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**Session:** 251. Adolescent Vaccines
**Saturday, October 6, 2018: 12:30 PM**

**Background.** The quadrivalent meningococcal conjugate vaccine (MenACYW-TT) is recommended for use in adolescents since 2005. Soon after, case reports of Guillain-Barre syndrome (GBS) following vaccination prompted subsequent studies, with a meta-analysis concluding that the attributable risk of GBS after MenACYW-D is unlikely to exceed 1 case per million vaccinations. We conducted a retrospective cohort study in the Vaccine Safety Datalink to assess the risk of 10 outcomes, including GBS, following MenACYW-D.

**Methods.** We included adolescents (aged 11–18 years) vaccinated with MenACYD-D during the years 2005–2014. We identified pre-specified outcomes using ICD-9 (International Classification of Disease, version 9) codes. We used automated data only for fever, seizure, and syncope, and we verified confirmed cases by medical record review for acute disseminated encephalomyelitis (ADEM), acute transverse myelitis (ATM), anaphylaxis, chronic inflammatory demyelinating polyneuropathy (CIDP), GBS and Henshock-Schönlein purpura (HSP). We used a self-controlled case-time design to estimate relative risk (RR).

**Results.** Following 1.4 million doses of MenACYW-D, we detected increased risks for fever in the 1–6 days following vaccination (RR 1.5, 95% confidence interval [CI] 1.3–1.7) and syncope on the day of vaccination (RR 5.8, 95% CI 4.1–8.3), but not for seizures (RR 1.1, 95% CI 0.7–1.9) or Bell’s palsy (RR 1.1, 95% CI 0.8–1.5). We detected no cases in the post-vaccination risk intervals for CIDP, ADEM or ATM. We detected few cases of the other outcomes resulting in relatively unstable RR estimates: anaphylaxis (RR 1.9, 95% CI 0.5–7.1), GBS (RR 2.5, 95% CI 0.6–10.0) and HSP (RR 1.6, 95% CI 0.7–3.3). We estimated that the attributable risk of GBS was 1.5 cases per million vaccinations (upper bound of one-sided 95% CI, 4.9).

**Conclusion.** In a large retrospective cohort, we detected increased risks for syncope and fever, but not seizures or Bell’s palsy, following vaccination with MenACYW-D. Our estimates were rare. Our findings, consistent with previous studies, suggest that the increased risk of GBS, if any, is likely small (<5 excess cases of GBS per million vaccinations).

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**2462. Immunogenicity and Safety of a Quadrivalent Meningococcal Conjugate Vaccine (MenACYW-TT) Administered in Individuals 56 Years of Age and Older Robert W.4; swept,4 Mandep S.4; Dharap,4 Mandeep S.4; Dhingra,4 MD, MPH5; Chad N.5; Reves5; 1Sanofi Pasteur, Swiftwater, Pennsylvania, 2Sanofi Pasteur, Pfizer, Sanofi, and Saad Omer; 3MBBS, MPH, PhD, FIDSA; 4MD, MPH; 5MD, MPH, FIDSA; 6Kaiser Permanente Colorado, Denver, Colorado, 7Kaiser Permanente Health Research Institute, Seattle, Washington, 8Global Health, Rollins School of Public Health, Emory University, Atlanta, Georgia

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**Background.** The MenACYW-TT conjugate vaccine is a quadrivalent meningococcal polysaccharide vaccine (MPSV4) in adults ≥56 years of age. A randomized, modified double-blind, multicenter study (NCT02842866) was conducted in 907 healthy adults in the United States. Participants were randomized to receive a single dose of either MenACYW-TT conjugate vaccine or MPSV4, stratified according to age into 2 subsets: 36 to 64 and 65 years and older. Descriptive analysis was also performed for age subgroup sex and race/ethnicity. Serum were measured antibody against serogroups A, C, Y, and W test strains at baseline and 30 days after vaccination. Safety data were collected up to six months post-vaccination.

**Results.** Non-inferiority of immune responses was demonstrated between recommendations in Los Angeles County.

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**2464. A Significant Portion of College Students Are Not Aware of HPV Disease and HPV Vaccine Recommendations**

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**Session:** 251. Adolescent Vaccines
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**Background.** Although HPV vaccination has been shown to be very effective in preventing genital warts and cancers caused by the vaccine strains, immunization rates are low, especially among ethnic groups and certain ethnic groups. ACIP has recommended that the HPV vaccine be administered to females through age 26 and males through age 21 (26 in MSM). Therefore, there is a significant amount of time for catch up. We assessed college students’ awareness of HPV disease and ACIP HPV vaccine recommendations in Los Angeles County.

