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**Methods.** We retrospectively reviewed EMRs of all infants ≤ 60 days undergoing sepsis evaluation with a positive HPeV PCR from any site between July 2013 and September 2016. All available HPeV CSF, blood, and superficial site specimens were typed by PCR or Sanger sequencing (types assigned per GenBank\(^\text{TM}\)).

**Results.** Of 1,265 patients tested, 131 (10%) were positive for HPeV in at least one site, of which 100 had available isolates for genotyping. Median age was 30 days (IQR 19–39), 55% were male. HPeV3 was identified in 87 (87%), HPeV4 in 6, HPeV0 in 5, and no plexovirus or HPeV6 were identified in one infant each. For comparisons we grouped types 1, 4, 5 and 6 into HPeV0 (n = 13). The circulation of HPeV0 peaked in the months of July to October independent of the type. However, while HPeV0 were identified only in second half of the year, HPeV3 was detected year round with a higher frequency (P < 0.005). There were no significant differences between HPeV3 vs. HPeV0 in age, gender, presenting symptoms, length of stay, PICU admission and ANC. ALT values were higher in HPeV0 patients (P < 0.01). CSF indices were also similar in both groups. Of the positive CSF isolates for HPeV3, 43% had no pleocytosis; all CSF isolates typed were HPeV3 in CSF. HPeV3 was found in blood and superficial sites. HPeV0, 5 and 6 were only found in superficial sites and more commonly with coinfections (enterovirus [EV], rhinovirus, group B streptococcus). There were 4 PICU admissions, 3 of them had HPeV3 and 1 had HPeV4 (patient also had Rhinovirus/EBV bronchiolitis). All patients recovered at the time of discharge.

**Conclusion.** HPeV3 was commonly identified in infants ≤ 60 days undergoing sepsis evaluation. HPeV3 was the most common type in this age group. HPeV4 also caused viremia, while other less frequent types were identified with coinfections.

**Disclosures.** O. Ramilo, Abbvie; Board Member, Consulting fee; Regeneron, Board Member, Consulting fee; Janssen; Board Member and Investigator, Consulting fee and Research grant; NIH; Grant Investigator, Research grant; A. Leber, BioFire Diagnostics: Research Contractor and Scientific Advisor, Research support, Speaker honorarium and Travel expenses

### 2332. Can We Distinguish between Human Parechovirus Type 3 and Enteroviruses Infection in Neonates and Young Infants Based on their Clinical and Laboratory Findings?

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**Background.** Human parechovirus type 3 (HPeV3) and enteroviruses (EVs) are the major viral pathogens causing severe diseases in neonates and young infants. Although two infections typically occur in summer, and initial clinical presentations are similar, differences in clinical and laboratory characteristics of HPeV3 and EV infections are not well described.

**Methods.** From January 2014 to December 2016, we prospectively obtained serum and/or cerebrospinal fluid (CSF) samples from febrile neonates and young infants ≤ 4 months suspecting sepsis and meningoencephalitis in Niigata, Japan. RNA/DNA were extracted from the samples and viral etiologies including HPeV3, EVs, and/or herpes simplex virus were tested using the real-time PCR, followed by genetic sequencing and typing. The comparison was made between HPeV3- and EVs-infected patients based on their medical records and subsequent questionnaires using appropriate statistical analyses.

**Results.** In total, we obtained 212 serum and 170 CSF samples from 222 patients. HPeV3 and EVs were detected for 56 (25%) and 43 patients (19%) (Figure), and their median ages were 29 and 24 days (P = 0.58), respectively. HPeV3-infected patients were presented with higher median body temperature (38.9 °C vs 38.5 °C, P < 0.001), heart rates (184/minute vs. 161/minute, P = 0.002), peripheral coldness (72% vs. 34%, P < 0.001), skin motility (65% vs. 23%, P < 0.001), and grunting (22% vs. 5%, P = 0.014) than EVs-infected infants. Additionally, systemic inflammatory response syndrome (SIRS) was more frequently observed in HPeV3-infected patients than in EVs-infected patients (82% vs. 58%, P = 0.009). In the laboratory data, median white blood cell count was lower in HPeV3-infected patients than those in EVs-infected patients (5,200/µL vs. 8,900/µL, P < 0.001). The pleocytosis was observed 58% of EVs-infected patients, but none of the HPeV3-infected patients (P < 0.001); however, HPeV3 RNA was frequently detected than EVs in CSF (90% vs 66%, P = 0.012).

