

# Refractory asthma and sleep apnea:

when mast cells obstruct breathing

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## The airways as a prime target

Bronchial and laryngeal mucosae are among the most mast cell-rich tissues in the human body. Their activation releases histamine, leukotrienes (LTC<sub>4</sub>, LTD<sub>4</sub>, LTE<sub>4</sub>) and prostaglandins — the classical mediators of bronchoconstriction. In the PMCHS terrain, this mechanism is chronically activated at a subclinical level, producing persistent bronchial hyperreactivity that does not always respond to conventional treatments targeting eosinophilic inflammation or IgE-mediated allergy.

## Mast cell asthma: when bronchodilators are not enough

A significant subgroup of patients labelled 'difficult-to-control asthma' actually presents non-IgE-mediated bronchial mast cell activation — meaning without classically identifiable allergy. Triggers are not allergens in the strict sense, but mast cell activators: certain foods, physical exertion, temperature changes, stress, fragrances, medications (NSAIDs, ACE inhibitors).

*“Asthma whose episodes occur after certain meals, in cold weather, or during periods of intense stress, without an identified allergen, should raise suspicion of a mast cell component in a PMCHS terrain.”*

In this context, leukotrienes play a central role: montelukast (leukotriene receptor inhibitor) can bring improvement where inhaled corticosteroids remain insufficient.

## Sleep apnea and mast cells

The link between mast cell activation and obstructive sleep apnea (OSA) is less well known but mechanistically coherent. Laryngeal and pharyngeal mast cell degranulation causes nocturnal mucosal oedema, worsening the collapsibility of the upper airways. Apneas without obvious overweight, or resistant to positive airway pressure (CPAP), may partly stem from this mechanism.

Furthermore, nocturnal histamine release — favoured by evening meals rich in histamine or histamine liberators — can fragment sleep independently of apneas, producing unexplained daytime fatigue despite apparently effective CPAP.

## Chronic cough and laryngospasm

Chronic cough without identifiable ENT or pulmonary cause, persistent throat-clearing, laryngospasm episodes or unexplained stridor are part of the respiratory spectrum of the PMCHS terrain. Histamine and prostaglandins sensitise cough receptors (bronchial C-fibres), lowering the triggering threshold. These presentations sometimes respond remarkably to H<sub>1</sub> antihistamines or inhaled cromoglycate.

## What this means in practice

- Note the **triggers of episodes**: foods, stress, exercise, temperature, medications. A non-allergic pattern points towards a PMCHS component.
- Discuss with your pulmonologist a **trial of montelukast** if a leukotriene component is suspected.
- **Low-histamine diet in the evenings** in case of apneas or fragmented sleep without obvious cause.
- **Global mast cell stabilisation** (quercetin, luteolin) can reduce baseline bronchial hyperreactivity over several weeks.