

Letter to the Editor

Response to letter to the editor re ‘The effect of inspiratory rise times on sputum movement during ventilator hyperinflation in a test lung model’

Thank for your letter expressing your interest in this article and proposing an alternative theory to explain the plateau in sputum displacement, despite an increasing expiratory flow bias as the percentage inspiratory rise time increased. The proportion of the mucus layer within the air tube was not measured during this experiment. It is possible that the thickness of the mucus layer gradually reduced below the critical threshold required for two-phase gas–liquid transport during the ventilation hyperinflation breaths, and prevented the expected increase in mucus movement. Consequently, as the article recommended it would be valuable to analyse the impact of increasing the inspiratory rise time during ventilator hyperinflation in a clinical environment to eliminate factors (including mucus variability) that are not captured in this study.

As identified, the aim of this study was not to compare the peak inspiratory flow:peak expiratory flow ratio (PIF:PEF ratio) with the PEF–PIF difference to deduce which one predicts mucus movement more accurately. The increase in porcine tracheal mucus displacement with a PEF–PIF difference of 33 L/min is likely to be similar within humans, nevertheless generated air flow depends upon age and airway diameter. Clearly this is an important area which requires

more clinical investigation to guide best patient care.

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Ethical approval: Ethical approval was not required for this laboratory-based bench study since the study did not involve human participant. The study was registered with Great Ormond Street Hospital for Children NHS Trust and University College London, Institute of Child Health Research Ethics Committee (Research and Development No. 13A12).

Conflict of interest: None declared.

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