? Send us an email at AskThePharmacist@enlyte.com.

To read more Ask The Pharmacist articles, please visit enlyte.com/ask-the-pharmacist.

References:

https://www.aafp.org/pubs/afp/issues/2021/1100/p446.html

https://pubmed.ncbi.nlm.nih.gov/39421468/

https://reference.medscape.com

https://pmc.ncbi.nlm.nih.gov/articles/PMC7066608/#:~:text=Although%20carbon%20monoxide%20poisoning%20rema

https://pmc.ncbi.nlm.nih.gov/articles/PMC2722076/

https://www.ncbi.nlm.nih.gov/books/NBK470531/

https://www.sciencedirect.com/science/article/pii/S0162013423003355

mitchell | genex | coventry