



Effect of intrapulmonary percussive ventilation on mucus clearance in Duchenne muscular dystrophy patients: a preliminary report.

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OBJECTIVE: To determine the effects of intrapulmonary percussive ventilation (IPV) on mucus clearance in tracheostomized Duchenne muscular dystrophy patients.

METHODS: We studied 8 patients, 5 of whom had mucus hypersecretion (> 30 mL/d). In a randomized, cross-over study we compared assisted mucus clearance techniques with and without IPV. There were 2 treatment sequences and each patient received 5 consecutive days of each treatment sequence, delivered 3 times a day. One sequence consisted of (1) assisted mucus clearance technique (AMCT, which involves forced expiratory technique and manual assisted cough), (2) endotracheal suctioning, (3) nebulizer administration of 5 mL of 0.9% sodium chloride solution for 5 min, (4) a second AMCT session, (5) endotracheal suctioning, (6) 45 min after the end of the nebulizer treatment a third AMCT session, (7) endotracheal suctioning. The other treatment sequence was the same except that it included IPV during the 5-min nebulizer treatment. The collected secretions were weighed. Vital capacity was measured once, before the treatments. Heart rate, respiratory rate, oxyhemoglobin saturation, end-tidal carbon dioxide, airway resistance, and peak expiratory flow were measured before and at 45 min after the treatments. Mean values were compared using analysis of variance with repeated measures.

RESULTS: In patients with hypersecretion the mean +/- SD weight of the collected secretions was significantly higher with IPV (6.53 +/- 4.77 g vs 4.57 +/- 3.50 g, $p = 0.01$). Heart rate, respiratory rate, oxyhemoglobin saturation, end-tidal carbon dioxide, airway resistance, and peak expiratory flow did not differ statistically between the 2 treatments.

CONCLUSIONS: IPV is a safe airway clearance method for tracheostomized Duchenne muscular dystrophy patients, and this preliminary study suggests that IPV increases the effectiveness of assisted mucus clearance techniques.

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