Session: 279. Vaccines: Viral Non Influenza
Saturday, October 5, 2019: 12:15 PM

Background: Varicella (VAR) and measles-mumps-rubella (MMR) vaccines are recommended for children at ages 12–15 months and 4–6 years. These are administered as separate MMR and VAR vaccines according to routine recommendations. All HZ cases ≥ 21 days after first varicella vaccination were identified using ICD-9 codes from inpatient, outpatient, emergency room encounters, and claims data, through 2014. HZ incidence after vaccine doses or after the first dose in children with only one dose; 21.8 cases/100,000 person-years), than in the period before the second dose (i.e., between first and second doses or after the first dose in children with only one dose; 21.8 cases/100,000 person-years, P < 0.0001). HZ incidence was also lower after two varicella vaccine doses in each of the three first-dose formulation groups.

Conclusion: HZ incidence among children varied by first-dose varicella vaccine formulation and number of varicella vaccine doses. Regardless of the first-dose varicella vaccine formulation, children who received two vaccine doses had lower HZ incidence after the second dose.

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2769. The Clinical and Economic Impact of MMR Vaccinations to Prevent Measles Importations from US Pediatric Travelers
Saturday, October 5, 2019: 12:15 PM

Background: Although pediatric travelers comprise <10% of US international travelers, they account for almost half of all measles importations among returning travelers. For travelers 1–18 years with no other evidence of measles immunity, the Advisory Committee on Immunization Practices (ACIP) recommends routine recommendations. All US travelers (6 months to <6 years) are at risk for being underimmunized for measles because MMR is routinely given at 1 and 4 years.

Methods: We developed a decision tree model to evaluate the clinical impact and cost per case averted of pretravel health encounters (PHE) that vaccine MMR-eligible pediatric international travelers. We compared 2 strategies for infant (6 < 12 months) and preschool-aged (1 to <6 years) travelers: (1) no PHE: travelers departed with baseline MMR vaccination status vs. (2) PHE: MMR-eligible travelers were offered vaccination. All simulated travelers experienced a destination-specific risk of measles exposure during travel (mean, 237exposures/10M travelers; range, 1.9–49,300exposures/10M travelers). If exposed to measles, travelers were at increased risk of illness stratified by age and MMR vaccination status (range, 0.03–0.90).

Results: Compared with no PHE, PHE averted 451 measles cases at $985,000/case averted for infant travelers and 54 measles cases at $1.5 million/case averted for preschool-aged travelers (table, bottom). PHE can be cost-saving for travelers to regions with higher risk of measles exposure and if more MMR-eligible travelers are vaccinated at PHE (Figure 1). At a risk of exposure associated with European travel, PHE had better value when a measles importation led to a higher number of contacts or more US-acquired cases per importation (Figure 2).

Conclusion: PHE for pediatric travelers (6 months to <6 years) decreased the number of imported measles cases and saved costs, especially if targeted to travelers with higher-risk destinations, if more MMR-eligible travelers are vaccinated at PHE, or if outbreaks are larger.

Table: Input parameters and base case results in a model of clinical and economic impact of MMR vaccinations to prevent measles importations from US pediatric travelers.

Table:

| Model Input Parameters | Infant (age 6–12m) | Preschool-aged (age 1–5y) | Reference |
|------------------------|-------------------|---------------------------|-----------|
| Number of past MMR vaccinations | 92% | 92% | [1] |
| % of cohort with past MMR vaccination | 9% | 8% |
| Risk of measles infection, if exposed | 90% | 90% | [2,3,4] |
| US-acquired cases per importation | 0.0001 | 0.0001 | [0.0001] |
| Vaccine protection | 44% | 56% | [7] |
| Cost per vaccination | $90 | N/A* |
| Cost per PHE | $7 | [9] |
| Cost per measles importation | $15,200 | [8] |
| Cost per US-acquired case | $4,800 | [8] |
| Cost per contact | $550 | [7,8] |

Model Results

Measles importations/10M travelers
No PHE | 199 | 19 | [7] |
US-acquired cases/importation | 4 | 4 | [0.0004] |
Pneumococcal (282 [2.5%]), and herpes zoster (246 [2.1%]) vaccines. Review of data from selected temporal spikes in posts demonstrated that they were usually attributable to increased reposts of an original post or to personal views, rather than containing incremental factual new safety data.

Conclusion: Fewer than 1% of posts from relevant social media sources contained sufficient information to be considered valid cases. No new safety signals were identified for any of the vaccines from social media cases (valid or non-valid). Among posts containing safety information, the nature of this information tends to be redundant or sentimental, precluding meaningful safety analyses.

