

Effect of nebulized epinephrine versus standard treatment on PRAM score improvement in pediatric asthma exacerbations: a double-blind RCT

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ABSTRACT

Importance: Asthma exacerbations are a leading cause of emergency department (ED) visits and hospitalizations in children. Optimizing acute management is essential to improve patient.

Objective: To determine whether nebulized epinephrine, when added to standard salbutamol therapy, improves PRAM(Pediatric Respiratory Assessment Measure) scores in patients with moderate to severe asthma exacerbations.

Design, Setting, and Participants: Double-blind, randomized controlled trial at tertiary care centers. Children aged 3 to 12 years with asthma exacerbations were randomized to receive either nebulized epinephrine plus standard therapy or standard therapy alone.

Interventions: Nebulized epinephrine in addition to standard salbutamol therapy versus standard salbutamol therapy alone.

Main Outcomes and Measures: Primary outcome: Change in PRAM score at 60, 80, and 100 minutes post-intervention.

Secondary outcomes: ED stay, hospital admission, ED revisit within 72 hours, and adverse events.

Results: Thirty children were randomized (15 per group). The mean change in PRAM score at 60 minutes was 2.1 (SD 1.2) for epinephrine and 2.0 (SD 1.1) for salbutamol (difference 0.1; 95% CI, -0.6 to 0.8; $P = 0.78$). At 80, the mean change was 2.7 (SD 1.3) versus 2.5 (SD 1.2) (difference 0.2; 95% CI, -0.5 to 0.9; $P = 0.62$), and at 100, 3.1 (SD 1.4) versus 2.9 (SD 1.3) (difference 0.2; 95% CI, -0.6 to 1.0; $P = 0.64$). No significant differences were observed in ED stay, hospital admission, or ED revisit within 72 hours. Adverse events were infrequent and similar between groups.

Conclusions and Relevance: Among children with moderate to severe asthma exacerbations, addition of nebulized epinephrine to standard therapy did not result in significant improvement in PRAM scores or secondary clinical outcomes compared with salbutamol alone. These findings support current guidelines recommending salbutamol as primary therapy for asthma exacerbations and do not support routine use of nebulized epinephrine as an adjunct in this setting.

Trial Registration: ClinicalTrials.gov NCT05667727

Keywords: Asthma, epinephrine.

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