737. The Prevalence of Diagnosed Chronic Lung Disease in US Infants by Gestational Age: Implications for RSV Policy

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Background. Perinatal chronic lung disease (CLD), previously referred to as bronchopulmonary dysplasia (BPD), is associated with preterm birth and occurs rarely among term infants. Children with CLD are at elevated risk for severe RSV disease in the first 2 years of life. Definitions of CLD/BPD identify infants who require supplemental oxygen at 28 days of life or 36 weeks postmenstrual age, with no restriction by gestational age (GA) at birth. However, the AAP Committee on Infectious Disease guidance does not recommend RSV immunoprophylaxis for infants with CLD born at ≥32 weeks gestational age (wGA), even though infants with CLD/BPD up to 41 wGA were included in pivotal efficacy studies. This study determined the prevalence of diagnosed CLD in US infants as a function of wGA at birth and the number of infants with CLD born at ≥32 wGA.

Methods. The Kids' Inpatient Database (KID) is a nationally representative survey conducted every 3 years in the United States. Birth hospitalization data from KID were utilized to estimate the prevalence of CLD (ICD-9 = 770.7) among US infants in 2003–2012 overall and as a function of coincident codes for GA (ICD-9 = 765.21–765.29, reported in 2-week intervals). The prevalence of CLD among 32 wGA infants was imputed based on the distribution of CLD cases as a function of wGA. KID data from 2015 were not available due to the transition to ICD-10 coding.

Results. A total of 31,984 infants had a CLD diagnosis across the 4 years, representing 0.2% of US births. The prevalence of CLD declined from 20.8 to 19.5 per 10,000 between 2003 and 2012. Of those, 25,554 infants with CLD (80%) had GA coded in the database. The percentage of CLD infants born at <27 wGA increased from 44% in 2003 to 52% in 2012, whereas the percentage at ≥29 wGA decreased from 27% to 21% (figure). Overall, the percentages born at 31–32, 33–34, and >34 wGA were 5.7%, 2.2%, and 1.2%, respectively. An estimated 5.7% of infants with CLD were born at ≥32 wGA, representing 0.9 of every 10,000 US births or ~350 infants annually.

Conclusion. Fewer than 400 infants are born at ≥32 wGA and diagnosed with CLD annually in the United States. The rationale for excluding this small but high-risk group of infants from the population recommended for RSV immunoprophylaxis is not clear.

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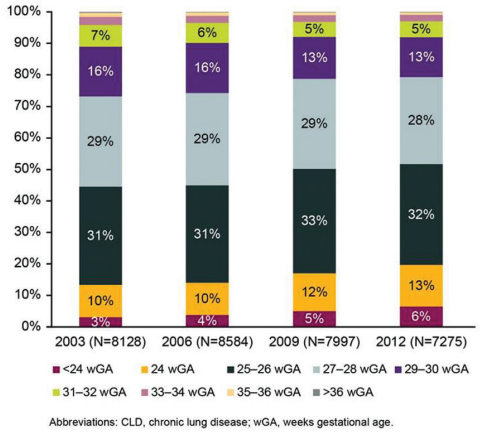
Figure. Distribution of US Infants Diagnosed with CLD by Gestational Age by Year



Abbreviations: CLD, chronic lung disease; wGA, weeks gestational age.

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738. Role of Respiratory Syncytial Virus and *Mycoplasma pneumoniae* in Pediatric Community-Acquired Lower Respiratory Tract Infections

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Background. Respiratory syncytial virus (RSV) infection is a major cause of serious lower respiratory disease in infancy and early childhood and *Mycoplasma pneumoniae* (*M. pneumoniae*) is a common cause of respiratory tract infections in all age groups. This study was conducted to determine the role of RSV and *M. pneumoniae and* in pediatric lower respiratory tract infections employing serological tests, polymerase chain reaction (PCR) and reverse transcriptase PCR analysis.

