The Dilemma of Albuterol Dosing for Acute Asthma Exacerbations in Pediatric Patients

To the Editor:

Inhaled albuterol is a first-line treatment of acute asthma exacerbations. Nebulized albuterol doses recommended by expert consensus guidelines for exacerbations in children ≤ 12 years of age are "0.15-0.3 mg/kg up to 10 mg every 1-4 hours as needed, or 0.5 mg/kg/hour by continuous nebulization."¹ Although the benefit of continuous treatment is well established, we can find only one, small randomized controlled trial (N = 33) that compared the recommended guideline continuous nebulized albuterol (CNA) dose (10 mg/h) with a lower dose, a level of evidence meeting at best grade B2.²⁻⁴ We are not aware of evidence to support even higher doses, and there has long been concern about the disparity of doses used for these episodes.³ With this in mind, we sought to examine the doses of CNA currently in use for pediatric patients with moderate and severe asthma exacerbations managed in pediatric EDs.

We administered an Internet-based questionnaire to respiratory care directors of the Child Health Corporation of America, a network of 43 children's hospitals. The questionnaire consisted of 10 questions on albuterol treatment decisions for pediatric patients with acute asthma exacerbations managed in the ED. The questionnaire was distributed three times at 3-week intervals, and duplicate responses were excluded. The study protocol and questionnaire were approved by the Vanderbilt University Human Research Protection Program (protocol #091569), and completion of the questionnaire implied consent.

Responses were received from 22 (51%) of eligible participants. All respondents were from a pediatric-specific ED. CNA dosing was determined by institutional protocol for 16 (76%) of 21 respondents completing the question, and percent predicted peak expiratory flow or FEV₁ were used to guide CNA treatment at seven (33%) of these 21 institutions. For moderate-severity exacerbations, six (60%) of 10 completing the question reported using CNA doses that exceed current expert guidelines. All respondents reported exceeding guideline CNA doses for severe exacerbations, with three (33%) of nine who responded using 25 mg/h. There was no limit on duration of CNA treatment at 18 (82%) of the 22 institutions.

These children's hospital respiratory care directors report using CNA doses and treatment durations that frequently exceed those recommended by expert guidelines, creating a potential dilemma between the guidelines and what appears to be frequent clinical practice for pediatric patients. For this reason, and because current expert guidelines may be informed by limited evidence, further investigations are warranted of albuterol doses and treatment duration recommended by these guidelines and, in particular, of higher doses frequently used in clinical practice.

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Dr Hartert: contributed to study design and manuscript preparation and serves as Dr Arnold's NHLBI Career Development Award mentor.

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