



A prospective, randomized comparison of the Volume Diffusive Respirator vs conventional ventilation for ventilation of burned children. 2001 ABA paper.

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The Volume Diffusive Respirator (VDR) is a high-frequency time cycled pressure ventilator that can ventilate, oxygenate, and promote secretion removal. The VDR provides ventilation at lower airway pressures than those required for conventional ventilation in the pressure control mode (PCV). A prospective, randomized, institutional review board-approved study was conducted comparing the VDR to PCV in burned children with respiratory failure from all causes.

METHODS: Pediatric burn patients requiring ventilation were stratified by presence of inhalation injury and ventilated by VDR or PCV to achieve predefined arterial blood gases.

RESULTS: Sixty-four patients were prospectively assigned ventilator type; 32 to VDR, 32 to PCV. Data are reported as mean + SEM. Patient age was 7.4 + 0.7 years, TBSA was 56 + 3%, and number of patients with inhalation injuries was 55 (86%). Maximum peak inspiratory pressure with the VDR was significantly less than with PCV (30.9 + 0.8 cm H₂O vs 39.5 + 1.8 CmH₂O, P < 0.05) and the best PaO₂/FiO₂ ratio was significantly higher with the VDR compared with PCV (563 + 15 vs 507 + 13, P < 0.05). No patient in the VDR group had evidence of barotrauma compared with two in the PCV group. Five patients in the PCV group died compared with two in the VDR group.

CONCLUSION: Patients ventilated with the VDR required significantly lower peak inspiratory pressure and achieved a significantly higher PaO₂/FiO₂ ratio compared with PCV. This demonstrates the VDR is a safe and effective method of ventilation for pediatric burn patients and it offers advantages when compared with conventional ventilation.

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