



High-frequency percussive ventilation improves oxygenation and ventilation in pediatric patients with acute respiratory failure.

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PURPOSE: High-frequency percussive ventilation (HFPV) in pediatrics has been described predominantly in burned patients. We aimed to describe its effectiveness and safety in noninhalational pediatric acute respiratory failure (ARF).

METHODS: We conducted an observational study in a tertiary care pediatric intensive care unit on 31 patients with ARF failing conventional ventilation transitioned to HFPV. Demographics, ventilator settings, oxygenation index, oxygen saturation index, oxygen saturation as measured by pulse oximetry/fraction of inspired oxygen (FiO₂), and PaO₂/FiO₂ were recorded before and during HFPV.

RESULTS: Initiation of HFPV was associated with improvements in oxygenation index, oxygen saturation index, PaO₂/FiO₂, and oxygen saturation as measured by pulse oximetry/FiO₂ as early as 12 hours (P < .05), which continued through 48 hours after transition. Improved oxygenation occurred without an increase in mean airway pressures. Reductions in PaCO₂ occurred 6 hours after initiation of HFPV and continued through 48 hours (P < .01). Improved gas exchange was accompanied by reduced peak-inflating pressures at all time intervals after initiation of HFPV (P < .01). Vasopressor scores were similar before and after initiation of HFPV in patients requiring vasoactive support. Twenty-six (83.9%) of 31 patients survived to hospital discharge.

CONCLUSIONS: In a heterogeneous population of pediatric ARF failing conventional ventilation, HFPV efficiently improves gas exchange in a lung-protective manner.

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