**Conclusion.** This study showed that HPeV3-infected neonates and young infants presented more severe clinical manifestations than those infected with EVs. Significant tachycardia, poor peripheral circulation, and fulfilling SIRS criteria at the presentation may be the clues considering HPeV3 infection rather than EVs infection.

**Disclosures.** All authors: No reported disclosures.

### 2333. An Assessment of the Validity of the Comprehensive Severity Index (CSI) as a Measure of Severity of Influenza Infection in Children

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**Background.** A standardized quantitative severity score that reflects the breadth of influenza-related complications would prove valuable in epidemiologic analyses. The maximum CSI score (maxCSI) is a composite, continuous measure of illness severity, based on the degree of abnormality of individual signs and symptoms of a patient’s disease or diseases. Importantly, the index contains criteria for influenza as well as related complications.

**Methods.** We evaluated the spectrum of influenza illness as measured by maxCSI and assessed its discriminatory power on 321 influenza-infected, otherwise healthy children (0–17 years) enrolled into a prospective study from the emergency department and inpatient units of a pediatric tertiary care hospital and an urban community pediatric clinic. The area under ROC curve (AUC) was computed for univariate (maxCSI as a sole predictor variable) and multivariable logistic regression models of two outcome measures: (1) influenza-related respiratory and extra-respiratory complications based on physician diagnosis and (2) hospitalization. Multivariable models incorporated maxCSI, age, household crowding, influenza subtype/antivirus therapy. For each outcome, the Hanley-McNeil method was used to compare AUCs of univariable and multivariable models.

**Results.** Of the 321 children enrolled, 200 (62.3%) were male and the median age was 5.25 years (range 0.07–17.96). 73 (22.7%) had complications while 61 (19.0%) were hospitalized. The median maxCSI was 25 (range 0–140). In univariate and multivariable modeling, maxCSI was significantly associated with both influenza-related complications and hospitalization (all P < 0.0001). The univariate models discriminated well between children with and without complications [AUC 0.88 (95% CI 0.83–0.93)] and between those who were and were not hospitalized [AUC 0.94 (95% CI 0.91–0.97)]. The AUCs for the corresponding multivariable models were not statistically significantly different: 0.90 (95% CI 0.86–0.94; P = 0.13) for complications and 0.94 (95% CI 0.91–0.97; P = 0.34) for hospitalization.

**Conclusion.** The maxCSI represents a valid continuous outcome measure that can be leveraged to increase statistical power in epidemiologic studies aimed at identifying factors associated with severe influenza.

**Disclosures.** All authors: No reported disclosures.

### 2334. Neurological Manifestations of Hospitalized Children with Influenza During the 2016–2017 Season

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Results. 122 subjects were enrolled up to a data cutoff of March 31, 2017 (<2 yrs, n = 7; 2–<7 yrs, n = 37; ≥7 yrs, n = 84; 13–17 yrs, n = 30). Interim results are reported for the first 108 subjects randomized, of which 101 (94%) received study drug. Influenza was confirmed by PCR in 75 (74%) subjects who received study drug (Intent-to-treat Infected [ITTI] population). Key endpoints are summarized:

