UTILIZATION AND IMPACT OF RAPID RESPIRATORY VIRUS PANEL TESTING ON EVALUATION AND MANAGEMENT OF CHILDREN SEEN IN A PEDIATRIC EMERGENCY DEPARTMENT

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Background

- Symptoms associated with viral respiratory illness often prompt evaluation for bacterial illnesses
- Rapid, point of care testing for RSV and influenza has been associated with reductions in resource utilization in the pediatric emergency department
- Less is known of the impact of a diagnosis of other viral respiratory pathogens on clinical care
- Many prior studies have assessed the effects of having the test performed, rather than the impact of the result itself

Objectives

- Describe use of multiplex PCR testing for respiratory viral pathogens (RVP) excluding RSV and influenza in Ped ED setting
- Describe distribution of respiratory viral pathogens, other than RSV and influenza
- Assess impact of a positive test result on resource utilization (blood, urine, CSF cultures; chest x-ray, antibiotic administration

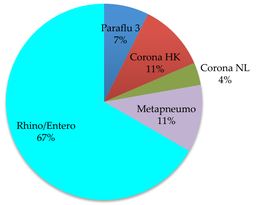
Methods

- Subjects: all children < 18 years of age seen in Ped ED from 12/11 -4/12 who had RVP performed. Subjects + for RSV and/or flu excluded
- RVP: multiplex PCR (Film Array, BioFire Diagnostics) detects influenza A and B viruses, RSV, parainfluenza viruses 1-4, coronaviruses HKU1 and NL63, human metapneumovirus, rhinovirus/enterovirus, and adenovirus with < 2 hour turn around time
- Cases = subjects < 2 years of age with positive RVP results
- Controls = subjects < 2 years of age with negative RVP results
- Outcomes: blood, urine, CSF cx, chest x-rays, antibiotic (IV or PO in hospital) obtained from clinical data warehouse and associated with ED visit by PATCOM number

Results

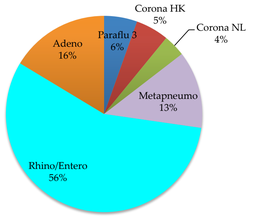
Distribution of viral pathogens by age group

N=27/48



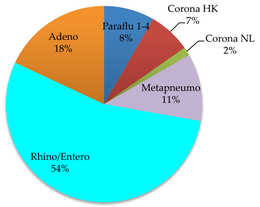
≤ 3 mos

N=55/73



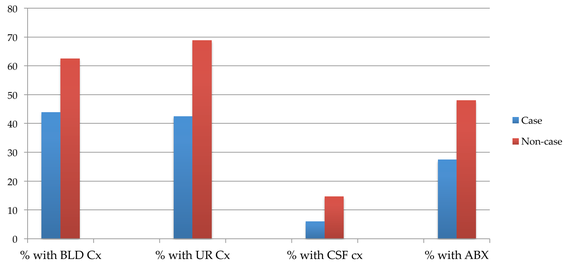
4 mos -≤ 2 years

N=72/109

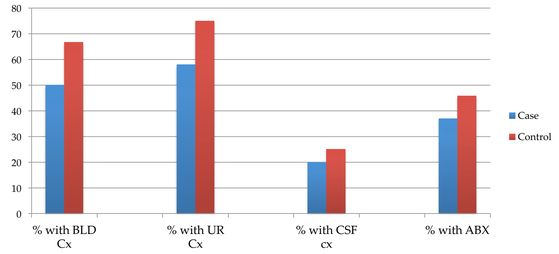


2 - 18 years

Percent of children < 2 years with test or antibiotics



Percent of infants ≤3 mos with test or antibiotics



Odds of having the test or treatment in cases vs. controls

	OR	95% CI
Blood culture	0.47	0.22 – 1.00
Urine culture	0.33	0.15 – 0.74
CSF culture	0.52	0.16 – 1.68
CXR	1.21	0.58 – 2.54
Antibiotics	0.41	0.18 – 0.89

Results

- 154/230 (67%) children <18 yrs who did not have influenza or RSV tested positive for another respiratory virus
- Distribution of viral pathogens was similar except for absence of adenovirus in children ≤3 mos of age
- Rhino/enteroviruses predominate in all age groups
- Cases were less likely to have blood or urine cultures performed
- Cases were less likely to receive antibiotics
- 8% of cases and 15% of controls had lumbar puncture performed
- Infants <3 mos with a positive RVP were just as likely to have blood, urine, and CSF cultures, and to receive antibiotics as those with a negative result

Conclusions

Rapid molecular testing for respiratory viral pathogens has the potential to reduce resource utilization in young children seen in a pediatric ED setting .

Future Directions

- Evaluate resource usage in additional seasons
- Evaluate resource utilization by pathogen
- Examine cost effectiveness of rapid RVP diagnosis

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