Methods. In this prospective study, 75 children aged 1 month to 5 years with acute lower respiratory tract infections (LRTIs) were investigated. Paired serum samples were obtained on admission and after 4–6 weeks to assay for *M. pneumonia* antibodies. Nasopharyngeal aspirates were obtained for the detection of RSV antigen by using the immunochromatographic test, reverse transcriptase-polymerase chain reaction (RT-PCR) for RSV and *M. pneumoniae by PCR.*

Results. RSV infection was positive in 20(60.60%) children aged <1 year and 13 (39.40%) aged 2–5 years, the difference being statistically insignificant ($P = 0.360$). *M. pneumoniae* infection was documented in a 15(57.6%) children aged <1 year age and 11(42.4%) in age 2–5 years which was statistically significant($P = 0.026$). Clinical and radiological features among RSV and *M. pnemoniae* positive and negative cases were comparable. Thirty (40%) children were positive for RSV antigen and by RT-PCR and 3(12%) only by RT-PCR. Serological evidence of *M pneumoniae* infection was documented in 24(32%) children. *M. pnemoniae* PCR was positive in 8 (10.66%) patients. Together, serology and PCR detected *M. pneumoniae* in 26(34.66%) children. Considering RT-PCR as a diagnostic standard, the sensitivity of RSV antigen by immunochromatography was 90.90%, specificity 100%, positive predictive value 100% and a negative predictive value of 93.3%.The sensitivity of *M. pneumoniae* serology was 75%, specificity 73.3%, positive predictive value 25% and a negative predictive value of 96% considering PCR as a diagnostic standard,.

Conclusion. Our data underline the role of RSV and *M. pneumoniae* as the major cause of community-acquired lower respiratory tract infections in children aged <5 years.

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739. Middle East Respiratory Syndrome Coronavirus Infection Profile in Qatar: A 7-Year Retrospective Study

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Background. A deadly zoonotic *Middle East respiratory syndrome coronavirus* (*MERS-CoV*) had emerged over the last 7 years in the Arabian Peninsula. As of February 28, 2018, 2,182 cases of *MERS-CoV* infection (with 779 deaths) in 27 countries were reported to WHO worldwide. The objectives of this study were to identify the clinical and epidemiological characteristics of *MERS-CoV* infection as well as determine its clinical outcome.

Methods. This was a retrospective-observational study of all laboratory confirmed cases of *MERS-CoV* infection conducted at the main seven hospitals in the State of Qatar from January, 2012 to April 2018. We used the Fast Track diagnostics real-time reverse-transcription polymerase chain reaction (rRT-PCR), targeting the upE and ORF1a genes respectively. Demographics, clinical information, potential contacts and probable risk factors were collected and analyzed by standard statistical methods.

Results. The mean annual incidence was 1.7 per 100,0000 person-years. Among the 24 confirmed cases of of *MERS-CoV*, males constituted the vast majority of cases (23 males) with a median age of 52 years (range 22–74). Fifty percent of the cases were Qatari and 42% reside in the same region. 67% of the cases had contact with camels, and 21% had contact with *MERS-CoV*-infected patient. Thirty-eight had travel history within 2 weeks of symptoms onset to the Kingdom of Saudi Arabia. Fifty percent were smokers and 42% had comorbidities.

The median symptoms duration was 4.5 days. Most of the patient presented with flu-like symptoms, were fever was the most common presentation, followed by cough, SOB, diarrhea, abdominal pain and headache, 96%, 83%, 33%, 8%, 8% and 4%, respectively. All patients were admitted to a tertiary hospital with a median hospital stay 41 days (8–97). Forty-five percent patients developed severe sepsis with multi-organ failure and needed ICU admission. Fifty percent patients developed acute kidney injury, 29% patients were on hemodialysis and 16% needed extra-corporeal membrane oxygenation. Thirty-three percent patients died. The rest of patients had recovered from the infection and discharged home. Among those who died all had one or more comorbidities.

Conclusion. *MERS-CoV* infection is a rare infection in the State of Qatar, seen in both Qataris and expatriates with and without travel history. The infection in patients with comorbidities carries high mortality.

