

Asthma exacerbations: Triggers, management, personalization.

Robert H. Jenkins*

School of Clinical Medicine, University of Melbourne, Australia

Introduction

Understanding asthma necessitates a deep dive into its triggers, the mechanisms of exacerbation, and effective management strategies. Here's the thing about asthma: respiratory viral infections, especially common ones like rhinovirus and influenza, are undeniably major culprits for exacerbations. This article really dives into the immunological processes behind these triggers, giving us a clearer picture of how to manage these events and where we might focus future treatments. Unpacking the specific immune responses to these viruses can guide targeted interventions, potentially mitigating the frequency and severity of asthma flare-ups [1].

When someone's having an acute asthma attack, giving them oxygen needs a bit of finesse. Administering too little oxygen can lead to hypoxia, but too much can paradoxically cause harm in certain situations. This review emphasizes that we must carefully titrate oxygen to avoid both scenarios, really drilling down into the target saturation ranges and the physiological reasons behind careful administration in adults. Understanding the delicate balance of oxygen delivery is paramount to ensuring patient safety and optimal recovery during critical asthma episodes [2].

This systematic review gives us a clear picture of how bacterial infections, particularly those less common 'atypical' bacteria, play a significant role in severe asthma. What this really means is they contribute to both acute flare-ups and the ongoing progression of the disease, making their identification crucial. Early and accurate detection of these bacterial co-infections can profoundly impact treatment decisions, potentially preventing long-term damage and improving overall disease control for patients with severe asthma [3].

This updated review sheds light on the complex relationship between asthma and COVID-19. The emergence of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) brought new challenges for respiratory patients, and this article explains how the infection can affect asthma control and disease severity. It offers practical recommendations for managing asthma patients effectively through the ongoing pandemic, considering both the direct effects of the virus and the broader implications for healthcare delivery and patient education [4].

For severe asthma patients, allergic bronchopulmonary aspergillosis (ABPA) is a fungal complication we often see. This serious condition can significantly worsen asthma control and lead to permanent lung damage if not addressed promptly. This review breaks down its diagnosis, how it presents clinically, and why it's so important to get in there quickly with antifungal drugs and corticosteroids. Recognizing the signs and symptoms of ABPA is key to initiating timely and effective therapeutic interventions, thereby preserving lung function and improving patient outcomes [5].

Beyond acute care, managing chronic respiratory conditions sometimes requires long-term support. This review covers the ins and outs of long-term oxygen therapy for chronic respiratory diseases. It's about knowing when to use it, the clear benefits for quality of life and survival in hypoxemic patients, and frankly, the ongoing debates and areas where we need more clarity. Proper patient selection and continuous monitoring are essential to maximize the therapeutic benefits while minimizing potential risks associated with prolonged oxygen use [6].

We're constantly looking for better ways to predict asthma exacerbations, especially those linked to infections. Early prediction can enable proactive interventions, potentially preventing severe episodes. This comprehensive review highlights various biomarkers – from inflammatory indicators to genetic markers – that show real promise, ultimately pushing us towards more personalized treatment plans. Identifying reliable biomarkers could revolutionize how we risk-stratify patients and tailor preventive strategies, moving beyond a one-size-fits-all approach [7].

Using inhaled corticosteroids for asthma comes with a known risk: oral candidiasis, a common fungal infection. While these medications are cornerstones of asthma management, understanding and mitigating their side effects is important. This systematic review and meta-analysis really drives home the link and, critically, emphasizes that good inhaler technique and rinsing your mouth after use are simple, yet powerful ways to reduce this infection risk. Educating patients on these simple practices can significantly enhance adherence and minimize complications [8].

Let's break down how we're using immunomodulatory therapies for severe asthma. These advanced treatments offer new hope for pa-

*Correspondence to: Robert H. Jenkins, School of Clinical Medicine, University of Melbourne, Australia. E-mail: robert.jenkins@meduniv.au

Received: 03-Mar-2025, Manuscript No. AAJPCR-25-192; Editor assigned: 05-Mar-2025, Pre QC No. AAJPCR-25-192 (PQ); Reviewed: 25-Mar-2025, QC No. AAJPCR-25-192; Revised: 03-Apr-2025, Manuscript No. AAJPCR-25-192 (R); Published: 14-Apr-2025, DOI: 10.35841/ajpcr-8.2.192

tients who don't respond adequately to conventional therapies. This article reviews current biologic treatments, explaining their mechanisms and how they effectively reduce exacerbations, including those triggered by infections, ultimately improving overall asthma control. It also touches on what's coming next, hinting at future innovations that could further refine targeted therapies and transform the landscape of severe asthma management [9].

