1509. Impact of Respiratory Viral Infection on Outcomes of Congenital Heart Repair Surgery

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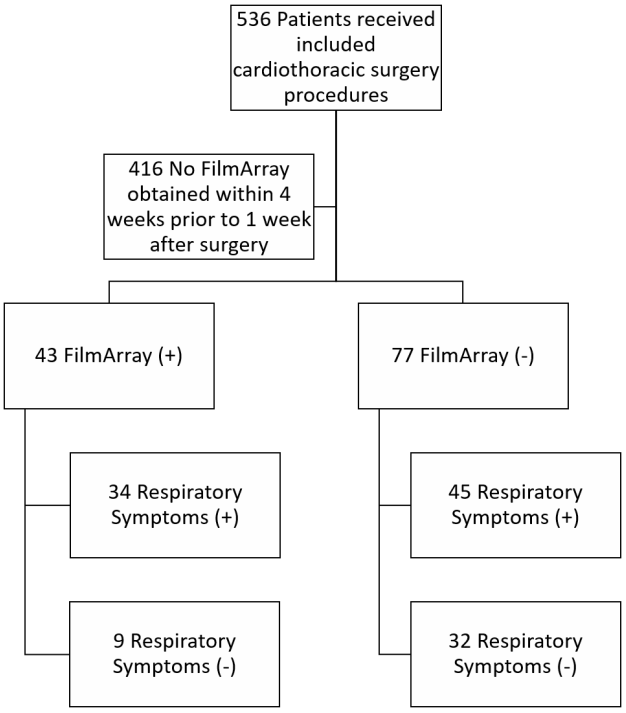
Background. Respiratory viral infections are common in the pediatric population and can range from mild to life-threatening. Given the risk factors that accompany these infections, some pediatric cardiothoracic surgeons in the United States avoid performing surgery for patients with congenital heart disease when there is a possibility of concurrent viral respiratory illness. Studies in this patient population have been limited either by small study populations, or a study focus that is too narrow. The impact of respiratory infections on patient outcomes based on previous literature is also unclear.

Methods. This retrospective chart review study aimed to compare outcomes after congenital heart repair surgery in patients with positive respiratory viral testing to those with negative testing over a five-year period, to determine if there are significant differences related to post-operative hospital course or morbidity.

Patient Inclusion Flowchart



Results. This study included 120 patients, of whom 43 tested positive for respiratory viruses and 77 tested negative. Patients were additionally divided based on the presence or absence of symptoms of respiratory infection, with 79 patients demonstrating respiratory symptoms and 41 who did not. Results demonstrate that negative respiratory viral testing is associated with a significant increase in post-operative ICU LOS ($p = 0.01$), hospital LOS ($p < 0.01$), and duration of post-operative respiratory support ($p < 0.01$), compared to positive testing. Additionally, an absence of respiratory symptoms at the time of testing was associated with a significant increase in post-operative ICU LOS ($p = 0.01$) and hospital LOS ($p < 0.01$), compared to patients who were symptomatic.

Outcomes by Positive vs. Negative FilmArray

Outcomes by Positive vs. Negative Film Array

- Numeric data is expressed as median [25th, 75th percentile] and analyzed using Wilcoxon Rank Sum.
- Categorical data is expressed as count (percent) and analyzed using Chi-Square or Fishers Exact Test (denoted by asterisk (*) on p-value).

	FilmArray Positive (N=43)	FilmArray Negative (N=77)	p-value
ICU Length of Stay (days)	6 [4, 11]	11 [5,28]	0.0104
Hospital Length of Stay (days)	10 [7, 19]	18 [12, 40]	0.0009
Post-Op Duration of Initial Intubation (days)	1 [0, 3]	3 [1, 7]	0.0234
Total post-op duration prior to final extubation/ Trach Placement (days)	1 [0, 6]	7 [2, 19]	0.0005
Total post-op duration resp pressure support (days)	1 [0, 8]	7 [2, 24]	0.0004
Reintubation Required	6 (14)	23 (30)	0.0508
Increase in Home O2 requirement or home vent settings	1 (2)	10 (13)	0.0947*
Mortality within 30 days	0 (0)	1 (1)	1.0000*
Readmission within 30 days of hospital discharge	6 (14)	15 (19)	0.4448
Respiratory Chief Complaints	3	9	
Respiratory Primary Diagnosis	2	7	

Outcomes by Symptomatic vs. Asymptomatic

Outcomes by Symptomatic vs. Asymptomatic

- Numeric data is expressed as median [25th, 75th percentile] and analyzed using Wilcoxon Rank Sum.
- Categorical data is expressed as count (percent) and analyzed using Chi-Square or Fishers Exact Test (denoted by asterisk (*) on p-value).

