

Basic Research Overview

High-Frequency Chest Compression: Mechanism of Action/Physiological effects

This study confirms earlier research showing that one of several mechanisms by which High - frequency chest compression (HFCC) significantly enhances secretion clearance is an HFCC-induced expiratory bias in peak flow. These effects do not occur using high-frequency oral oscillations at the mouth (HFO/AO).

Title	King M, Zidulka A, Phillips D, Wight D, Gross D, Chang HK. Tracheal mucus clearance in high-frequency oscillation: effect of peak flow rate bias. <i>Eur Respir J</i> 1990; 3:6-13.
Objective	To investigate whether increases in TMCR in dogs during HFCC is due, in part, to the expiratory bias in peak flow rate (VE/VI greater than 1) that occurs during HFCC.
Method	<p>TMCR in 8 anaesthetized, spontaneously breathing dogs was studied by comparing several randomized maneuvers designed to assess that effect:</p> <ul style="list-style-type: none"> • HFCC applied by means of a thoracic cuff • Symmetric high-frequency oscillation via the airway opening (HFO/AO) <ul style="list-style-type: none"> ○ Applied by means of a piston pump driven by sinusoidal signal ○ With an expiratory bias in peak flow ○ With an inspiratory bias in peak flow • All maneuvers were performed at 13 Hz for 5 minutes and an oscillatory tidal volume of 1.5ml/kg⁻¹ • TMCR was determined by direct bronchoscopic visualization of charcoal particle transport
Results	<ul style="list-style-type: none"> • TMCR with HFCC was 240% greater than control (p < 0.001) • Results were consistent with a previous studies [King, et al., 1983, 1984] • TMCR was NOT increased over control in any of the HFO/AO maneuvers • The increase in TMCR during HFCC is due, in part, to an HFCC-induced expiratory bias in peak flow rate

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