Results. Of 958 patients with NPA specimens, 591 (61.7%) were positive for ≥ 1 pathogens; human rhinovirus (HRV) was the most prevalent (29.4%). None-HRV infection (RD -12.9%; 95% CI -19.5%–6.3%) had a decreased risk of bacterial infection (OR 0.78 [95% CI 0.65–0.95], but unlikely on a clinical level). Similarly, UTI risk in infants 29–90 days did not decrease the risk for UTI (RD 0.87 [95% CI 0.58–1.29]; risk of IBI was statistically lower with HRV detection [OR 0.78 (95% CI 0.65–0.95)], and of INF and PIV specifically (RD 24.9%; 95% CI 4.7%; 45.1% and RD 34.1%; 95% CI 7.5% (60.7%) were positively associated with treatment failure.

Conclusion. In this large cohort of infants with moderate or severe exacerbation, no single respiratory pathogen was associated with higher severity on presentation. However, in addition to any pathogen and non-HRV infection, INF and PIV were specifically associated with higher treatment failure in the ED, supporting the need for influenza prevention, pediatric identification at presentation and exploration of pathogen-therapy interaction.

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2339. Human Rhinovirus Detection by PCR in Febrile Infants and Risk of Concomitant Bacterial Infection
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Background. Studies have shown that well-appearing febrile infants (FI) with viral respiratory infections have a reduced risk of bacterial infections (BI); urinary tract infection, bloodstream infection, meningitis). Respiratory testing by PCR allows detection of respiratory viruses which may help to prevent varicella outbreaks and achieve effective control of the disease.

Methods. We identified well-appearing FI 1-90 days old within Intermountain Healthcare evaluated in the ED or inpatient setting (IP) with viral respiratory testing by PCR (RVP/PCR) from August 2007 to August 2016. Respiratory viruses detected by RVP/PCR included: adenovirus, coronavirus, human metapneumovirus, influenza A/B, parainfluenza 1-4, RSV and HRV. We used relative risk (RR) to compare the risk of BI for infants with HRVs vs. non-HRV viruses detected. Similarly, we used RR to compare risk of UTI and invasive bacterial infection (IBI; bacteremia and meningitis) for infants with HRV detected compared with those who were virus negative.

Results. 10,964 FI were evaluated in the ED/IP during the study period. 4037 (37%) had RVP/PCR and were included. 2212 (55%) FI were positive for a respiratory virus and 73% were 29-90 days old. HRV was detected alone in 1392 (34%) and non-HRV viruses were detected in 620 (20%). The overall frequency of BI in the cohort was 9.5%. BI were more likely to have concomitant viruses than those non-HRV viruses [7.8% vs. 3.7% P < 0.0001; RR 2.12 (95% CI, 1.43–3.15)]. When compared with virus-negative HRV, HRV detection in infants 1-28 days did not decrease the risk for UTI [RR 0.87 (95% CI 0.58–1.29)]; risk of IBI was statistically decreased [RR 0.52 (95% CI 0.34–0.80)]. With possible clinical relevance.

Conclusion. HRV detection was common in young febrile infants. Infants with HRV were at higher risk of BI than infants with non-HRV infection. Detection of HRV did not meaningfully change risk for UTI at any age or meaningfully impact risk of IBI in infants < 30 days. HRV detection may be associated with a decreased risk for IBI in infants 29-90 days.

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2340. A Varicella Outbreak Among Preschool Children Despite One-dose Vaccination
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Background. In Turkey, a single-dose varicella vaccine was introduced into the National Immunization Program in 2013. Before this implementation, varicella vaccine had been available in the private sector since 2000. However, varicella outbreaks continued to occur in preschools and elementary schools. We investigated a varicella outbreak to estimate the effectiveness of one-dose varicella vaccine and to evaluate potential risk factors for breakthrough disease.

Methods. This study was carried out during a varicella outbreak in 3 preschools in Izmir, Turkey, in April 2016. Using questionnaires, data including children's medical and vaccination history were collected from their parents. Vaccination status of children was also verified with immunization records. Attack rates in vaccinated and unvaccinated children were calculated and the analysis of vaccine effectiveness and of risk factors for breakthrough disease were conducted. Vaccine effectiveness was calculated using the equation: (attack rates in vaccinated children-attack rates in unvaccinated children) x 100%.

Results. A total of 124 children were enrolled in the study. Of the 124 children, 77 (62%) had received 1-dose varicella vaccine before the outbreak. Varicella developed in 34 of 124 children during the outbreak, and 18 of them (53%) had breakthrough varicella. The attack rate was 23.4% among vaccinated children and 34% among unvaccinated children. The effectiveness of single-dose varicella vaccine was 33.6% against varicella disease of any severity and 82.3% against moderate or severe varicella. Children vaccinated 5 or more years before the outbreak had 3.5 times the risk of disease than those who had been vaccinated more recently (OR 3.5 (95% CI 1.08–11.5)); P = 0.046). Age at vaccination (<15 months vs.>15 months) and the brands of varicella vaccine were not associated with the increased risk of breakthrough varicella.

One-dose varicella vaccine is not sufficient to prevent school outbreaks. For this reason, varicella outbreaks continued to occur in schools and kindergartens among healthy vaccinated children in Turkey. A 2-dose varicella vaccination program may help to prevent varicella outbreaks and achieve effective control of the disease.

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