H3N2 virus (median: 75.4 hours) was significantly shorter than in PLC (100.4 hours; P =0.0141) and was significantly shorter in patients with influenza B (74.6 hours) than in either PLC (100.6 hours; $P = 0.0138$) or Os (101.6 hours; $P = 0.0251$). Median time to cessation of viral shedding in BXM patients was 48 hours, significantly less than 96 hours in both PLC and Os patients. Systemic antibiotic use and influenza-related complications were significantly fewer in BXM (3.4% and 2.8%, resp.) than PLC (7.5% and 10.4%; $P = 0.0112$, and $P < 0.0001$). The incidence of any (25.1–29.7%) or serious adverse events (0.7–1.2%) did not differ significantly across the groups.

Conclusion. BXM was well-tolerated and associated with faster recovery and reduced risk of complications in HR influenza patients compared with PLC. It proved superior to Os in shortening the duration of virus replication and in resolving influenza B illness. Oral BXM is a promising treatment option for patients with risk factors for influenza complications.

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LB17. Age-Related Differences in Influenza Type/Subtype Among Patients Hospitalized with Influenza, FluSurv-NET—2017–2018

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Background. The 2017–2018 influenza season had the highest rates of influenza hospitalizations since the 2009 H1N1 pandemic. We used data from the Influenza Hospitalization Surveillance Network (FluSurv-NET) to identify unique characteristics of the 2017–2018 season.

Methods. We included all patients residing within a FluSurv-NET catchment area, and hospitalized with laboratory-confirmed influenza during 2017–2018. We used multiple imputation, including age, surveillance site, and month of hospital admission as predictors, to impute influenza A subtype for 40–64% of cases across seasons with an unknown subtype. We calculated influenza hospitalization rates by type/subtype per 100,000 population. We compared 2017–2018 rates to rates during 4 prior seasons: 2016–2017, 2015–2016, 2014–2015, and 2013–2014.

Results. The overall unadjusted hospitalization rates per 100,000 population varied from 31.5 during 2015–2016 to 105.1 during 2017–2018. After imputing A subtype, the 2017–2018 season had the highest rates observed for H3N2 (62.8) and B (28.5) than in any previous season, and the third highest rate of H1N1 (13.5) (Figure 1A). During 2017–2018, rates in adult ≥65 years peaked 3 weeks before they peaked in children 0–4 years. In contrast, during the four prior seasons, rates in adults ≥65 years peaked during the same week or 1 week after they peaked in children 0–4 years. During 2017–2018, the distribution of influenza type/subtypes varied significantly by age group ($P < 0.0001$); for example, the proportion of cases with H1N1 ranged from 19 to 29% in those <65 years to only 7% in those ≥65 years. During 2017–2018, H1N1 (the nonpredominant A virus) contributed >25% of A cases across all age groups (except ≥65 years) vs. all prior seasons where the nonpredominant A virus contributed <10% of A cases across all age groups (except ≥65 years) (Figure 1B–F).

Conclusions. Several unique characteristics may have contributed to the high hospitalization rates observed during 2017–2018. Rates in older adults, who were predominantly infected with H3N2, peaked several weeks prior to children in contrast to prior seasons. Higher overall rates of H3N2 and B were observed in 2017–2018 compared with these prior seasons and substantial H1N1 co-circulation also occurred with marked variability by age group.

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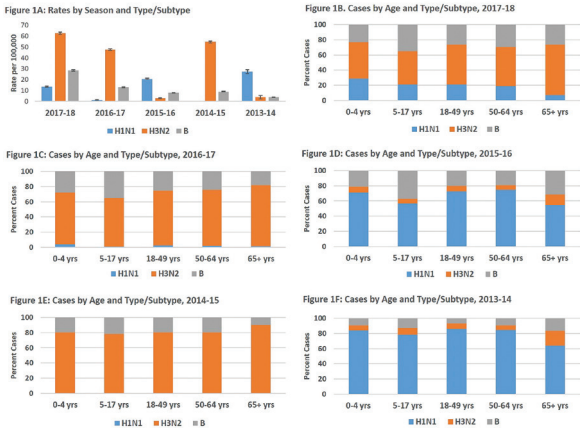
Figure. Hospitalization Rates and Distribution of Influenza Type/Subtype by Season and Age Group, FluSurv-NET, 2013–14 to 2017–18



LB18. An Enveloped Virus-like Particle (eVLP) Cytomegalovirus (CMV) Vaccine Is Immunogenic and Safe: Results of a First-in-Humans Study

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Background. CMV is the most common cause of congenital infection and may result in permanent neurodevelopmental injury including vision and hearing loss. A vaccine to prevent transmission of CMV during pregnancy or to immunocompromised persons is a public health priority. Neutralizing antibodies (nAb) to the CMV envelope glycoprotein B (gB) in natural infection are thought to confer protection, but some vaccine candidates based on this protein alone have been insufficiently immunogenic. In this FiH dose-ranging, controlled, observer-blinded study the safety and immunogenicity of an eVLP expressing the ectodomain of gB fused to transmembrane and cytoplasmic domains of the vesicular stomatitis virus G protein (gB-G) was evaluated.

Method. Healthy CMV-seronegative 18–40 year olds at three sites in Canada (Vancouver, Montreal, Halifax) were randomized to one of four dose formulations (0.5 µg, 1 µg, or 2 µg gB content with Alum) or 1 µg gB without Alum, or placebo given on days 0, 56, and 168. Outcome measures were solicited and unsolicited adverse events (AE), severe AE, gB binding antibody titers and avidity assessment, and nAb to CMV infection of fibroblast and epithelial cells. A Data Safety Monitoring Board was in place.

Result. Among 128 participants, the most common solicited local and general AEs were pain and headache, respectively. No SAEs or withdrawals occurred. A dose-dependent boosting of nAb titers was observed after doses 2 and 3, with the highest titers in the Alum-adjuvanted 2.0 µg dose recipients. Fibroblast cell nAb were seen in 100% of 2.0 µg dose recipients, and epithelial cell nAb in 31%. Epithelial cell nAb was correlated with higher geometric mean gB binding titers, and there was a correlation between fibroblast and epithelial cell nAb titers.

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Conclusion. An eVLP CMV vaccine was immunogenic at very low doses in healthy seronegative adults and no safety signals were seen. Alum adjuvantation increased immunogenicity as did higher antigen content and multiple doses. This phase 1 trial supports further development of this eVLP CMV vaccine candidate.

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LB19. Progress Toward a Vaccine for Maternal Immunization to Prevent Respiratory Syncytial Virus (RSV) Lower Respiratory Tract Illness (LRTI) in Infants

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Background. RSV is the leading cause of infant LRTI and hospitalization worldwide. The greatest burden of severe disease is in term infants <5 months old. Novavax