Posters

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Impact of Early Tracheostomy on Neurodevelopmental Outcome of Infants with Severe Bronchopulmonary Dysplasia Exposed to Postnatal Steroids

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Introduction

- Infants with severe bronchopulmonary dysplasia (sBPD) are at high risk for neurodevelopmental (ND) impairment
- Prolonged assisted ventilation through a tracheostomy in infants with sBPD may improve ND outcome
- There is no consensus on optimal timing of tracheostomy
- There is evidence that tracheostomy performed at <120 days of age improves ND outcome at 18-22 months of age
- Postnatal steroid (PS) use in BPD had been shown to have negative effect on neurodevelopment
- To date, no data has specifically evaluated the impact of early tracheostomy on ND outcome of infants with severe BPD who are exposed to postnatal steroids

Objective

- To compare the cognitive, language and motor scores among infants with sBPD who received Early (ET) versus Late (LT) versus No tracheostomy (NT)
- Secondly, to evaluate if PS had an additive negative effect on ND outcomes

Design/Methods

- IRB approved retrospective review, 2010-2017
- Infants with sBPD divided into ET (< 121 days of age), LT (≥ 121 days) and NT
- Primary outcome: Cognitive, Language and Motor scores at 2-3 years of age (*Bayley's 3rd edition)*
- Secondary outcome: Cumulative PS use of each group
- Statistics: *Kruskal Wallis test* (nonparametric ANOVA)

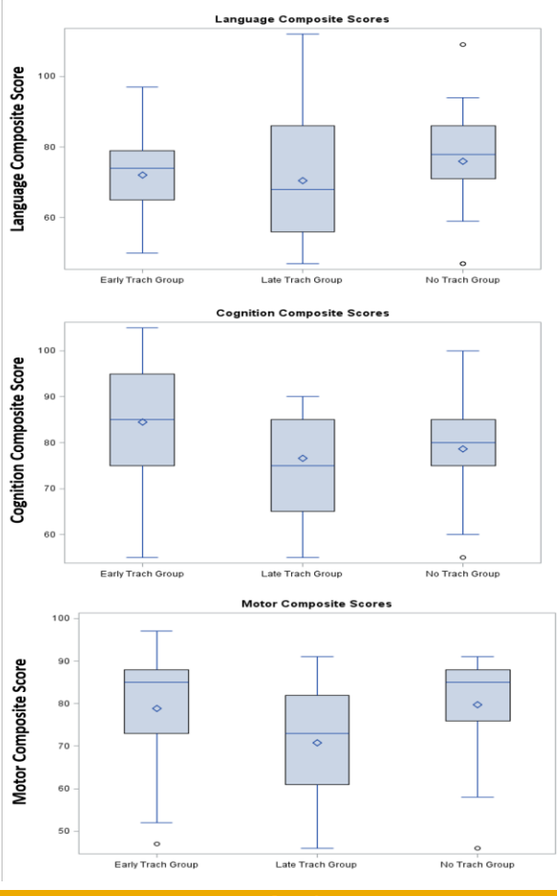
Results

Table 1. Patient Demographics with steroids exposure

Variables	Early Tracheostomy n=22	Late Tracheostomy n=19	No Tracheostomy n=27	*P Value*
Gestational age at birth (weeks)[a]	26(24.00,28.00)	25.00 (24.00, 28.00)	25.00 (24.00, 28.00)	0.967
Birth weight (grams)[a]	840.00 (630.00, 1069.00)	710.00 (600.00, 895.00)	845.00 (710.00, 995.00)	0.138
Gender[b]				< 0.001
Male	12 (54.5%)	8 (42.1%)	10 (37.0%)	
Maternal Race[b]				< 0.001
White	19 (100.0%)	13 (68.4%)	11 (40.7%)	
Black/African American	0 (0.0%)	3 (15.8%)	12 (44.4%)	
Hispanic	0 (0.0%)	0 (0.0%)	3 (11.1%)	
Other	0 (0.0%)	3 (15.7%)	1 (3.7%)	
Unknown	0	0		
Age on admission (days of life)[a]	65.00 (1.00, 92.00)	103.00 (0.00, 129.00)	1.00 (0.00, 32.00)	0.005
Age at tracheostomy (Day of life)[a]	94.00 (82.00, 105.00)	148.00 (134.00, 168.00)		< 0.001
Age at discharge (days of life)[a]	190.00 (159.00, 255.00)	251.00 (210.00, 275.00)	125.00 (110.00, 161.00)	< 0.001
Age at discharge (weeks PMA)[a]	53.50 (49.10, 60.70)	61.50 (56.10, 65.60)	43.86 (41.43, 53.29)	< 0.001
Steroid exposure prior to admission[b]	14 (63.6%)	11 (57.9%)	5 (18.5%)	0.002
Dexamethasone exposure[b]	18 (81.8%)	15 (78.9%)	26 (96.3%)	0.160
Cumulative steroid exposure (hydrocortisone equivalent)[a]	347.20 (132.95, 677.00)	595.05 (67.50, 1213.60)	97.90 (35.60, 237.50)	0.012
PDA[b]	18 (81.8%)	16 (84.2%)	14 (51.9%)	0.022
IVH[b]	6 (27.3%)	8 (42.1%)	10 (37.0%)	0.594

PMA postmenstrual age, *PDA* patent ductus arteriosus, *IVH* intraventricular hemorrhage
[a]Data presented as median (interquartile range)
[b]Data presented as number (percentage)

- Motor composite scores: ET vs LT (median score 85 vs 73, *P 0.028)*
- Trend for better cognitive scores in ET vs LT vs NT but not significant
- No difference in language scores among 3 groups
- LT had the lowest scores in all 3 domains
- LT had the most PS; NT had the least PS



Conclusion

- Early tracheostomy may improve neurodevelopmental outcome in infants with severe BPD particularly in the **motor domain**
- Delaying tracheostomy in severe BPD may predispose to more postnatal steroids exposure and possible worst neurodevelopmental impairment

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