

Abstract

PURPOSE: To investigate safety and clinical findings of bilevel positive airway pressure (BiPAP) utilization in children 20 kg or less for asthma exacerbations. **METHODS:** Retrospective and prospective descriptive analysis of 165 enrolled subjects with moderate and severe asthma exacerbations who weighed 20 kg or less and who received BiPAP treatment at a large, urban children's hospital pediatric emergency department (PED). **RESULTS:** Age was 0.6-8.27 years (mean 3.7 years, SD 1.6 years). None exhibited worsening hypoxia, pneumothorax, or death. Four progressed to intubation after significant period on BiPAP. Overall, BiPAP subjects showed improvement in pediatric asthma score (PAS). BiPAP initiation PAS range was 8-15 (mean 12.1, SD 1.6); BiPAP termination or 4 h PAS mean was 6.3 (SD 2.2); delta PAS showed improvement mean 5.8 (SD 2.4). Seventy-one had trial off BiPAP in PED for clinical improvement; seven were restarted. PED BiPAP duration range was 30-720 min (mean 210 min, SD 158 min); total hospitalization BiPAP duration was 1-90 h. Ninety-nine (60%) subjects were admitted to the PICU and continued BiPAP for 0-47 h (mean 6.6 h, SD 8.6 h). Fifty-seven (35%) required ward admission; none were transferred to PICU. Nine (5%) were discharged home from the PED; none returned within 72 h. **CONCLUSIONS:** BiPAP utilization in acute pediatric asthma exacerbations for patients 20 kg or less is safe and may improve clinical outcomes. These findings warrant future prospective investigation of BiPAP efficacy in pediatric asthma patients.