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740. Impact of the 2014 American Academy of Pediatrics Guidance on Respiratory Syncytial Virus Hospitalization Rates for Preterm Infants <29 Weeks Gestational Age at Birth: 2012–2016

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Background. In 2014, the American Academy of Pediatrics stopped recommending RSV immunoprophylaxis (RSV IP) for otherwise healthy infants 29–34 weeks gestational age (wGA), while continuing to recommend RSV IP for infants born at <29 wGA. The decline in RSV IP and associated increase in RSV hospitalizations (RSVH) among infants 29–34 wGA have been described previously, but potential effects of the 2014 guidance change on preterm infants <29 wGA are unknown. This study compared 2012–2014 and 2014–2016 outpatient RSV IP use as well as RSVH rates relative to term infants among otherwise healthy <29 wGA infants.

Methods. Infants born from July 1, 2011 to June 30, 2016 were followed from birth hospitalization discharge through their first year of life in the MarketScan Commercial (COM) and Multistate Medicaid (MED) databases. DRG and ICD codes identified term and <29 wGA infants at birth. RSV IP receipt was derived from pharmacy and outpatient medical claims (inpatient RSV IP data were unavailable). RSVH were derived from inpatient medical claims. RSVH IP use and RSVH were assessed across three chronologic age (CA) groups: <3 months, 3–<6 months, and 6–<12 months. RSVH rate ratios for 2012–2014 and 2014–2016 were calculated for <29 wGA infants using healthy term infants 0–<12 months of age as a reference category.

Results. Outpatient RSV IP receipt fell after 2014 for <29 wGA infants across all CA categories, with the greatest decline observed among infants <3 months CA (Table 1). Greater RSVH rates for <29 wGA infants relative to term infants were observed after 2014 (Figures 1 and 2), with infants <3 months CA experiencing the greatest percentage increases in relative RSVH risks.

Conclusion. Outpatient RSV IP decreased and RSVH relative to term infants increased among otherwise healthy <29 wGA infants following the 2014 policy change, even though RSV IP continued to be recommended. The effects were greatest for infants <3 months CA and those insured by Medicaid.

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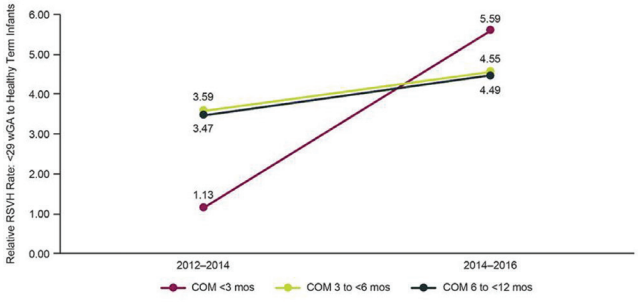
Table 1. Percentage of <29 wGA Infants Receiving Outpatient RSV IP in 2012–2014 vs. 2014–2016

	Commercial			Medicaid		
	2012–2014	2014–2016	% Decline	2012–2014	2014–2016	% Decline
<3 months, %	19.8	10.5	46*	14.6	9.3	36*
3 to <6 months, %	46.4	43.3	7	43.0	32.8	24*
6 to <12 months, %	47.8	42.3	12*	48.2	39.1	19*

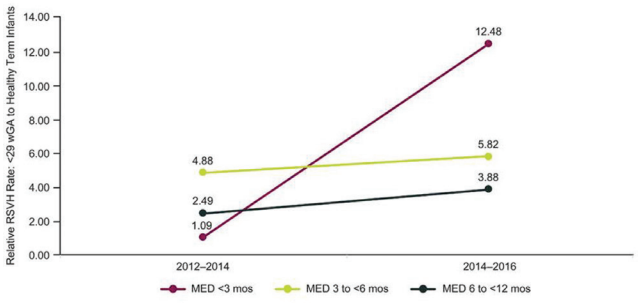
* *P*-value < 0.05.

Figure 1. Rates of RSVH Among Commercially–Insured <29 wGA Infants Relative to Healthy Term* Infants 0 to <12 mos



*Absolute rates: 2012–2014, 2014–2016 (0.728, 0.611).
Abbreviations: COM, commercial; RSVH, respiratory syncytial virus hospitalization; wGA, weeks gestational age.