| Variable                  | PVR | OSE |
|---------------------------|-----|-----|
| ITTI population: n (%)    | 59  | 16  |
| A/H1N1                    | 22 (37%) | 9 (56%) |
| A/H3N2                    | 12 (20%) | 3 (19%) |
| A/Ind                    | 1 (2%) | 0 (0%) |
| B                        | 23 (39%) | 4 (25%) |
| Proportion of ITTI population shedding virus, n (%)   | 0/3 (0%) | 0/3 (0%) |
| Baseline                  | 5/59 (90%) | 14/16 (88%) |
| Day 3                     | 2/27 (46%) | 10/16 (63%) |
| Day 7                     | 2/59 (3%) | 0/16 (0%) |
| Day 14                    | 0/59 (0%) | 0/16 (0%) |
| Time to alleviation of symptoms, hrs² | 75.6 (47.0, 109.2) | 99.8 (34.7, 133.6) |
| Time to resolution of fever, hrs² | 40.5 (22.1, 470) | 34.7 (13.7, 42.3) |

¹Determined by virus culture assay; ²ITTI population: median (95% CI).

No serious adverse events were reported. AE's occurring in more than two subjects overall were:

| Variable                  | PVR | OSE |
|---------------------------|-----|-----|
| Safety population: n      | 78  | 23  |
| Any event                | 17 (22%) | 5 (22%) |
| Vomiting                | 2 (3%) | 2 (9%) |
| Nausea                   | 0 (0%) | 0 (0%) |
| Pyrexia                  | 2 (3%) | 0 (0%) |
| Typanic membrane hypereosin | 0 (0%) | 0 (0%) |

Conclusion. Treatment of influenza in pediatric subjects with single dose IV PVR or 5 days of oral OSE was generally safe and well tolerated. Whilst not powered for efficacy differences, trends were observed in more rapid reduction in virus shedding and symptom alleviation for PVR treated subjects compared with OSE. The study continues to enroll subjects < 7 years.

Disclosures. J. Vanchiere, BioCryst Pharmaceuticals: Consultant and Investigator, Consulting fee and Research support; S. Plunkett, BioCryst Pharmaceuticals: Investigator, Research support; R. Annamalai, BioCryst Pharmaceuticals: Investigator, Research support; K. Julien, BioCryst Pharmaceuticals: Investigator, Research support; J. Peterson, BioCryst Pharmaceuticals: Investigator, Research support; M. Goisse, BioCryst Pharmaceuticals: Investigator, Research support; S. Christensen, BioCryst Pharmaceuticals: Investigator, Research support; P. Mehta, BioCryst Pharmaceuticals: Investigator, Research support; S. Coleman, BioCryst Pharmaceuticals: Investigator, Research support; F. Munoz, BioCryst Pharmaceuticals: Investigator, Research support; A. Flynt, BioCryst Pharmaceuticals: Consultant, Consulting fee; S. Dobo, BioCryst Pharmaceuticals: Employee, Salary; E. Nagy, BioCryst Pharmaceuticals: Employee, Salary; D. Kargl, BioCryst Pharmaceuticals: Consultant, Consulting fee; A. Mathis, BioCryst Pharmaceuticals: Employee, Salary; P. Collis, BioCryst Pharmaceuticals: Employee, Salary; W. Sheridan, BioCryst Pharmaceuticals: Employee, Salary

233. A Systems Analysis Approach to Define the Protective Host Immune Responses of Children with Mild Respiratory Syncytial Virus Infection

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Saturday, October 7, 2017: 12:30 PM

Background. The mechanisms that result in upper respiratory tract disease (URTD) in infected children who do not develop severe disease are not fully understood. Characterization of such response may have implications for vaccine development. We sought to define the transcriptomic and cellular immune profiles associated with mild RSV disease in children.

Methods. We enrolled 190 previously healthy children < 2 yrs of age: 125 with RSV infection treated as outpatients (OP; mild disease; n = 41) or inpatients (IP; severe disease; n = 84), and age-matched healthy controls (HC; n = 65). Nasopharyngeal RSV loads, blood RNA transcriptome and WBC immunophenotyping were analyzed according to disease severity.

Results. OP were older (7.6 m) than IP (2.6 m; P < 0.01). Median duration of symptoms at enrollment in both groups was 4 days, yet RSV loads were higher in OP...