



Case report

Improved lung function and quality of life following guaifenesin treatment in a patient with chronic obstructive pulmonary disease (COPD): A case report



William W. Storms^a, Judi E. Miller^{b,*}

^a The William Storms Allergy Clinic, 1625 Medical Center Point, Suite 190, Colorado Springs, CO 80907, USA

^b SRxA Strategic Pharmaceutical Advisors, 1750 Tysons Boulevard, Suite 1500, McLean, VA 22102, USA

ABSTRACT

We report improved lung function and quality of life following daily use of guaifenesin/dextromethorphan (Mucinex DM[®], Reckitt Benckiser) for the treatment of mucus-related symptoms in a patient with COPD, who presented with increasing dyspnea, progressive cough and chest congestion.

1. Introduction

Chronic obstructive pulmonary disease (COPD) is an umbrella term used to describe a group of common respiratory diseases including chronic bronchitis and emphysema. COPD is characterized by chronic inflammation, narrowing of the small airways and destruction of lung parenchyma [1,2]. It affects more than 15.7 million people in the United States and is associated with high morbidity [3,4] mortality. Due to its chronic nature, COPD is associated with frequent clinician visits and hospitalizations for acute exacerbations. Characteristic features of the disease include mucus hypersecretion and decreased mucus transport. This mucociliary dysfunction contributes to the development of the chronic, progressive airflow limitation seen in COPD. Guaifenesin (Mucinex[®], Reckitt Benckiser) is a mucoactive drug that works by loosening mucus in the airways and making coughs more productive. We recently reported its successful use as adjunctive therapy in a patient with stable chronic bronchitis [5], but there is little published data demonstrating either the long-term use or clinical benefit of Mucinex in patients with COPD.

2. Case report

An 80-year-old female former pack per day smoker (40 pack years) with a 20 year history of chronic obstructive pulmonary disease (COPD) has been managed in our practice for > 11 years. Her respiratory comorbidities include severe persistent asthma, chronic sinusitis, allergic rhinitis and congestive heart failure. Over the course of her disease she had been treated with multiple antibiotics, anti-inflammatory, and bronchodilator medications including Symbicort (budesonide/

formoterol; Astra Zeneca), Dulera (formoterol/mometasone; Merck), Spiriva Respimat (tiotropium bromide; Boehringer Ingelheim), Stiolto Respimat (tiotropium bromide/olodaterol; Boehringer Ingelheim), Serevent Diskus (salmeterol; GSK), Cipro (ciprofloxacin), Avelox (moxifloxacin; Bayer), Bactrim (trimethoprim & sulfamethoxazole), Omnicef (cefdinir), Levaquin (levofloxacin), Biaxin (clarithromycin), azithromycin and prednisone.

Despite compliance with her medications, the patient typically experienced acute exacerbations every two months.

Her Asthma Control Test (ACT) Quality of Life (QoL) score was 10, suggesting poor control. (Scores of ≤ 15 indicate asthma is very poorly controlled).

Forced expiratory volume in one second (FEV1) was 82% of predicted value.

In March 2013, she presented to our office with increasing dyspnea, progressive cough and chest congestion. She estimated her daily mucus production to be approximately 30 ml.

Mucinex DM[®] (guaifenesin/dextromethorphan; Reckitt Benckiser) was prescribed at a dose of 600mg twice daily for three months. Within one week of adding guaifenesin to her medication regimen, the patient stated “it was easier to breathe” and reported improvements in mucus clearance and ability to perform daily activities. She estimated that daily mucus production increased to approx. 60mL after starting guaifenesin. No product related side effects or adverse events occurred during the three months of guaifenesin/dextromethorphan therapy. On follow-up, her ACT score was 17 – an increase of 70% and FEV1 was 92% (9.75% increase). After discontinuing guaifenesin, these improvements persisted and exacerbation frequency decreased from one every two months to one every four months.

* Corresponding author.

E-mail addresses: wstorms@stormsallegry.com (W.W. Storms), jmiller@srxa.com (J.E. Miller).

3. Discussion

Therapy with mucoactive drugs may be an important component in the treatment of patients with COPD in which mucus hypersecretion is present. Studies have shown that guaifenesin has multiple effects on mucus, including increasing the volume of bronchial secretions, decreasing mucus viscosity and promoting more effective expectoration [6–8]. Guaifenesin may also have direct effects on respiratory tract epithelial cells, including suppressed mucin production, reduced mucus viscoelasticity, improved mucociliary clearance and inhibition of cough reflex sensitivity [9,10].

While the literature suggests that guaifenesin may be of benefit in COPD and other chronic respiratory conditions [11], we believe this is the first case report on the successful daily use of guaifenesin in a patient with COPD.

In this patient, with a 20 year history of COPD, we observed that the daily use of guaifenesin may have contributed to a rapid improvement in lung function and quality of life. Further studies are needed to confirm these observations in a larger patient population.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.rmcr.2018.04.009>.

References

- [1] <http://www.who.int/respiratory/copd/definition/en/> Accessed December 19, 2017.
- [2] <http://goldcopd.org/wp-content/uploads/2016/12/wms-GOLD-2017-Pocket-Guide.pdf>. Accessed October 31, 2017.
- [3] <https://www.cdc.gov/copd/index.html>. Accessed December 28, 2017.
- [4] GBD 2015 Chronic Respiratory Disease Collaborators, Global, regional, and national deaths, prevalence, disability-adjusted life years, and years lived with disability for chronic obstructive pulmonary disease and asthma, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015, *Lancet Respir. Med.* 5 (2017) 691.
- [5] W.W. Storms, J.E. Miller, Daily use of guaifenesin (Mucinex) in a patient with chronic bronchitis and pathologic mucus hypersecretion: a case report, *Resp. Med. Case Rep.* 23 (2018) 156–157.
- [6] D.F. Rogers, Physiology of airway mucus secretion and pathophysiology of hypersecretion, *Respir. Care* 52 (2007) 1134–1146.
- [7] E. Houtmeyers, R. Gosselink, G. Gayan-Ramirez, M. Decramer, Effects of drugs on mucus clearance, *Eur. Respir. J.* 14 (1999) 452–467.
- [8] C. Martin, J. Frija-Masson, P.R. Burgel, Targeting mucus hypersecretion: new therapeutic opportunities for COPD? *Drugs* 74 (2014) 1073–1089.
- [9] P.V. Dicipinigitis, Y.E. Gayle, Effect of guaifenesin on cough reflex sensitivity, *Chest* 124 (2003) 2178–2181.
- [10] P.V. Dicipinigitis, Y.E. Gayle, G. Solomon, R.D. Gilbert, Inhibition of cough-reflex sensitivity by benzonatate and guaifenesin in acute viral cough, *Respir. Med.* 103 (2009) 902–906.
- [11] H.H. Albrecht, P.V. Dicipinigitis, E.P. Guenin, Role of guaifenesin in the management of chronic bronchitis and upper respiratory tract infections, *Multidiscip. Respir. Med.* 12 (2017) 31.