**Methods.** A 31-question survey was developed and IRB approved (WIRB No 1920852-43973015). CSULB Health Sciences students were trained on HPV disease and prevention, and they administered the survey in-person to other students at various locations on campus and recorded the data.

**Results.** One hundred eighty individuals were surveyed from February to April 2018. The average age of the respondents was 21 ± 2 years. The majority (110 out of 180; 61.1%) of the respondents were female. 75 out of 180 (41.7%) respondents were Latino/Hispanic, 62 out of 180 (34.4%) were Caucasian, 30 out of 180 (16.7%) were Asian
American and 20 out of 180 (11.1%) were AA. 91 out of 180 (50.6%) indicated that the highest level of education in their immediate family was some college credit, no degree. 91 out of 179 (50.8%) respondents had had ≥2 sexual partners, and 134 out of 180 (74.4%) used condoms. 25 out of 179 (14.0%) had not been sexually active. 3 out of 180 (1.7%) had experienced genital warts and 9 out of 131 (6.9%) had been diagnosed with cervical cancer. 36 out of 180 (20.0%) indicated that they had “no knowledge” of HPV, 95 out of 180 (52.8%) received the HPV vaccine, 44 out of 180 (24.4%) had not and 41 out of 180 (22.8%) did not know. 106 out of 180 (58.9%) participants did not know that the HPV vaccine is recommended for women and men through age 26, and 89 out of 180 (48.4%) did not know that they can get the HPV vaccine at the college student health center or youth friendly clinics.

Conclusion. A considerable proportion of college students are unaware of HPV disease, the age recommendations for the vaccine, who should receive the vaccine and where they can receive it. Educational programs targeting college students may be effective to close the HPV vaccine gaps.

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2465. A Pilot Program to Improve Human Papillomavirus Vaccination Status of Adolescents at a School-Based Health Center

Caitlin Hansen, MD; Anna North, MPH; Alison Moriarty-Daley, PhD, APN

Background. Papillomavirus (HPV) vaccine uptake is suboptimal in the United States. School-based health centers (SBHCs) could improve rates of vaccine uptake by making HPV vaccination available in schools and more accessible and convenient to adolescents and families. To explore the potential of SBHCs to expand HPV vaccine uptake, we sought to determine whether a pilot program to actively promote the SBHC as a venue for HPV vaccine receipt could improve HPV vaccination status.

Methods. A pilot program aimed at increasing HPV vaccine uptake was implemented at a SBHC affiliated with a hospital-based primary care center (PCC) between October 2016 and June 2017. This SBHC is located in a high school and provides vaccination services, including HPV vaccine, but no systematic protocol existed to actively identify and target for vaccination, patients who accessed clinical services at the PCC and were also enrolled in the SBHC. Immunization status of adolescents enrolled in the SBHC who were also patients of the PCC was screened by review of the common electronic health record (EHR) that is shared between both sites. Patients were eligible for inclusion if they were in need of a first dose of HPV vaccine. Eligible patients were contacted by clinic staff and offered the opportunity to receive HPV vaccine at the SBHC in accordance with usual clinic practices.

Results. Of 86 patients screened, 13 were found to be eligible for HPV vaccination at the SBHC (Figure 1). By the end of the project period, 62% of those eligible had received 2 doses of HPV vaccine (n = 8) and 38% (n = 5) also received another vaccine (flu, meningococcal) at the same time as HPV vaccination.

Conclusion. A pilot program consisting of determining HPV immunization status and actively offering the opportunity to receive needed doses of HPV vaccine at a SBHC resulted in improvement of vaccination status among eligible patients. Success was limited by the relatively small number of patients identified. While SBHCs may be one strategy to address missed opportunities for HPV vaccination, lack of centralized immunization records among patients who receive care from multiple providers and processes to directly communicate with parents about vaccination during school hours were identified as primary challenges.

Figure 1. Flow diagram of HPV vaccination pilot program at SBHC.

