High vs. Low Tidal Volume Ventilation for Inhalational Burn Injuries in Children

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Some outcomes appeared to be better with high tidal volume ventilation, but this study should not change practice.

To compare the effects of low versus high tidal volume ventilation in pediatric patients with inhalational burns, researchers from a single burn hospital reviewed outcomes for 932 patients with confirmed inhalational injuries between 1986 and 2014. High tidal volume ventilation (mean, 15 mL/kg) was the standard of care from 1986 until 1996; low tidal volume ventilation (mean, 9 mL/kg) has been used since 1996 due to the conventional wisdom that dealing with respiratory acidosis in the short term is superior to pulmonary injury in the long term.

Patients in the high tidal volume group had significantly fewer ventilatory days (mean, 4 vs. 5) and lower incidences of atelectasis (43% vs. 58%) and acute respiratory distress syndrome (11% vs. 15%). The high tidal volume group had a higher incidence of pneumothorax (28% vs. 19%). After adjustment for age and total burned surface area, mortality rates did not differ significantly between the high and low tidal volume groups (15% and 22%).

Comment: The generalizability of this study is limited by its use of a historical control group, as medical practices and therapies have changed over time. Based on this study alone, current practice should not change, but clearly more work is needed to determine the optimal ventilation strategies for pediatric patients with inhalational burns.

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