	Asymptomatic (N=41)	Symptomatic (N=79)	p-value
ICU Length of Stay (days)	13 [5, 37]	7 [4, 13]	0.0136
Hospital Length of Stay (days)	29 [12, 48]	13 [7, 22]	0.0059
Post-Op Duration of Initial Intubation (days)	3 [0, 9]	1 [1, 5]	0.2679
Total post-op duration prior to final extubation/ Trach Placement (days)	7 [1, 24]	3 [1, 8]	0.1213
Total post-op duration resp pressure support (days)	8 [2, 29]	3 [1, 9]	0.0580
Reintubation Required	11 (26.8)	18 (22.8)	0.6235
Increase in Home O2 requirement or home vent settings	5 (12.2)	6 (7.6)	0.5075*
Mortality within 30 days	0 (0)	1 (1.3)	1.0000*
Readmission within 30 days of hospital discharge	10 (24.4)	11 (13.9)	0.1524

Conclusion. These results suggest that negative respiratory viral testing or lack of respiratory infectious symptoms should not be a reassuring factor in patients scheduled for repair of congenital heart disease, and positive testing does not appear to result in worse outcomes after surgery. Based on this data, we would recommend that respiratory viral testing should not be a routine component of preoperative planning for patients scheduled to undergo congenital heart repair surgery, which would reduce the burdens of unnecessary testing and delays in definitive heart repair.

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1510. Infant Pneumonia and Subsequent Risk of Chronic Respiratory Disorders

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Session: P-68. Respiratory Infections - Viral

Background. Community-acquired pneumonia (CAP) in infancy (i.e., among children aged < 2 years) may have long-term consequences for the rapidly developing lung. We examined the impact of pneumonia in infancy on subsequent respiratory health.

Methods. A retrospective matched-cohort design and data from Optum's de-identified Integrated Claims-Clinical dataset (2009-2018) were employed. Study population comprised children who were hospitalized for CAP before age 2 years ("CAP patients") as well as matched comparators without evidence of pneumonia before age 2 years ("comparison patients"). CAP patients and comparison patients were matched (fixed 1:5 ratio, without replacement) using estimated propensity scores and a nearest-neighbor approach; those with evidence of selected medical conditions (e.g., extreme prematurity, congenital diseases, respiratory diseases) before age 2 years were excluded. Study outcomes included recurrent pneumonia and a composite of asthma, recurrent wheezing, and hyperactive airway disease. Rates of study outcomes from age 2 to 5 years were estimated for all CAP and comparison patients as well as subgroups of CAP patients (and corresponding comparison patients) stratified by etiology (bacterial, viral, unspecified).

Results. Study population totaled 1,343 CAP patients and 6,715 comparison patients. CAP patients and comparison patients were well-balanced on their baseline characteristics and mean duration of follow-up was 757 and 729 days, respectively. Rates of chronic respiratory disorders from age 2 to 5 years were significantly higher among CAP patients versus comparison patients. Analyses of subgroups stratified by etiology demonstrated higher rates of study outcomes among CAP patients across all strata.

Rates of recurrent pneumonia and a composite of asthma, recurrent wheezing, and hyperactive airway disease from age 2 to 5 years among CAP patients and matched comparison patients

Table. Rates of recurrent pneumonia and a composite of asthma, recurrent wheezing, and hyperactive airway disease from age 2 to 5 years among CAP patients and matched comparison patients

	No. of Patients	No. with Disorder	Rate per 100K	Rate per 100K PYs	Relative Rate (95% CI)
Recurrent Pneumonia					
CAP Patients	1,343	51	3,797	1,833	6.5 (4.2 - 10.1)
Bacterial	241	9	3,734	2,006	7.1 (2.8 - 12.9)
Viral	362	11	3,039	1,440	5.1 (2.4 - 9.5)
Unspecified	740	31	4,189	1,974	7.0 (4.3 - 11.3)
Comparison Patients	6,715	38	566	284	---
Composite*					
CAP Patients	1,343	170	12,658	6,109	3.5 (2.9 - 4.3)
Bacterial	241	27	11,203	6,018	3.5 (2.3 - 5.0)
Viral	362	50	13,812	6,544	3.8 (2.7 - 5.0)
Unspecified	740	93	12,568	5,922	3.4 (2.7 - 4.2)
Comparison Patients	6,715	231	3,440	1,724	---

*Composite measure includes asthma, recurrent wheezing, and hyperactive airway disease

Conclusion. Infant CAP foreshadows an increase in subsequent risk of chronic respiratory disorders. Further studies are needed to determine whether this elevated risk is due to infant pneumonia or whether infant pneumonia is a marker of at-risk children.

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