Figure 2. Rates of RSVH Among Medicaid–Insured <29 wGA Infants Relative to Healthy Term* Infants 0 to <12 mos



*Absolute rates: 2012–2014, 2014–2016 (1.262, 0.859).
Abbreviations: MED, medicaid; RSVH, respiratory syncytial virus hospitalization; wGA, weeks gestational age.

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741. Impact of Adenovirus Co-detections on Illness Severity

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Background. Human adenovirus (AdV) is a common pathogen among children with acute respiratory illnesses (ARI) and is often associated with co-detection with other respiratory viral pathogens. We sought to compare demographic and clinical characteristics in children with ARI who had single-AdV vs. AdV-co-detection with other viruses.

Methods. Children <18 years with fever and/or ARI were enrolled in Vanderbilt Children's Hospital inpatient setting from 2015 to 2018 and emergency department from 2016 to 2018. Interviews were conducted using standardized case report forms. Nose and throat swab specimens were collected and tested by RT-qPCR for common respiratory pathogens (AdV, RSV, HRV, hMPV, PIV1–4 and Influenza).

Results. Of 2,740 ARI cases, 174 were positive for AdV [88 (51%) single detection], with 53% male, 47% White, 36% Black, 30% Hispanic and median age of 17.2 months. Co-detected pathogens in AdV-positive specimens were RSV(15%), HRV(14%), influenza(5%), PIV1(1%), PIV2(0.6%), PIV3(1.7%), and PIV4(0.6%), hMPV(3%), >1 co-pathogens(9%). Subjects with single-AdV detection were more likely to have an underlying medical condition (42% vs. 24%, $P < 0.05$). Table 1 compares clinical presentation and severity of single-AdV and AdV-co-detection cases.

Table 1:

	AdV-Single *n* = 88 (%)	AdV-co-Detection *n* = 86 (%)	*P*-Value*
Fever	78(89)	71(83)	0.25
Cough	63(72)	79(92)	<0.01
Dyspnea	38(43)	57(66)	<0.01
Wheezing	36(41)	50(58)	<0.05
Chest in-drawing	8(9)	29(34)	<0.01
Nasal congestion/runny nose	71(81)	79(92)	<0.05
Diarrhea	13(15)	27(31)	<0.01
Supplemental oxygen	5/88(6)	23/84(27)	<0.01
Admitted (2015–2016)	6/6(100)	20/20(100)	—
ICU Admission (2015–2016)	1/69(16.7)	4/20(20.0)	0.86
Admitted (2016–2018)	15/82(18)	20/66(30)	0.09
ICU admission (2016–2018)	1/15(6.7)	2/20(10.0)	0.72

Conclusion. Patients with single-AdV detection were less likely to present with ARI symptoms and require oxygen, but were more likely to have underlying medical conditions compared with AdV-co-detection. Further studies to type AdV isolates will help elucidate the role of specific adenovirus types associated with co-detections and illness severity and inform epidemiological information for future vaccine initiatives.

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742. "Troponin Leaks" in Patients with Acute Respiratory Viral Infections Enrolled in SUPERNOVA: A Marker of Worse Clinical Outcomes

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Background. Cardiac troponin I (cTnI) is a specific marker of cardiac muscular injury. Many patients hospitalized with acute respiratory illness (ARI) have elevated cTnI levels but do not meet EKG criteria for an acute ischemic cardiac event. Troponin leaks could be due to demand ischemia or acute inflammation of the myocardium. We hypothesized that patients with viral ARI and elevated cTnI have worse cardiopulmonary outcomes than those with viral ARI and normal cTnI.

Methods. From November 11, 2016–September 30, 2017 nasopharyngeal swabs from patients enrolled in SUPERNOVA ARI Study, a CDC/2-VA site, active surveillance platform to evaluate the incidence of viral infection in patients hospitalized with symptoms and/or signs of ARI, were tested using a FilmArray Respiratory Panel. Based on detection of any virus, patients were categorized as positive (vPCR+) or negative (vPCR–). Patient enrolled at the Houston site with cTnI obtained <48 hours of