



Editorial

“Kitchen Sink” versus “Out the Door” Asthma Management

Larry B Mellick

Department of Emergency Medicine, Augusta University Medical Center, 1120, 15th Street, Room AF-2053 Augusta, GA 30912, USA

***Corresponding author:** Larry B. Mellick, Department of Emergency Medicine, Augusta University Medical Center, 1120 15th Street, Room AF-2053 Augusta, GA 30912, USA, Tel: + 706 533-2931; Email: lmellick@augusta.edu

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Editorial:

It is not uncommon to see articles about treatment options for the crashing asthma patient. Typically, these publications discuss every therapeutic option available including the proverbial “kitchen sink” for managing severe asthma emergencies. Generally, “kitchen sink” recommendations include continuous albuterol nebulization, intravenous magnesium sulfate, intramuscular epinephrine or terbutaline, noninvasive (NIV) positive pressure ventilation, helium-oxygen administration and ultimately intubation and ventilation using ketamine. Nevertheless, there is another category of asthma management that is far less commonly discussed. Another very common clinical setting is the patient whose bronchospasm has improved but his or her disease process appears to be resistant to ongoing interventions and remains severe enough that discharge “out the door” is not a consideration.

The typical emergency department asthma protocols will use repeated albuterol treatments with at least two of those treatments combined with nebulized ipratropium bromide. Additionally, corticosteroids are administered either orally or intravenously. When these interventions fail most practitioners continue to treat the bronchospasm with additional doses of albuterol and ultimately continuous nebulization of β_2 agonist. However, when these investigations have already not resolved the mild to moderate persistent bronchospasm, continuing to treat the patient with the same medication seems a little illogical. Nevertheless, most clinicians maintain a relatively limited number of therapeutic tools in their toolbox when it comes to the routine management of asthma. And consequently, at least in my experience, many patients are ultimately admitted to the hospital for ongoing treatment because other asthma treatment options are overlooked.

This editorial is a brief discussion of evidence for the potential effectiveness of five other potential asthma treatment options currently not commonly used by clinicians. The treatment options will be discussed in the order of their strength of evidence beginning with those with the strongest apparent evidence. It is the

author’s opinion that adding one or more of these therapeutic interventions to a clinician’s therapeutic toolbox will result in fewer patients being admitted and more patients crossing the threshold of the emergency department door as they head for home.

Inhaled Corticosteroids

One of the best supported asthma management options is that of inhaled corticosteroids. The literature supporting this intervention is consistently positive and appears to support the use of inhaled steroids in addition to other systemic corticosteroids. In our shop we typically give one dose of oral dexamethasone (0.6 mg/kg) up to a maximum of 16 mg for asthma exacerbations that have been ongoing for one to two days and resistant to home management. My choice for an inhaled or nebulized corticosteroid is 0.5 mg of budesonide, but other options are also effective.

A published review article and a Cochrane review of the benefits of inhaled corticosteroids provide excellent supporting evidence for routinely adding this intervention to patients with recalcitrant bronchospasm [1,2]. The Cochrane review states the following: “This review found that inhaled corticosteroids used alone or in combination with systemic corticosteroids helped to relieve asthma.” [1] The review article by Volovitz summarizes its findings as follows, “The current evidence base revealed encouraging results regarding the efficacy of the ICS budesonide in patients with wheeze and acute worsening of asthma” [2].

Intramuscular or Nebulized Epinephrine

Epinephrine has always worked for bronchospasm. Older clinicians remember well using subcutaneous epinephrine every twenty minutes as the standard management for asthma exacerbations. And, despite the tears caused by the painful injections, it worked. In truth, the literature is packed with papers that describe both injected and nebulized epinephrine as being non-inferior to older agents such as terbutaline oralbuterol. In other words, it works equally well to the bronchodilator medications that we currently use. It is just easier and less objectionable to nebulize medi-

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have come to exactly opposite conclusions. The evidence for this intervention was reviewed in a 2012 Cochrane review and the final implications for practice statements were as follows: [21]

1. Treatment with nebulised MgSO₄ could be considered in addition to inhaled β₂-agonists and ipratropium bromide in combination as per most national guidelines in asthma exacerbations, particularly in those patients with more severe exacerbations. However this point, regarding severity, requires further investigation in clinical trials. More data are required especially in pediatric studies.
2. There is no evidence that nebulised MgSO₄ can be used as a substitute for inhaled β₂-agonists.
3. Nebulised MgSO₄ appears to be effective and safe to administer to patients experiencing asthma exacerbations.

However, a 2013 systematic review and meta-analysis by Shan et al. reported that the use of nebulized magnesium sulfate appears to produce benefits just for adults and not children [22]. And then, a 2016 systematic review and meta-analysis by Su et al. came to the conclusion that while intravenous magnesium sulfate was an effective treatment in children, nebulized magnesium sulfate treatment showed no significant effect on respiratory function or hospital admission and further treatment [23]. And another 2016 meta-analysis of adult patients treated with nebulized magnesium sulfate stated that evidence to date suggests that nebulized MgSO₄ has no role in the management of adult patients with acute or stable asthma [24].

The bottom line is that while there are studies that conclude nebulized MgSO₄ alone or combined with salbutamol has a clinically significant bronchodilator effect in acute asthma and leads to clinical improvement, increase in PEFr, reduction in heart rate and reduction in respiratory rate, [25,26] other studies come to the exact opposite conclusion [27]. No studies, however, found that nebulized magnesium sulfate was harmful. Finally, the actual dosage of MgSO₄ nebulized may vary between the studies and could be a contributing factor to this variability in findings and conclusions.

Conclusion

For the clinician who finds himself or herself regularly frustrated with asthma patients improving but lingering at clinical asthma scores incompatible with discharging home, consider trying some of the other treatment modalities that have either been overlooked or put on the shelf because of our newer therapeutic tools for treating asthma. It is possible that more patients will have their bronchospasm successfully treated and be eligible for discharge after responding to these other "out-the-door" asthma management options.

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