Microbial Differences in Tracheal Cultures

Joshua Buan[1], Sandra Cusanero [2], John Biscocho [2]
Respiratory Care Services, Children's Hospital Los Angeles [1]
Nursing Department, Children's Hospital Los Angeles[2]

Background

- Pediatric patients with tracheostomy presenting with suspected respiratory infection symptoms
- Inconsistency in practice between units throughout the hospital whether to change the tracheostomy prior to obtaining tracheal culture
- Purpose: to investigate if there is a significant difference in microbial growth between cultures before and after changing the tracheostomy tube.

Methods

- Quasi-experimental, prospective cohort study
- Tracheal cultures obtained pre- and post-tracheostomy tube change
- Descriptive statistics were used to characterize the sample and organism profiles. Chi-Square analysis using McNemar's test to examine differences in gram-stain results between pre- and post- cultures

Inclusion:
- Under 18 years of age
- Accompanied by consenting caregiver
- Suspected respiratory infection

Exclusion:
- Custom tracheostomy
- Previous enrollment to this study

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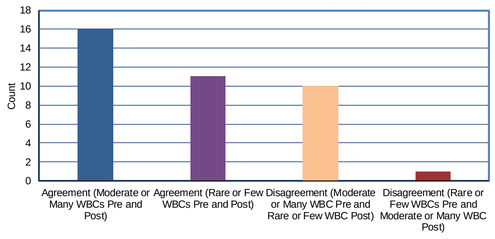
Results

- 60 eligible patients screened, 11 excluded, 49 approached, 7 declined, 42 enrolled, 4 withdrawn, resulting in n=38
- 89.5% had changes in secretions, 68.4% febrile, 47.4% hypoxic, 21.1% required increase in positive pressure ventilation, 50% with chest x-ray abnormalities upon presentation
- Staphylococus aureus and Stenotrophomonas maltophilia were found in both cultures but were significantly less in the post-culture (refer to Table 1).
- The same organisms were not found in 47.4% of the pre- and post- cultures (refer to Graph 2)
- A significant finding was noted when using McNemar's statistic between the amount of WBCs seen in pre- and post- cultures (p=0.012) (refer to Graph 1).
- There were 10 instances where pre-cultures had Moderate/Many WBCs whereas post-cultures resulted in Rare/Few (refer to Graph 1)

Graph 1



Graph 2

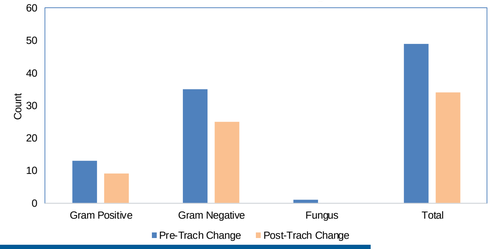


Table 1

	Total Organisms	
	Pre-	Post-
Streptococcus pneumoniae	1	2
Staphylococcus aureas	10	5
Pseudomonas aeruginosa #1	7	8
Pseudomonas aeruginosa #2	3	1
Stenotrophomonas maltophilia	5	0
Klebsiella pneumoniae	1	0
Acinetobacter	2	1
Haemophilus	2	3
Moraxella	6	6
Serratia	3	2
Achromobacter	2	2
Klebsiella oxytoca	0	1
Enterobacter Cloacea	1	0
Streptococcus agalactiae Group B	2	2
Raoultella	1	0
Rhizupus	1	0
Gram neg rods	2	1
Total	49	34

Conclusions and Implications

- Although the study was limited to sample size of 38 pediatric patients, there were differences found in amount of both bacterial growth and detection of specific organisms in specimens obtained pre- and post-tracheal tube change.
- Given the results, it is recommended to change the tracheostomy tube prior to obtaining a respiratory culture.
- With this being the first study in this area, further research is needed to aid in future evidence-based practices.