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Respiratory Syndromes; the Source of International Critical Care Health Care Crisis and the Use of Heliox as Rescue Therapy for Asthma-Like Air-Flow Limitations

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Respiratory syndromes caused by viral respiratory infections (VRI) in humans and animals range in severity from the common cold with flu-like symptoms to severe acute respiratory distress syndrome (SARS) that cause respiratory failure (RF). It may trigger bronchiectasis on top of asthma, bronchiolitis, or viral pneumonia that may appear in any multiple combinations and cause RF. All of this can lead to an underestimation that the primary cause of air-flow limitation (AL) is viral induced obstruction. This AL is difficult to ameliorate with traditional β_2 -agonist, airway clearance and lung hyperinflation techniques. Viral identification requires a respiratory viral panel (RVP) via polymerase chain reaction (PCR) to identify the virus or viruses that may be overlooked. Many viral outbreaks are vastly under reported as clinicians feel that the RVP is only an epidemiology numbers. Peri-bronchial wall thickening (PBWT) is a non-specific radiology term used to define airway structure changes, as a source of AL. Chest radiography was notable for; PBWT, Retro-cardiac atelectasis with mucus plugging, or sub segmental atelectasis usually in the left lower lobes (LLL). This can progress to intravascular hemorrhage with cytokine released and acute lung injury. Histopathology study from rat lung tissue is providing valuable information with regard to the inflammatory process and how a virus affects lung structure and provided information on how heliox may attenuate lung function. Viral lung infections are categorized as: influenza, non-influenza or zoonotic that may appear in multiple combinations and different viral pathogens together. For decades, VRI continue to be a recurring challenge and etiology of global health critical care crisis, As the syndromes are not well defined and most treatments ineffective. Globally, H1N1 pandemic 2009 caused over 18,000 deaths and affected 214 countries. Viruses such as enterovirus (EV-D-68) has been having a profound effect globally, responsible for deaths 14 in 2014, and 2600 documented cases in America, and 70 deaths in the Philippines 2011, EV-D68 is associated with flaccid myelitis (non-polio) muscle weakness. Zoonotic viruses such as Coronavirus (HCoV) 229E has been associated with animal / human transmission and linked to Middle East Severe Acute Respiratory Syndrome (MERS). During viral outbreaks, large influx of patients with flu-like symptoms may show up in the emergency department in need of urgent advanced respiratory support; frequent cough, h, dyspnea, wheezing and hypoxemia. It may cause life threatening partial or complete respiratory collapse that may quickly progress to salvage therapies such as; mechanical ventilation, proning, nitric oxide, extracorporeal membrane oxygenation (ECMO). This can lead to SARS and organ failure. There have been many anecdotal reports dating back to 1935 where heliox was used as therapy for RF related to influenza respiratory syndromes. It is inferred that heliox may reduce airway resistance through constricted central airways to act as a bridge support to decrease work of breathing and improve alveolar gas exchange. There is limited data and a lack of formal randomized trials for heliox for the treatment of VRI. Prospective studies and better training is needed for recognition, updated treatment plans and infection control to combat VRI.

Biography:

Sherwin Morgan RRT, RCP is a Registered Respiratory Therapist (RRT) - Clinical Respiratory Care Practitioner (RCP) at The U Chicago Medicine (UCM). In his current role at UCM, he serves as Clinical Practice and Development/Research Coordinator for the Department of Respiratory Care (RCS), Section of Pulmonary and Critical Care. Past position was Associate Director of Clinical Operations RCS. He has been active in the field of RCS for 39 years. He is board certified by the National Board for Respiratory Care (NBRC). He is an active member of the America Association for Respiratory Care (AARC). He has collaborated with many departments at UCM with regard to respiratory care related clinical research projects. He has accumulated more than 45 publications in peer review scientific journals with regards to the new horizons surrounding respiratory care clinical practice. His main focus of study is on respiratory syndromes, inhaled pulmonary vasodilators, helium-oxygen administration, and aerosolized medication drug delivery for adults and small children. The research has taken him to international destinations such as; Vienna Austria (Moderator, Virology Summit 2018), Toronto Canada (Keynote Speaker; Pediatric Pharmacology and Therapeutics) 2018, London, United Kingdom (UK), Berlin, Germany, Speaker and Co-Chairman at the Pediatric Emergency Conference in Atlanta Georgia 2016, and Keynote speaker at the Global Influenza Conference held in Birmingham, UK - 2017. He has presented at multiple different nationally and state organized conferences such as; American Thoracic Society, AARC.