

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

## ABSTRACT

Heliox administration enhances pulmonary mechanics, gas flow, and ventilation in a pediatric porcine model of severe methacholine-induced bronchospasm and independent lung mechanical ventilation. Pediatric patients with acute, severe bronchospasm that require mechanical ventilation through small artificial airways should be treated with heliox.

## INTRODUCTION

The aspiration of gastric contents can trigger or intensify bronchoconstriction, which is the most well-known pathogenic factor for pneumonia, particularly in patients with ventilator-associated pneumonia (VAP). Intensive care unit (ICU) patients experience frequent aspiration of gastric contents, while those who are intubated and mechanically ventilated often experience it more frequently. Critically ill patients may also develop gastrointestinal tract dysmotility, which is linked to aspartamorous discharge of gases from the gut. Enteral feeding through a nasogastric tube may lead to an increase in gastric volume, reflux, and Gram-negative bacterial overgrowth in the stomach. It is likely that the wide bore nasogastric tubes interfere with the lower esophageal sphincter, leading to aspiration and bacterial contamination of the tracheobronchial tree. Additionally, the position of one or more of these tubes at the same time may be a major risk factor for the aspirating of gastric contents. Aspiration of gastric contents into airways may be prevented by placing them in semirecumbent positions on mechanically ventilated patients, but this issue persists. Despite this, Orozco-Levi and colleagues found evidence that radioactivity count increased significantly after Tc99m isotope instillation through nasogastric tube. The presence of gastroesophageal reflux was not influenced by the position of the body. Conversely, the supine position had a greater impact on the radioactivity count values in bronchial secretions compared to semirecumbency, suggesting that semirecumbent can help prevent part gastric content aspiration. In addition to their position-related effects, erythromycin and cisapride agents may enhance gastric motility, expedite gastrishes, and prevent gastral aspiration. Cisapride is a potent prokinetic medication that enhances the release of acetylcholine from the postganglionic nerve endings of the myenteric plexus without any dopamine antagonism. The effectiveness of cisapride in preventing gastric contents from aspirating through the lungs in patients on mechanical ventilators while still maintaining their semi-recumbent position was evaluated in this study.

## CONCLUSION

Measuring fertilization-induced calcium transients provides a novel experimental technique for studying *C. elegans*. Researchers can now use this technique to detect potential calcium defect in many mutants with known fertilizer defects using forward genetic and gene knockout and RNAi methods. It is recommended that *elegans* permit the identification of proteins that may be involved in this crucial step of embryonic development.