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Megan H. Tucker

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Submitting/Presenting Author (must be a trainee): Megan Tucker
Primary Email Address: mtucker1@cmh.edu

☐ Medical Student
☐ **Resident/Psychology Intern (≤ 1 month of dedicated research time)**
☐ **Resident/Ph.D/post graduate (> 1 month of dedicated research time)**
X Fellow

Primary Mentor (one name only): Venkatesh Sampath
Other authors/contributors involved in project: Hung-Wen Yeh, Daniel Oh, Navin Kumar, Nicole Shaw

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Describe role of Submitting/Presenting Trainee in this project (limit 150 words):
I am the fellow principal investigator on this project along with my faculty principal investigator Dr. Venkatesh Sampath. Together Dr. Sampath and I conceptualized and designed the study. I developed the study objectives and protocols, designed the data collection instruments, and collected the bulk of the data. I performed initial data analysis and interpreted the results. With the assistance of my statistician who performed the full data analysis, Dr. Sampath and I interpreted the results, and I drafted the abstract for this submission.

Background, Objectives/Goal, Methods/Design, Results, Conclusions limited to 500 words

Background: Sepsis is the most common indirect cause of acute lung injury (ALI) in adult and pediatric patients, yet no studies have described this phenomenon in preterm infants. We hypothesize that sepsis-induced ALI occurs in neonates and increases the risk of bronchopulmonary dysplasia (BPD) in preterm infants.

Objectives/Goal: 1) To investigate whether late onset sepsis (LOS) and other systemic inflammatory diseases are temporally correlated with ALI as quantified by pulmonary severity score (PSS) trajectory. 2) To determine the sepsis subtypes associated with the greatest severity of ALI.

Methods/Design: We included infants < 31 weeks gestational age and < 1500 grams with LOS in this retrospective case control study. The PSS was calculated at 72, 48, and 24 hours (hr) prior to, at the time of, and 24, 48, 72, and 168hr after sepsis diagnosis. We further defined rule out (RO) sepsis (blood culture negative; antibiotics continued only 48-72hr), blood culture positive (Cx+) sepsis, necrotizing enterocolitis (NEC), urinary tract infection (UTI), and culture negative (Cx-) clinical sepsis (blood culture negative; antibiotics continued > 6 days; specific lab criteria met). PSS

trajectories for confirmed sepsis events (n=211) and RO sepsis events (n=123) were analyzed for signs of ALI using linear mixed-effects models.

Results: Of those admitted, 168/506 had at least 1 episode of sepsis. There were 211 total episodes of confirmed sepsis analyzed for ALI. The incidence of Cx+ sepsis was 15.6% (Figure 1). Between the baseline window of -72hr to -24hr, infants with RO sepsis had similar PSS scores as infants with confirmed sepsis. There was a significant increase in PSS scores from baseline to 0hr, +24hr, +48hr and subsequent time points with a peak at 0hr. Infants with confirmed sepsis had higher mean PSS scores compared to RO sepsis at +24, +48, +72, and +168hr demarking a distinction in ALI between RO and confirmed sepsis (Figure 2). When analyzed by sepsis subtypes, we observed similar trends with increasing PSS scores across all sepsis phenotypes and with diminishing severity from Cx+ > NEC > UTI > Cx- (Figure 3).

Conclusions: Our study indicates that LOS in neonates is temporally associated with an increase in PSS after sepsis diagnosis, implying ALI. This is the first study to examine and report ALI in relation to postnatal sepsis subtypes in preterm infants. Future studies will examine whether infants who develop sepsis-induced ALI are at increased risk of moderate or severe BPD.