

CASE REPORT

Improved quality of life associated with long-term daily use of guaifenesin (Mucinex[®]) in a patient with chronic rhinosinusitis: a case report

Ethan Singer¹ and Judi E. Miller^{2,*}

¹Lakota Healthcare Family Practice, Unit #7, Gresham's Landing, 2489 US 6, Hawley, PA 18428, USA, and ²SRxA Strategic Pharmaceutical Advisors, 1750 Tysons Boulevard, Suite 1500, McLean, VA 22102, USA

*Correspondence address. SRxA Strategic Pharmaceutical Advisors, 1750 Tysons Boulevard, Suite 1500, McLean, VA 22102, USA. Tel: +1-202-316-8692; Fax: +1-202-747-3415; E-mail: jmiller@srxa.com

Abstract

Chronic rhinosinusitis (CRS) is a common disease, and although not life-threatening, carries a vast symptom and economic burden and is associated with significant impairment in quality of life. We report the rapid improvement of symptoms and quality-of-life following initiation of adjunctive daily oral guaifenesin therapy in a 41-year-old male patient with CRS, who presented to our primary care clinic with recurrent infections, severe sinonasal symptoms, cough and hearing loss. Continued daily use of over-the-counter guaifenesin, for almost 3 years, has broken his cycle of recurrent sinus infections. Given that CRS is the most common reason for ambulatory prescription of antibiotics, the observed reduction in infections may have also helped him to avoid antibiotics, thereby reducing his risk for antibiotic resistance and unnecessary adverse events.

INTRODUCTION

Chronic rhinosinusitis (CRS) is an inflammatory disease of the nasal and paranasal sinus, often resulting from untreated or unresolved acute sinusitis [1]. Stasis of secretions provides a medium for the growth of pathogens that contribute to increased mucosal inflammation [2].

CRS is one of the most prevalent chronic illnesses in the USA, affecting up to 30 million people and resulting in substantial disease and economic burden for patients and significant indirect costs for society [3].

Sinonasal symptoms of CRS include stuffiness, postnasal drip, facial pressure and mucopurulent drainage [4]. However, the most frequent complaints reported by patients are those affecting quality of life, i.e. sleep, productivity and mood [5]. Health-related quality of life (HRQoL) is influenced by the individual's perception and can enable clinicians to understand

how illness interferes with daily life and optimize clinical outcomes. CRS has been shown to substantially reduce HRQoL [5]. The burden and severity of CRS can be assessed using a validated disease-specific questionnaire. The Sinonasal Outcome Test* (SNOT-22) comprises 22 nose, sinus and social/emotional quality of life domains. The patient is asked to grade each item on a scale of 0–5 as experienced over the previous 2 weeks.

Aims of CRS treatment include elimination of the infection, reduced sinonasal inflammation and improved sinus drainage. Medical management includes the use of nasal decongestants, topical and systemic corticosteroids, saline irrigation, steam inhalation, topical cromolyn and antibiotics [4].

A recent analysis showed that CRS is the most common reason for ambulatory prescription of antibiotics, with 69.3% of visits resulting in antibiotic prescriptions [6]. This creates the potential for unnecessary adverse events and increased bacterial resistance [7].

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While there is no Food and Drug Administration (FDA) approval for this indication, it has been suggested that guaifenesin may be helpful in ameliorating CRS related symptoms [8].

CASE REPORT

A 41-year-old male patient presented to our primary care clinic with a 3-week history of right sided facial pressure, increased posterior nasal drainage, chronic cough, headache and earache accompanied by some hearing loss. His chief concern was the negative impact of these symptoms on his quality of life. He felt unable to socialize due to the headaches and cough and he was unable to travel by air or pursue his hobby of scuba diving due to fluid and pressure in his ears.

Past medical history included lifelong seasonal allergies to mold, various trees and grasses. He had suffered from back-to-back acute sinus infections for at least 20 years and was diagnosed with CRS 6 years ago.

He was a former smoker (1.5 pack years), but had given up 12 years prior to his visit. At the time of this visit he was taking azelastine hydrochloride and fluticasone propionate nasal spray, (Dymista®, Mylan); levocetrizine HCl 5 mg (Xyzal®, Chattem Inc.) and montelukast 10 mg (Singulair®, Merck).

Clinical examination revealed slight effusion to the right tympanic membrane, bilateral inflamed turbinates and mild erythema to the posterior pharynx. Transillumination of the right maxillary sinus showed reduced glow on the hard palate indicative of right maxillary sinus congestion. Lungs auscultated clear bilaterally.

A CT scan of his sinuses revealed inflammation to the inferior and middle nasal concha, along with a large opacity in the right maxillary sinus and partial opacity in the left maxillary sinus cavities. An endoscopic sinus exam confirmed chronic maxillary and ethmoidal thickening, and subsequent retention of sinus mucus. A mucopurulent posterior oropharynx discharge indicated infective sinusitis.

His SNOT-22 score was 79, indicating severe CRS [9].

Based upon a recent publication detailing of guaifenesin use in a patient with chronic obstructive pulmonary disease (COPD) [10], we felt it may also benefit this patient. We recommended he commence guaifenesin (Mucinex® Reckitt Benckiser) at a dose of 1200 mg daily.

Within two weeks of commencing guaifenesin he reported a significant reduction in cough, headaches, sinus congestion, facial and ear pressure along with improvement in mucus clearance, sinus drainage and hearing.

