Omicron versus Flu & RSV – Which is Most Dangerous for Children?

Take Home Point: In this study, hospitalization rates were higher for patients with RSV than Omicron (COVID-19) or influenza in all age groups of children.

Citation: Hedberg P, Abdel-Halem L, Valik J, et. al. Outcomes of Pediatric SARS-CoV-2 Omicron Infection vs Influenza and Respiratory Syncytial Virus Infections. *JAMA Pediatr.* 2023 Dec 26: e235734. doi: 10.1001/jamapediatrics.2023.5734

Relevance: With increasing availability for respiratory pathogen testing, it is more common to be able to diagnose specific respiratory viruses from urgent care (UC). Better understanding of the outcome of each viral infection in children can improve UC clinicians advice to parents.

Study Summary: This was a multicenter cohort study using 5 population-based data sources including all 3 pediatric emergency departments (ED) in Stockholm, Sweden. The authors included patients under 18 years with a polymerase chain reaction (PCR) test positive for SARS-CoV-2 (Omicron strain), influenza A/B, or respiratory syncytial virus (RSV) from 1 day before to 1 day after an ED visit. Outcomes were hospitalization, intensive care unit (ICU) admission, and 30-day all-cause mortality.

The authors reviewed 2,596 patients with positive viral testing and found, 896 [34.5%] had Omicron, 426 [16.4%] had influenza A or B, and 1,274 [48.0%] had RSV infections, respectively. Hospitalization rates were 31.5% for Omicron, 27.7% for either influenza strain, and 81.7% for RSV. For infants aged up to 1 year, odds ratios (ORs) for hospitalization were 11.29 (95%CI, 8.91-14.38) for RSV vs Omicron, and 1.67 (95% CI, 1.03- 2.68) for influenza vs Omicron. ICU admissions rates were ‹1% in the Omicron and influenza group and 2.9% in the RSV group. There were 3 deaths within 30 days of ED visit among all patients.

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Editor's Comments: The retrospective nature and design of the study only detected patients ill enough to present to the ED. Patients with mild symptoms likely did not present for care or presented to environments other than the ED. Vaccination status of children was not documented and the majority of the children were under 2 years of age. Regardless, based on the sample size and strength of findings, counseling parents to maintain greater vigilance among infants with RSV seems prudent. ■

Is Your Child Really Allergic to Penicillin?

Take Home Point: In this study, direct oral challenge with amoxicillin resulted in de-labelling of 98% of penicillin allergy in low-risk patients.

Citation: Vyles D, Hoganson J, McAneney C, et. al. Multisite Oral Amoxicillin Challenges During Pediatric Emergency Department Visits. *JAMA Pediatr.* 2023 Dec 1;177(12):1348-1350. doi: 10.1001/jamapediatrics.2023.3659.

Relevance: With approximately 10% of patients reporting penicillin allergy, it is the most commonly reported medication intolerance. However, true penicillin allergy is rare and the penicillin class of antibiotics is effective for many bacterial infections in childhood, as well as inexpensive. Safely de-labelling allergies in low-risk patients has been shown to improve outcomes and decrease health care expenses as well.

Study Summary: This was a cohort study of children aged 2 to 16 years with a parent-reported penicillin allergy presenting to 3 urban Midwest teaching pediatric EDs within the Pediatric Emergency Care Applied Research Network. Patients who were identified as low risk, based on a 3-tiered risk assessment method were enrolled. Parents of these children were approached to participate in direct oral challenge (DOC) with amoxicillin during their ED course.

The authors enrolled 117 participants who completed the DOC. They managed to de-label 98% of the children from their reported penicillin allergy after the DOC. The authors found significant differences among the frequency of low-risk assessment prevalence across the three sites (57%, 69%, and 46%; P ‹ .001), family interest in the DOC (87%,75%, and 58%; P ‹ .02), and clinician willingness to

proceed with DOC (85%, 94%, and 56%; P < .001).

Editor's Comments: This study was based in pediatric EDs which are better resourced to deal with any significant issues resulting from DOCs and also able to observe patients for longer periods of time compared to UCCs. Nonetheless, this adds to the rapidly growing body of literature highlighting the frequency with which reported penicillin allergies are spurious and how bedside tools rather than allergy testing can offer a viable strategy for safely de-labeling appropriately low risk patients at the point-of-care. ■

Buzzy, ShotBlocker, or DistrACTION Cards – Which Works Best?

Take Home Point: In this study, Buzzy, DistrACTION Cards, and the ShotBlocker device were more effective for reducing pain and anxiety associated with venipuncture in children compared to a control group.