Finally, environmental factors play an undeniable role in asthma severity. This systematic review connects the dots between air pollution exposure and asthma exacerbations. What it really means is that dirty air doesn't just irritate the lungs; it makes people more vulnerable to respiratory infections, which then piles on and makes asthma much worse. It's a critical environmental factor we can't ignore, underscoring the importance of public health initiatives and individual protective measures to improve air quality and reduce asthma burden [10].

Conclusion

Asthma exacerbations are a significant concern, frequently triggered by respiratory viral infections like rhinovirus and influenza, which involves specific immunological processes. Bacterial infections, particularly atypical ones, also play a crucial role in severe asthma, contributing to both acute flare-ups and disease progression. Fungal complications, such as Allergic Bronchopulmonary Aspergillosis (ABPA), are common in severe asthma and require prompt treatment with antifungals and corticosteroids. Environmental factors like air pollution are also critical, as dirty air not only irritates the lungs but increases vulnerability to respiratory infections, worsening asthma.

Managing these exacerbations involves careful approaches. For acute attacks, precise titration of oxygen therapy is essential to maintain target saturation ranges and avoid adverse effects. Long-term oxygen therapy is also vital for chronic respiratory conditions, offering benefits for quality of life and survival in hypoxemic patients, though some debates persist.

Pharmacological interventions include inhaled corticosteroids, which, while effective, carry a risk of oral candidiasis; proper in-

haler technique and mouth rinsing are key preventive measures. Immunomodulatory therapies, including current biologic treatments, are proving effective in reducing exacerbations, even those triggered by infections, thereby improving overall asthma control. The ongoing COVID-19 pandemic presents another layer of complexity, with Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) infection impacting asthma control and severity, necessitating specific management recommendations. To further personalize treatment, researchers are identifying promising biomarkers – inflammatory and genetic – to better predict asthma exacerbations, especially those linked to infections. This collective understanding helps in managing the multifaceted nature of asthma and its various triggers and complications.

References

1. David JJ, Sunit L, James EG. *Respiratory Viral Infections and Asthma Exacerbations*. *Clin Chest Med*. 2020;41:651-663.
2. Filipe P, Ana SCF, João F. *Oxygen therapy in adult asthma exacerbations*. *Breathe* (Sheff). 2023;19:220261.
3. Zeinab J, Nada AS, Rasha AK. Bacterial infections in severe asthma: A systematic review. *World Allergy Organ J*. 2020;13:100473.
4. Garima A, Sanjeev M, Khushbu S. Asthma and COVID-19: An Updated Review. *Lung*. 2022;200:707-717.
5. Ritesh A, M.R. S, Vijeth B. Allergic bronchopulmonary aspergillosis in severe asthma: a narrative review. *J Asthma Allergy*. 2020;13:595-604.
6. Laura GS, Eva N, Ramón M. Long-term oxygen therapy for chronic respiratory diseases. *Arch Bronconeumol*. 2020;56:115-121.
7. Mariam AA, Sharifa AM, Masooma AB. Biomarkers for predicting asthma exacerbations: a comprehensive review. *J Asthma*. 2021;58:1421-1430.
8. Rasha AQ, Abdullah AH, Fatma AJ. Inhaler use and risk of oral candidiasis in patients with asthma or COPD: a systematic review and meta-analysis. *J Asthma*. 2022;59:707-717.
9. Celeste P, William WB, Kian FC. Immunomodulatory therapies in severe asthma: current status and future perspectives. *Eur Respir J*. 2020;56:2002347.
10. Pablo O, Nancy Q, María RB. Air pollution and asthma exacerbations: a systematic review. *Environ Res*. 2020;191:110034.

Citation: Jenkins RH. Asthma exacerbations: Triggers, management, personalization. *J Pulmonol Clin Res*. 2025;08(02):192.