



## Case report

# Successful long-term, adjunctive use of guaifenesin in a patient with a complex atopic medical history and primary immune deficiency: A case report

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## ARTICLE INFO

## Keywords:

Chronic bronchitis

Chronic sinusitis

Primary immune deficiency

Guaifenesin

Long-term therapy

## ABSTRACT

We report the case of a 45 year old female patient who suffered from recurrent respiratory infections, asthma, allergies and atopic dermatitis since childhood and multiple autoimmune and chronic respiratory conditions as an adult, who has achieved symptoms remission through a combination of immunotherapy and the daily use of over-the-counter high-dose guaifenesin.

## 1. Introduction

One in four Americans has multiple chronic conditions, that either require ongoing medical attention or limit activities of daily living [1]. As an individual's number of chronic conditions increases, the risk for dying prematurely, being hospitalized, and receiving conflicting advice from health care providers increases [2]. We report on one such patient, who presented with multiple chronic conditions, including chronic bronchitis, chronic sinusitis and asthma which severely compromised daily functioning and quality of life.

Chronic bronchitis has numerous clinical consequences, including an accelerated decline in lung function, predisposition to lower respiratory tract infection and heightened mortality. Treatment goals include reducing overproduction of mucus, decreasing mucus hypersecretion and facilitating elimination of mucus. Similarly, the aims of chronic sinusitis treatment include elimination of the infection, reduced sinonasal inflammation, and improved drainage of mucus and secretions.

While guaifenesin (Mucinex<sup>®</sup>, Reckitt Benckiser) is indicated to loosen phlegm and thin bronchial secretions in patients with stable chronic bronchitis, it has not been approved for use in chronic sinusitis. Furthermore, the professional labeling for chronic bronchitis makes no recommendations for duration of use and the over the -counter (OTC) labeling recommends limited short-term use and there is little published data demonstrating the long-term use or clinical benefit of guaifenesin in either condition.

## 2. Case report

In 2015, a 45 year old female non-smoker, presented to our office, requesting a comprehensive assessment and holistic management of her multiple medical conditions. She had recently relocated from New York to Texas, hoping that the dryer climate would help to improve upper respiratory symptoms (non-productive chronic cough, mucus accumulation and post-nasal drip), that were adversely affecting her quality of life.

Past medical history revealed a classic atopic march – childhood atopic dermatitis, food allergies, allergic rhinitis and asthma, all of which had persisted into adulthood. She also reported suffering from bronchitis throughout her life, recurrent pneumonia and more recently an eleven month episode of viral pleurisy. At the time of her visit, chronic conditions included moderate-to-severe asthma, stable chronic bronchitis (6–8 exacerbations/year), food and medication allergies, chronic sinusitis with nasal polyps, celiac disease, inflammatory bowel syndrome (IBS) and Raynaud's syndrome.

Medications included monthly omalizumab (Xolair<sup>®</sup>, Genentech) and allergy immunizations for pollens, molds and dust mites. In addition she took daily montelukast sodium (Singulair<sup>®</sup>, Merck), azelastine nasal spray, cetirizine, OTC acetaminophen 325mg/guaifenesin 200mg/phenylephrine 5mg (Mucinex<sup>®</sup> Sinus-Max<sup>®</sup> Pressure & Pain Caplets, Reckitt Benckiser) and used a proprietary isotonic saline nasal rinse, every other day. She also had a levalbuterol inhaler, but had not used it since moving to Texas.

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<https://doi.org/10.1016/j.rmcr.2018.08.011>

Received 14 August 2018; Accepted 16 August 2018

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Clinical chemistry revealed an IgG level of 466 mg/dL, with sluggish response to pneumococcal stimulation indicating mild-moderate hypogammaglobulinemia (reference range 700–1600mg/dL). Given her recurrent infections we concluded she likely has Primary Immunodeficiency Disease (PIDD) with hypogammaglobulinemia. Monthly intravenous immunoglobulin (IGIV) therapy was commenced, but ultimately discontinued due to severe side effects, including crippling migraines, irrespective of the product used, concentration, osmolarity and speed of infusion - all factors known to influence side-effects.

Although she had been taking a low-dose guaifenesin containing multi-symptom OTC cold and sinus medication for 10 years, we recommended that she commence higher dose guaifenesin (Mucinex®, Reckitt Benckiser) 600 mg, twice daily to relieve the thick mucus she felt was constantly in the back of her throat and was unable to expectorate.

Since starting the higher dose of guaifenesin, she reports that post nasal drip is significantly reduced, her cough is improved and mucus is much less viscous and easier to expectorate. No further sinus infections have been reported and the nasal congestion resulting from the nasal polyps is less problematic.

In parallel, we have been able to discontinue allergy shots and omalizumab with no relapse and perceived significant improvement in quality of life. In total, she has been using guaifenesin on an almost daily basis for almost ten years – the last 3 years at a higher dose. Although warned about the potential for nausea, the patient denies any treatment-related side-effects. Temporary cessation of guaifenesin has resulted in recurrence of mucus related symptoms and cough within 2–3 days, so at this time the patient has no plans to discontinue the current treatment.

### 3. Discussion

All chronic diseases tend to exacerbate and remiss over years. The primary immunodeficiency that may be at the root of this patient's problem still exists (current IgG – 510 mg/dL), but some of the

complicating factors of her environmental related allergies and asthma have been modified by allergen-specific immunotherapy immunization and omalizumab, both of which have been shown to result in disease modification and remission [3–6]. In patients with multiple chronic diseases, clinicians should consider the underlying common pathophysiology and explore low risk treatment options. In this patient, the use of daily high dose guaifenesin appears to have a very favorable risk: benefit profile.

### Acknowledgements

This work was supported by Reckitt Benckiser (RB) who provided financial support to SRxA, Strategic Pharmaceutical Advisors for data collection and drafting of the case report. RB had no role in the selection of author or development, interpretation or submission of data. No conflicts of interest reported.

### Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.rmcr.2018.08.011>.

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