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Title: Perflubron enhances mucin plug clearance in vitro in the presence of natural surfactant

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Body: Introduction: Severe acute asthma is characterized by bronchoconstriction in combination with mucous plugs. These mucous plugs prevent effective delivery of aerosolized bronchodilators with potentially fatal consequences. Perflubron is a chemically stable and inert compound that has been used in many clinical applications, including bronchial lavage, liquid ventilation, with no significant toxicity. It is an excellent carrier of respiratory gases and may have mucolytic properties. We developed an in vitro model of airway mucous plug obstruction. We looked at the ability of perflubron to enhance clearance of a mucin plug with and without the addition of endogenous surfactant. Methods: Mucin (M3895) was reconstituted with PBS to a concentration of 150 mg/mL. The mucin was placed between two 2.5% agarose gel plugs and inserted into a siliconized 100 µl capillary tube. The tube was exposed to a respiratory ventilator with a stroke volume of 0.5 mL of air at a rate of 20 strokes/min. The apparatus was connected to 10 cm water column to maintain constant peak pressure. Perflubron and bovine lipid extract surfactant (BLES) were added to the capillary tubes separately and together and their effect on mucin movement rates (mm/sec) analyzed Results:

Conclusion: This study demonstrates that mucin clearance was significantly ($P < 0.001$) increased when treated with PFOB in the presence of surfactant.