Asthma management: Objective assessment and personalized therapy.

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Introduction

Managing adult asthma involves a comprehensive approach, where objective assessments are key for diagnosis and continuous monitoring. Pulmonary function tests (PFTs) are essential tools for guiding treatment decisions and personalizing patient care [1].

Bronchodilators, particularly long-acting beta-agonists (LABAs) combined with inhaled corticosteroids (ICS), are central to achieving and maintaining asthma control. The strategy is guided by symptom severity and PFT results, aiming for both symptomatic relief and functional improvements to prevent exacerbations [1].

A systematic review highlights the effectiveness and safety of long-acting bronchodilators, including LABAs and long-acting muscarinic antagonists (LAMAs), for stable asthma management. These agents, especially in combination with ICS, significantly improve lung function, reduce exacerbations, and enhance asthma control compared to placebo or monotherapy, reinforcing their crucial role in long-term care and preventing disease progression [2].

The Global Initiative for Asthma (GINA) 2021 report brings key updates, notably shifting away from short-acting beta-agonists (SABAs) as monotherapy. It promotes inhaled corticosteroid-formoterol as the preferred reliever for many patients. The report emphasizes assessing asthma control through both symptoms and objective measures like PFTs, guiding the escalation or de-escalation of therapy and underscoring a personalized, risk-stratified approach [3].

For patients with severe asthma whose condition remains inadequately controlled on dual therapy, triple therapy—combining an inhaled corticosteroid, a LABA, and a LAMA—shows promise. This approach can further improve lung function, reduce exacerbation rates, and enhance asthma control, particularly in individuals with overlapping asthma and Chronic Obstructive Pulmonary Disease features. Careful patient selection and monitoring, with PFTs playing a key role, are crucial for assessing treatment response [4].

A study examining factors influencing asthma control in adults reveals that adherence to maintenance therapy and appropriate bronchodilator use are critical determinants. While not exclusively focused on PFTs, this research highlights the multifaceted nature of control, where medication strategies directly influence clinical outcomes. It suggests that enhanced patient education and adherence support are vital for optimizing asthma management and achieving desired control levels [5].

Spirometry, a primary pulmonary function test, plays a crucial role in the diagnosis, assessment, and monitoring of asthma. Measurements like forced expiratory volume in one second (FEV1) and FEV1/forced vital capacity (FVC) ratio help confirm airflow limitation, assess severity, and track response to bronchodilator therapy, informing decisions on asthma control. Regular spirometric assessments are essential for optimizing treatment strategies and improving patient outcomes [6].

Existing and emerging bronchodilator therapies for asthma offer diverse mechanisms of action and efficacy in improving lung function and asthma control. Both short-acting and long-acting bronchodilators, often combined with inhaled corticosteroids, remain important for symptomatic relief and preventing exacerbations. Future developments in bronchodilator therapy aim to further refine personalized asthma management [7].

Real-world evidence supports the effectiveness of single-inhaler triple therapy (ICS/LABA/LAMA) for patients with uncontrolled asthma. Studies have demonstrated significant improvements in asthma control, reductions in exacerbation rates, and enhanced lung function, as evidenced by spirometry. This reinforces the value of this therapeutic approach in complex asthma cases, providing practical insights into its benefits outside of controlled clinical trial settings [8].

Beyond simple symptom scores and FEV1, a broader, more holistic assessment of asthma control is advocated. This approach considers other pulmonary function parameters, airway inflammation markers, and patient-reported outcomes to capture the full spectrum of disease burden. It guides personalized bronchodilator and anti-inflammatory strategies, aiming to identify persistent airway dysfunction not fully reflected by conventional measures and optimize treatment adjustments [9].

Finally, the impact of bronchodilators on small airway function in

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asthma is often underestimated. While standard spirometry primarily assesses large airways, advanced pulmonary function tests can reveal significant improvements in small airway mechanics post-bronchodilation. These improvements correlate with better symptom control and reduced exacerbations, suggesting that targeting small airway dysfunction with appropriate bronchodilator strategies is crucial for comprehensive asthma management, offering insights beyond conventional FEV1 measurements [10].

Conclusion

Current guidelines for adult asthma management highlight the critical role of objective assessments like pulmonary function tests (PFTs) in diagnosis and ongoing monitoring. These tests help guide therapeutic decisions, ensuring personalized care. Bronchodilators, particularly long-acting beta-agonists (LABAs) used in conjunction with inhaled corticosteroids (ICS), form the cornerstone of treatment strategies aimed at achieving and maintaining asthma control. Symptom severity combined with PFT results dictates the approach, which aims to provide symptomatic relief and prevent acute exacerbations.

There's a notable shift in global recommendations, with the Global Initiative for Asthma (GINA) 2021 report moving away from short-acting beta-agonists (SABAs) as monotherapy. Instead, it promotes inhaled corticosteroid-formoterol as a preferred reliever, underscoring a personalized, risk-stratified treatment approach. For patients with stable asthma, long-acting bronchodilators (LABAs and LAMAs), especially when combined with ICS, significantly improve lung function, reduce exacerbations, and enhance overall control compared to placebo or monotherapy.

Triple therapy, involving an inhaled corticosteroid, a long-acting beta-agonist, and a long-acting muscarinic antagonist, proves beneficial for severe asthma cases inadequately controlled on dual therapy. This approach can further improve lung function, lower exacerbation rates, and boost asthma control, particularly in patients presenting features of both asthma and Chronic Obstructive Pulmonary Disease. Spirometry, a key pulmonary function test, is essential for confirming airflow limitation, assessing disease severity, and tracking treatment response. Beyond basic spirometry, a more holistic assessment of asthma control considers other pulmonary function parameters, airway inflammation markers, and patient-reported outcomes to address persistent airway dysfunction. Adherence to maintenance therapy and appropriate bronchodilator use are vital for optimizing outcomes, with emerging evidence pointing to the significant impact of bronchodilators on small airway function, often underestimated by standard measurements.

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