Citation: Sivri B, Balci S, Dolgun D The Effect of 3 Methods (Buzzy, ShotBlocker, and DistrACTION Cards) Used While Taking Blood Samples From Children with Pain and Anxiety - A Randomized Controlled Trial. *Pediatr Emerg Care*. 2023 Aug 1;39(8):600-607. doi: 10.1097/PEC.0000000000002866

Relevance: Invasive procedures such as blood draws can be distressing to children and lead to subsequent fear and anxiety surrounding healthcare settings. In recent years, a growing number of devices have been developed to alleviate procedural discomfort for pediatric patients.

Study Summary: This was a prospective RCT comparing 3 non-pharmacological techniques, Buzzy, ShotBlocker, and DistrACTION Cards to reduce pain experienced by children while undergoing venipuncture in an ED setting in Turkey. Buzzy is believed to temporarily alter pain signals by skin stimulation with the effect of cold and vibration. ShotBlocker attempts to alter pain signals by applying pressure to the skin with protrusions on its surface. DistrACTION Cards attempt to decrease pain by drawing the child's attention to pictures on cards. State-Trait Anxiety Inventory for Children (STAIC) was used to determine the anxiety of the children, and the visual analog scale (VAS) and Faces Pain Scale – Revised (FPS-R) to evaluate the pain. Participants were randomized in a 1:1:1:1 fashion by computerized generated randomization to either receive one of the interventions or none (control).

The authors enrolled 242 patients with 61 control, 61 ShotBlocker, 60 Buzzy and 60 DistrACTION groups respectively. They found postprocedural STAIC scores of the control group were significantly higher than those of the children in each intervention group (p = 0.020, P = 0.012, and P = 0.002, respectively). There was no significant difference between the groups receiving each of the interventions based on the postprocedural STAIC scores.

For the VAS pain scores, children in the Buzzy, DistrACTION Cards and ShotBlocker groups were all lower than pain scores in the control group. Between the 3 intervention groups, Buzzy and DistrACTION cards children experience lesser pain compared to ShotBlocker group.

Editor's Comments: There may be limitations in generalizability due to the nature of this as a single center ED in Turkey. This study looked at venipuncture alone, which is infrequently performed on in children at most UC centers. It is also unclear to what extent these interventions may reduce pain and anxiety associated with other procedures in children. Other techniques such as bubble therapy were not investigated, however, these results suggest that low-tech, non-pharmacological techniques can facilitate painful procedures in pediatric patients. ■

Is Flu Season Now a Thing of the Past?

Take Home Point: Changes in non-pharmacological interventions implemented to control COIVD-19 have altered the pattern of seasonality for other respiratory viruses. It is unclear to what extent seasonal variations in other respiratory virus infection rates may be permanently altered.

Citation: Varela-Lasheras I, Perfeito L, Mesquita S, et. al. The effects of weather and mobility on respiratory viruses dynamics before and during the COVID-19 pandemic in the USA and Canada. *PLOS Digit Health*. 2023 Dec 21;2(12): e0000405. doi: 10.1371/journal.pdig.0000405

Relevance: Understanding the contribution of different factors to the dynamics of respiratory viruses is more relevant with climate change, newly emerging viruses, and changes in human behaviors. This may impact future recommendation on timing of vaccinations and decisions about when testing for influenza or other viruses may or may not be indicated.

Study Summary: This was an epidemiological and surveillance data study encompassing data collected nation-wide from the US and Canada. Epidemiological data from the National Respiratory and Enteric Virus Surveillance System (NREVSS, Centers for Disease Control and Prevention), weather data from the Iowa Environmental Mesonet, and mobility data from the Bureau of Transportation Statistics (US Department of Transportation) and Google's COVID-19 Community Mobility Reports were analyzed. The analysis was performed by clustering analysis (to identify groups of viruses that have more similar temporal dynamics) and correlation analysis (exploring the similarities between the temporal dynamics of the viruses, with weather variables). Regression models were used to investigate the associations between the incidence of the different respiratory viral infections, weather conditions, and mobility.

The authors found that different respiratory viruses co-occur during the winter influenza season, but their incidence and dynamics were variable. Seasonal patterns diverged and became less consistent after the WHO COVID-19 pandemic declaration. Human patterns of travel and mobility have seemed to play a greater role in shaping the dynamics of respiratory virus surges since COVID-19 rather than patterns of changes in weather.

