Title of Abstract:

Airway Microbiome Analysis in Preterm Infants with Bronchopulmonary Dysplasia

Name of Abstract Submitter:

Meghali Singhal, MD - Neonatology Fellow

Organization:

University of Irvine, California

Co-Author / Co-Investigators:

Angele Nalbandian2, Fayez Bany-Mohammed2, Cherry Uy2, Katrine Whiteson1, Muhammad Aslam2

INSTITUTIONS (ALL):

1. Molecular Biology and Biochemistry, UC Irvine, Irvine, CA, United States.

2. Pediatrics, UC Irvine, Irvine, CA, United States.

Abstract Description:

Background: Bronchopulmonary dysplasia (BPD) is one of the most common chronic debilitating lung diseases among infants and children. BPD predominately affects preterm infants with high morbidity and mortality. Despite advances in the care of preterm infants, the incidence of BPD remains high. Etiology of BPD is multifactorial with prematurity, infection/inflammation, mechanical ventilation, and maternal chorioamnionitis as the leading causes of the disease. With success in whole human genome sequencing and development of affordable ways to study microbiome and metabolomics in humans, the relationship between diverse microbiome and development of diseases has been established. Limited studies have reported about neonatal microbiota and these are mostly limited to skin and GI tract. Objective: We hypothesized that lung microbiota will provide useful information regarding development and severity of BPD. Our objective was to analyze microbiota within the tracheal aspirate fluid (TAF) of preterm infants with and without BPD to identify specific metabolites unique to development of BPD.

Design/Methods: Infants less than 32 weeks' gestational age and/or less than 1500 gms birth weight who were intubated within the first 24 hours of life were enrolled into the University of California Irvine IRB-approved study. Those with neuromuscular disease, congenital anomalies, or pulmonary hemorrhage were excluded. The TAF sample was obtained at intubation before any exogenous surfactant administration. Samples are currently being analyzed for microbial

community with 16S rRNA sequencing, and for primary metabolites with GC-MS and lipids/polar compounds with LC-MS.

Results: To date, 16 infants have been enrolled into the study and TAF samples collected and processed. The samples are currently being analyzed for the above-mentioned markers and clinical data being collected. 6 of 16 infants have developed BPD. We anticipate the final data results to be available within the next few weeks. This will provide us the opportunity to present this exciting data at the conference.

Conclusion(s): Analysis of lung microbiota will provide useful information regarding the development and severity of BPD. Data analysis is currently underway which will enable further studies to review this important unstudied area.

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