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LETTER TO THE EDITOR

Inhaled MgSO₄ in acute asthma: are we on the right course?

1 Dear Editor

2 I found the article entitled “Inhaled magnesium versus
3 inhaled salbutamol in rescue treatment for moderate and
4 severe asthma exacerbations in pediatric patients” by
5 Debiazzi et al., published in this journal, very interesting.¹
6 Although the acute management of asthma is a frequent sit-
7 uation in emergency departments, we don't have any new
8 drugs capable of modifying the acute course of the disease.
9 Our care protocols have been little changed over the last
10 20 years. The mainstays of pharmacological treatment
11 remain the use of inhaled drugs (agonist beta-2 adrenergics
12 and anticholinergics), as well as corticosteroids, used by dif-
13 ferent routes of administration.²

14 In this scenario, magnesium sulphate (MgSO₄) has been
15 considered as a therapeutic option in the management of
16 acute asthma refractory to standard therapy. Both the intra-
17 venous and inhaled routes have been used; however, only
18 the benefits of the intravenous route in promoting broncho-
19 dilation have been proven and have been increasingly incor-
20 porated into care protocols.^{2,3} In the inhalation route
21 (nebulization), the results and evidence associated with its
22 use are controversial. The inhalation route has the potential
23 to offer some benefits, extrapolating data on the use of
24 other drugs by this route: rapid onset of action and reduced
25 incidence of side effects.⁴ Despite the established contro-
26 versy, the most recent recommendations from the Global Ini-
27 tiative in National Asthma and the British Thoracic Society
28 have modified their previous recommendations for the use
29 of inhaled MgSO₄ for the treatment of acute asthma attacks
30 in an emergency setting. Contrary to data from previous
31 reviews, more recent systematic reviews have not supported
32 the benefits associated with the use of inhaled MgSO₄ in the
33 treatment of acute asthma in both adults and children.^{2,3,5,6}

34 Debiazzi et al., in an elegant way, explicitly state that
35 the results should be interpreted with caution, as we are
36 evaluating data from a pilot study with a small number of
37 patients.

38 We can generalize this discussion, as the data from all the
39 literature is still insufficient to establish a critical and well-
40 founded judgment. Not even the doses used for inhalation
41 medication are standardized. The dose response relationship
42 and frequency of administration at different ages are

required to identify the exact amount of magnesium sul- 43
phate to be used during the acute asthma attack as inappro- 44
priate dosage cannot give the desired response. 45

46 Recently, Asif et al. taking advantage of this lack of data,
47 evaluated three different doses (250 mg, 500 mg or 750 mg)
48 of inhaled MgSO₄ every 20 min for 60 min, in additive ther-
49 apy to inhaled salbutamol. Children of either gender
50 between two to 12 years of age, with the diagnosis of asthma
51 having Pediatric Respiratory Assessment Measure (PRAM)
52 score > 4. The combination of salbutamol with higher doses
53 of nebulized MgSO₄ resulted in an greater clinical
54 improvement.⁷

55 In addition, we are struck by the concern of some studies
56 with the preparation of the isotonic MgSO₄ solution to be
57 used in nebulization. The process has involved tonicity
58 adjustments, pH control and sterilization, and dispensing in
59 individual flaconettes (with different concentrations) by the
60 pharmacists involved in the process. Few studies have
61 detailed the preparation of their inhaled MgSO₄ solutions.⁶

62 We can't ignore the fact that MgSO₄ itself, administered
63 intravenously, took a long time to be considered a safe and
64 effective therapy. Until recently, some countries still had
65 low adherence to this therapeutic option. Many studies car-
66 ried out in adult and child populations have brought new
67 data that has been used to justify the use of the intravenous
68 route in care protocols for patients hospitalized for acute
69 asthma.

70 We therefore agree with the observations made by
71 Debiazzi et al. on the need for more studies, with adequate
72 sample sizes and longer evaluation periods.¹ However, it is
73 important that methodological criteria which include dose
74 distinctions and adequate preparation of inhaled MgSO₄ so-
75 lutions are also considered.

Declaration of competing interest

The author declares no conflicts of interest.



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