Editor's Comments: This was a robust epidemiological study looking at respiratory viral trends within both the US and Canada. The authors highlight the changing landscape of infections post pandemic. The results highlight the influence of human behaviors on trends in viral infections. As UC clinicians, it's worth noting that respiratory illness presentations may become closer to a year round phenomenon. It is important, however, to take the findings with a grain of salt as the data is limited to just several annual cycles since the COVID-19 pandemic. ■

Nirsevimab Use in Infants with RSV

Take Home Point: Nirsevimab therapy reduced the risk of hospitalization and severe disease among infants with respiratory syncytial virus (RSV) associated lower respiratory tract infection.

Citation: Drysdale S, Cathie K, Flamein F, et. al. Nirsevimab for Prevention of Hospitalizations Due to RSV in Infants. *N Engl J Med.* 2023; 389:2425-35. DOI: 10.1056/NEJMoa2309189

Relevance: Nirsevimab is a monoclonal antibody that has recently been approved for use for prophylaxis against RSV-related lower respiratory tract infections (LRTI) in children in the UK, Europe and the US. This study looks at its efficacy in a real-world environment.

"Human patterns of travel and mobility have seemed to play a greater role in shaping the dynamics of respiratory virus surges."

Study Summary: This study presents the results from the HARMONIE trial which recruited participants from 235 sites in France, Germany, and the United Kingdom. Eligible infants were randomly assigned in a 1:1 fashion to receive a single intramuscular (IM) injection of nirsevimab (50 mg for infants weighing <5 kg or 100 mg for those weighing ≥5 kg) or standard care (no intervention). The primary end point was hospitalization for RSV-associated LRTI.

The 8,058 infants (<12 months of age) were randomized to receive either nirsevimab (4,037 infants) or standard care (4,021 infants). The 99.6% of infants who received an IM dose of nirsevimab received it during the RSV season. The authors found that hospitalization for RSV-associated LRTI occurred in 11 infants (0.3%) in the nirsevimab group (1 event per 1000 person-months) and in 60 (1.5%) who received standard care (6 events per 1000 person-months), corresponding to an efficacy of 83.2% (95% confidence interval [CI], 67.8 to 92.0; P<0.001) for nirsevimab during the 2022–2023 RSV season. Analyses of subgroups defined according to age group (≤3 months, 3-6 months, or >6 months), weight, gestational age, sex, and the timing of randomization (before or during the RSV season) showed similar efficacy rates. The efficacy of nirsevimab was also consistent across the three participating countries.

Editor's Comments: The study had a short period of follow-up, 3 months, and was funded by pharmaceutical manufacturers. There was no blinding of the parents of the infants and its uncertain if this affected their subsequent behavior in seeking medical attention. Given the low reported risk of serious adverse events, this trial's data support the apropriateness of nirsevimab for preventing serious RSV illness in infants. Future studies should further define the practicality of this therapy and whether it is cost-effective. ■

Moderate-Vigorous Physical Activity to Overcome the Effects of Sedentary Time

Take Home Point: Small amounts of moderate-vigorous physical activity (MVPA) appears to be an effective strategy to ameliorate the increased mortality risk associated with a highly sedentary lifestyle.

Citation: Sagelv E, Hopstock L, Moreseth B, et. al. Device-measured physical activity, sedentary time, and risk of all-cause mortality: an individual participant data analysis of four prospective cohort studies. *Br J Sports Med*. 2023; 57:1457–1463.

Relevance: As UC clinicians, we spend a lot of sedentary time at work. This prospective cohort study examined how physical activity may mitigate harms of excessive sitting.

Study Summary: This was a pooled participant data from 4 prospective cohorts with device-measured physical activity placed at the hip of participants to examine whether the association between sedentary time and mortality was modified by physical activity. Participant data of prospective cohorts from Norway, Sweden, and the USA were pooled. All cohorts used ActiGraph accelerometers (ActiGraph, Pensacola, Florida, USA). Total physical activity was defined as step counts per minute divided by wear time, with volume of intensity-specific physical activity defined as: sedentary <100 counts per minute, light physical activity 100–2,019 counts per minute, and MVPA ≥2,020 counts per minute.

The authors analyzed data from 11,989 participants who were 50 years or older over 13 years. There were 805 deaths during the study follow-up period (6.7%). They found higher levels of MVPA were associated with lower mortality risk irrespective of the amounts of sedentary time. Higher sedentary time was associated with mortality in participants with low levels of MVPA. Accumulating at least 22 minutes per day of MVPA eliminated the association between sedentary time and mortality.

Editor's Comments: Participants in this study were older adults (>50 years). Many non-physical activity lifestyle factors, such as sleep and diet, were not accounted for, but could be significant confounders. Regardless, the strength of the associations reinforces the notion that movement is important for good health and adds further data in support of more intense movement, especially for those with particularly sedentary lifestyles. ■