A repeat SNOT 22 one month after commencing guaifenesin revealed a score of 15, which indicates mild disease [9]. This rapid, 64 point improvement in sinonasal HRQoL included several notable observations. In pre-guaifenesin scoring, the patient did not assign a score of zero (no problem) or 1 (very mild problem) to any of the 22 items. Six items were rated at a 2 (mild or slight problem), 18 at 3 (moderate problem), 40 at 4 (severe problem) and 15 at a 5 (problem as bad as can be) (Fig. 1). Post-guaifenesin, he rated 10 domains as a 0, 9 at 1 and 3 at 2. None of the 22 items were rated higher than 2 (mild or slight problem) (Fig. 2).

Repeat CT imaging performed three months after starting guaifenesin showed complete resolution of previous visualized opacities and no inflammation to the nasal concha.

The patient has now been treated with daily guaifenesin for 2 and a half years and has no plans to discontinue. During this period, there has been no recurrence of the revolving sinus infections that have plagued his entire adult life. In addition to

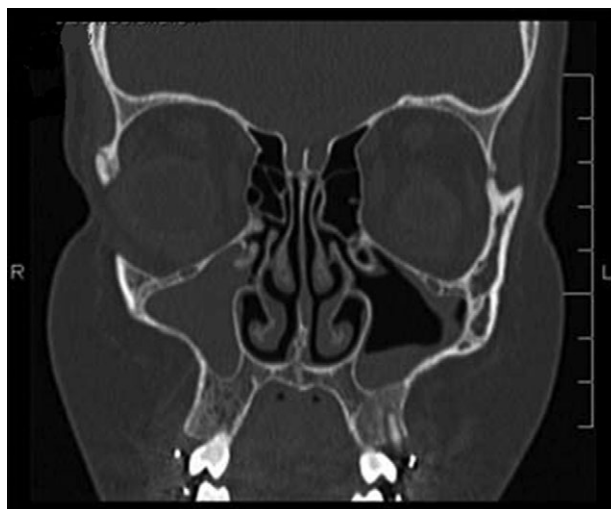


Figure 1: Sinus CT imaging pre-guaifenesin.



Figure 2: Sinus CT imaging post-guaifenesin.

symptom reduction, he reports improved quality of life, and has resumed air travel and scuba diving.

DISCUSSION

Mucus hypersecretion is a common feature of inflammatory CRS. Although guaifenesin is not approved in this condition, two double-blind placebo-controlled studies in HIV positive patients with rhinosinusitis, showed that those in the guaifenesin group had significantly less nasal congestion, thinner post-nasal secretions and improved SNOT scores versus the placebo group [8].

This single patient case study suggests that daily guaifenesin may have contributed to rapid improvement of symptoms and quality-of-life in a patient with CRS and that these effects are sustainable with long-term use.

We postulate that use of adjuvant guaifenesin, an over-the-counter medication with a favorable risk: benefit profile, may be an alternate approach for the management of CRS patients who are not suitable candidates for surgery. Furthermore, the resolution of sinus infections in this patient resulted in fewer antibiotics being prescribed.

Further prospective studies are needed to confirm the efficacy of guaifenesin to clear mucus from the sinuses, relieve

symptoms, reduce infection as well as improve quality of life in patients with CRS.

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CONFLICT OF INTEREST STATEMENT

No conflicts of interest

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ETHICAL APPROVAL

Not required for this retrospective case report.

CONSENT

Written patient consent was obtained and can be made available upon request.

GUARANTOR

Judi Miller.

REFERENCES

1. Fokkens W, Lund V, Mullol J. European position paper on rhinosinusitis and nasal polyps 2007. *Rhinol Suppl* 2007;20:1-136.
2. Naclerio RM, Bachert C, Baraniuk JN. Pathophysiology of nasal congestion. *Int J Gen Med* 2010;3:47-57.
3. DeConde AS, Soler ZM. Chronic rhinosinusitis: epidemiology and burden of disease. *Am J Rhinol Allergy* 2016;30:134-9.
4. Meltzer EO, Hamilos DL. Rhinosinusitis diagnosis and management for the clinician: a synopsis of recent consensus guidelines. *Mayo Clin Proc* 2011;86:427-43.
5. Rudmik L, Smith TL. Quality of life in patients with chronic rhinosinusitis. *Curr Allergy Asthma Rep* 2011;11:247.
6. Smith SS, Evans CT, Tan BK, Chandra RK, Smith SB, Kern RC. National burden of antibiotic use for adult rhinosinusitis. *J Allergy Clin Immunol* 2013;132:1230-2.
7. Antibiotic Resistance Threats in the United States. 2013. <http://www.cdc.gov/drugresistance/threat-report-2013/index.html>. (17 May 2018, date last accessed).
8. Albrecht HH, Diczpinigaitis PV, Guenin EP. Role of guaifenesin in the management of chronic bronchitis and upper respiratory tract infections. *Multidiscip Respir Med* 2017;12:31.
9. Toma S, Hopkins C. Stratification of SNOT-22 scores into mild, moderate or severe and relationship with other subjective instruments. *Rhinology* 2016;54:129-33.
10. Storms WW, Miller JE. Improved lung function and quality of life following guaifenesin treatment in a patient with chronic obstructive pulmonary disease (COPD): a case report. *Respir Med Case Rep* 2018;24:84-5.