Children's Hospital of Philadelphia
PolicyLab

Safety and Effectiveness of Continuous Aerosolized Albuterol in the Non–Intensive Care Setting

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OBJECTIVE: To describe the design features, utilization, and outcomes of a protocol treating children with status asthmaticus with continuous albuterol in the inpatient setting.

METHODS: We performed a retrospective cohort analysis of children ages 2 to 18 treated in the non–intensive care, inpatient setting on a standardized treatment protocol for status asthmaticus from July 2011 to June 2013. We assessed characteristics associated with continuous albuterol therapy and, for those treated, duration of therapy and the proportion who clinically deteriorated (ICU transfer or progression to enhanced respiratory support) or who were identified as having hypokalemia or an arrhythmia. Using multivariable logistic regression, we determined which factors were associated with clinical deterioration or prolonged (>24 hours) continuous albuterol.

RESULTS: Of 3003 children meeting study criteria, 1298 (43%) received continuous albuterol. Older age, black race, lower initial oxygen saturation, and higher initial age-standardized heart rate and respiratory rate were associated with initiation of continuous albuterol therapy ($P < .001$ for all). Median duration of therapy was 14.4 hours (interquartile range, 7.7, 24.6); 340 children (26%) experienced prolonged therapy. Seventy children (5%) experienced clinical deterioration, and 33 children (3%) had identified hypokalemia or arrhythmia. Comorbid pneumonia and emergency department administration of intravenous magnesium or subcutaneous terbutaline were associated with prolonged therapy and clinical deterioration.

CONCLUSIONS: With appropriate support structures and care processes, continuous albuterol can be delivered effectively in the non-ICU, inpatient setting with low rates of adverse outcomes. Certain initial clinical characteristics may help identify patients needing more intensive therapy.

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