Heliox improves pulmonary mechanics in a pediatric porcine model of induced severe bronchospasm and independent lung mechanical ventilation

ABSTRACT

Pediatric porcine models have demonstrated improved pulmonary mechanics, gas flow, and ventilation in response to acute, severe methacholine-induced bronchospasm. Heliox should be considered for the treatment of such conditions, particularly when treating pediatric patients with mechanical ventilation using small artificial airways.

INTRODUCTION

Introduction Heliox is a novel bronchospasm drug that increases the pulmonary mechanics of a porcine model of icterus induced severe bronchospasm (SIB) in a pediatric porcine model of icterus. This study was designed to assess the effect of Heliox on the pulmonary mechanics and pulmonary blood flow in SIB in an animal model of icterus.

Methods:

SIB, a model of icterus, was designed by a paediatric endocrinologist and was an in vitro model of SIB in porcine models of icterus. The model was controlled by the control group. The pulmonary mechanics of SIB were measured using a spirometry machine and the pulmonary blood flow was measured by Despite progress in treating asthma since Barach's first study in 1935, mortality remains high and treatment with heliox has become more common. Bronchodilators and anti-inflammatory agents are now the primary form of treatment, while some patients still require mechanical ventilation due to their inability to respond to aggressive therapy. Mechanical ventilation may result in additional difficulty achieving adequate ventilation. HelioX may be best for intubated patients with severe bronchospasm and small diameter airways by decreasing turbulent flow, improving ventilation, and limit barotrauma. Many animal and human studies have explored the effects of heliox on pulmonary function, but their promising results are often difficult to translate. In our study, we developed a unique model of mechanical ventilation for severe bronchospasm that allows one of the animals' lungs to act as their own control during the same event. This reduces the need for comparison between controls and other systemic variables, allowing us to establish if different biological responses to stress events can occur independently.

CONCLUSION

Heliox demonstrated an improvement in pulmonary mechanics in patients with severe methacholine-induced bronchospasm and a pediatric porcine model of independent lung mechanical ventilation, as measured by helioX at the same ventilator setting. The authors suggest that this type of therapy may be useful for children with small endotracheal tubes, high airway resistance, and delayed progress towards ventilated children.