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2466. Evaluation of Immunization on the Neonatal Intensive Care Unit at British Columbia Women’s Hospital

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Session: 252. Vaccine Policy and Hesitancy Saturday, October 6, 2018: 12:30 PM

Background. Term and preterm infants in the neonatal intensive care unit (NICU) should be immunized at the same chronological age and on the same schedule as healthy term infants, but are often under-immunized. Reasons for under-immunization in this population have not been well-defined. The aim of this study was to assess the immunization rates of hospitalized term and preterm infants in the NICU and examine reasons for under-immunization.

Methods. Pharmacy and NICU databases were utilized to determine the immunization rates of eligible babies admitted to the NICU between 2011 and 2015. A retrospective review of unimmunized infants was undertaken to identify barriers to timely immunization. Patient demographics and transfers to other hospitals were recorded. Reasons for the delay in immunization were evaluated by detailed review of the hospital medical record.

Results. Of the 3,261 babies admitted to the NICU during the study period, 534 (16%) were hospitalized at 28 weeks of age, when first immunizations are adminis- tered. Of these, 142 (27%) received no immunizations in hospital. Sixty-five medical records were reviewed in detail. Thirty of the 65 (46%) medical records did not document that immunizations were due. In 21 (32%) of the 65 cases, there was no clear reason for lack of immunization. Of the remaining cases, infants were not vaccinated for a total of six reasons. Infants from the NICU were preferentially unwell, including surgery, sepsis/encephalopathy, severe immunocompromise, or palliative care, was one of the reasons for lack of vaccination in 35 (54%) of the 65 cases, parental refusal of vaccinations in 8 (12%) of cases, and deferral to discharging hospital in 7 (11%) of cases.

Conclusion. Significant comorbidity appeared to be the major reason behind vaccination delays, with 27% of highly vulnerable infants unimmunized. Significant improvements are required to ensure these babies receive vaccines upon recovery from their illness, and to ensure absence of immunization is clearly documented upon hospital discharge.

Disclosures. All authors: No reported disclosures.

2467. Timeliness of Childhood Vaccination With the Combination Measles–Mumps–Rubella Varicella Vaccine vs. the Separate Measles–Mumps–Rubella and Varicella Vaccines in the United States

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Session: 252. Vaccine Policy and Hesitancy Saturday, October 6, 2018: 12:30 PM

Background. A combination measles mumps rubella varicella (MMRV) vaccine was first licensed for use in the United States in 2006. The ACIP has recommended that all children receive 2 doses of measles mumps rubella (MMR) and varicella (V) vaccines on the same schedule, with the first dose at 12–15 months and second dose at 4–6 years. In 2014, the combination MMRV vaccine was recommended for use for each dose. Post-licensure studies suggested a small increased rate of febrile seizure when MMRV is used as the first dose vs. MMR+V. In 2009, the ACIP revised its guidance to recommend separate injections of MMR+V for the first dose unless the parent or caregiver expressed a preference for MMRV. The objective of this study was to evaluate patterns of coverage and product utilization between 2006 and 2016.

Methods. This was a retrospective study of health insurance claims data in the MarketScan® Commercial Claims and Encounters Database from 2006 to 2016. Two cohorts were defined: children eligible for vaccination with continuous enrollment dur- ing ages 12–23 months (first dose cohort), and/or 4–7 years (second dose cohort). The primary outcome measures were vaccine coverage for first (by 19 months) and second (by 7 years) doses, percent with delays in vaccination, and length of vaccine delay.

Results. The analysis included 850,779 and 1,403,139 children in the 1st and 2nd dose cohorts, respectively. Of the children in each dose cohort (1st/second), 7%/14% received MMRV vaccines, 77%/62% received MMR and/or V, and 1%/24% had no records of receiving any of the vaccines by the milestone age. Of those receiving MMR and/or V vaccines, 9%/21% were missing one of the two vaccines, 70%/65% had both on the same day, and 21%/14% received them on different days with median delays of 3 months/1 year (first/second dose, respectively).

Conclusion. MMRV vaccine is used infrequently as a first dose in this commercially insured population. Despite the ACIP recommendation to use MMRV for second dose, this vaccine is underutilized; use of MMR and V instead may result in delayed vaccination. Increased use of MMRV vaccines for the second dose between 4 and 6 years of age has the potential to improve vaccine compliance and coverage, and reduce the number of physician office visits.

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