Ascension St. Vincent Research Symposium

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Outcomes of Infants with RSV-associated Respiratory Failure and Positive Tracheal Cultures

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The authors have no conflict of interest.

Background:

- Respiratory syncytial virus (RSV) is a leading cause of pediatric hospital admissions for respiratory distress and failure, requiring intubation and mechanical ventilation.
- Although previous studies investigate antibiotic use in ventilated patients and associated incidence of bacterial co-infection, there is a paucity of literature studying the use of tracheal cultures specifically in RSV-associated respiratory failure and subsequent clinical outcomes.

Objective:

- To compare the length of mechanical ventilation and hospital stay and duration of antibiotics in mechanically ventilated RSV-associated respiratory failure pediatric intensive care unit (PICU) patients with positive vs. negative tracheal cultures

Methods:

- Single-center, retrospective chart review study
- Inclusion criteria: Infants less than 2 years of age admitted to the Ascension St. Vincent PICU between between October to March from 2016 to 2020
- Exclusion criteria: patients requiring ECMO, or with complex medical history including prematurity and pre-existing lung or cardiac disease, or with positive urine or blood cultures, or who received antibiotics prior to obtaining tracheal cultures were excluded.
- Electronic medical record used to obtain demographic data, antibiotic prescription (name, duration of use), level of respiratory support and LOS as well as tracheal culture results (must have been obtained within 6 hours of intubation).
- Data between groups compared using Mann Whitney U tests.

Results:

- 22 patients who were admitted to the PICU due to RSV-associated respiratory failure requiring mechanical ventilation and who had a tracheal culture obtained were included in this study.
- 16 (72.7%) with positive tracheal culture
- 6 (27.3%) with negative tracheal culture

Table 1	Positive Tracheal Culture	Negative Tracheal Culture	p value
Median age at time of PICU admission, months (IQR)	2.88 (1.54-3.81)	2.25 (0.52-12.96)	0.35
Male (%)	10 (62.5%)	2 (33.3%)	0.88
Positive for other virus(es) on testing (%)	7 (46.7%)	2 (40.0%)	1.00

Table 1: Demographic and clinical data of patients with positive and those with negative tracheal cultures.

Table 2	Positive Tracheal Culture	Negative Tracheal Culture	p value
Duration of mechanical ventilation, days (IQR)	8.5 (5.25-12.75)	7.5 (6.5-15.5)	0.51 (U=39)
Length of hospital stay, days (IQR)	15 (10.25-22)	12.5 (10.5-21.25)	0.74 (U=43)
Duration of antibiotics, days (IQR)	6 (5.25-7)	4 (3.25-6)	0.02 (U=17)
Total number of antibiotics prescription over hospital stay (IQR)	1 (1-2)	1 (1-2)	0.84 (U=35.5)

Table 2: Comparison between positive and negative tracheal culture groups.

Discussion:

- The study groups were not significantly different in demographic data.
- Total length of mechanical ventilation, hospital LOS and number/type of antibiotics prescribed were not significantly different between groups
- Significantly shorter duration of antibiotic use in patients with negative tracheal cultures

Limitations:

- A small study size and subsequent uneven study group sizes limited the power of this study.

Conclusions:

- The shorter duration of antibiotic use in patients with negative tracheal cultures is an important aspect for antimicrobial stewardship.
- Further research is needed to investigate, diagnose and treat bacterial co-infection with RSV bronchiolitis-associated respiratory failure.

References

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