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2768. Does Social Media Contribute to Knowledge About Vaccine Safety?
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Session: 279. Vaccines: Viral Non Influenza
Saturday, October 5, 2019: 12:15 PM

Background: Social media is frequently used to share medical information. Current European regulatory guidance for the pharmaceutical industry calls for reporting valid adverse events (AE) derived from social media as well as consideration of non-valid AEs. This guidance is followed when our company utilizes social media related to any company products and interests. Here we evaluate its application to vaccines.

Methods: Posts collected from all screened social media sources (company owned, or company reviewed) were examined (August 1, 2017–February 28, 2019) to identify safety-related information pertaining to any of its 14 licensed vaccines. Posts were analyzed as part of routine safety surveillance.

Results: Among 69,682 vaccine-related posts reviewed, 285 (0.4%) were valid; 1,464 (64.5%) were non-valid; 47,966 (83.1%) were not relevant. Most non-valid cases concerned the company’s 4-vaccine (9,834 [78%]) or 9-vaccine (1,420 [12%]) human papillomavirus vaccines, followed by its measles-mumps-rubella (336 [2.9%]), pneumococcal (282 [2.5%]), and herpes zoster (246 [2.1%]) vaccines. Review of data from selected temporal spikes in posts demonstrated that they were usually attributable to increased reposts of an original post or to personal views, rather than containing incremental factual new safety data.

Conclusion: Fewer than 1% of posts from relevant social media sources contained sufficient information to be considered valid cases. No new safety signals were identified for any of the vaccines from social media cases (valid or non-valid). Among posts containing safety information, the nature of this information tends to be redundant or sentimental, precluding meaningful safety analyses.

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2770. Intrapulmonary Vaccination with an M Protein-Deficient Respiratory Syncytial Virus (RSV) Vaccine Protects Infant Baboons Against an RSV Challenge

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Session: 279. Vaccines: Viral Non Influenza
Saturday, October 5, 2019: 12:15 PM

Background: RSV infection is a major cause of lung disease in infants, yet there is no licensed vaccine. We are developing a live RSV vaccine with a deletion of the M protein marker ("Mnull RSV"). The RSV M protein is responsible for assembling newly synthesized RSV proteins into intact virus. Mnull RSV infects cells, replicates all proteins except M, and incites antibody and T-cell responses but, in the absence of the M protein, cannot replicate and infect other cells. We wished to show that vaccination with Mnull RSV directly into the lung in early infancy induces persistent neutralizing antibody (NA) responses that protect infant baboons against an RSV challenge.

Methods: Two-week-old infants were vaccinated with a single dose of Mnull RSV (8 × 10^7 vaccine units) or a sham preparation instilled into an endotracheal tube. Infants were observed continuously for signs of rapid breathing using infrared cameras. Four to six months later, sera RSV NA titers were determined, and infants were challenged intratracheally with the human RSV A2 strain. Respiratory rates were calculated daily. On days 0, 5, 7, and 12 after infection, arterial blood was drawn for blood gas analysis, lung function was assessed using a pneumotachometer, and bronchoalveolar lavage was performed for virus titrations.

Results: At 4–6 months following vaccination, RSV NA was present at a mean titer of 192 in sera of Mnull RSV recipients, but was undetectable in sera of sham vaccinated animals. Animals were then challenged with RSV, and sham vaccinated animals developed increased respiratory rates, increased alveolar-arterial (A-a) oxygen gradients, and BAL viral titers on day 5 were 3,500 pfu/mL. In contrast, Mnull RSV vaccinated animals had lower respiratory rates throughout the length of the study (P = 0.038), lesser A-a gradients (improved oxygenation) vs. controls, and no virus was recovered from BAL fluids (P < 0.001).

Conclusion: Intrapulmonary vaccination of infants with Mnull RSV at 2 weeks of age results in strong RSV NA responses that persist beyond the length of an average RSV season. Mnull RSV recipients were protected against tachypnea, reduced oxygenation, and viral replication for at least 4 months following vaccination. We will next study intrapulmonary vaccination administering Mnull RSV via a nebulizer.

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2771. Seroprotection against Measles, Rubella, Tetanus, and Diphtheria Among Children in Haiti—2017

Children in Haiti—2017

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Background: Measles, rubella, and maternal and neonatal tetanus have been verified to be eliminated in Haiti, but a diphtheria outbreak has been ongoing since 2014. To evaluate progress toward maintaining vaccine preventable disease (VPD) elimination and control, we conducted the first survey to estimate immunity to these VPDs among children in Haiti.

Methods: We conducted a nationally representative, two-stage cluster survey in 2017, stratifying Haiti into 2 regions: (1) West Region, the highly urban West department that includes one-third of Haiti’s population; (2) Non-West Region (all other departments). We sampled 4,286 households to recruit at least 910 children aged 5–7 years. We obtained vaccination history and dried blood spots from one eligible child per household. Antibody concentrations to VPDs were measured on a multiplex bead assay. We compared seroprotection and vaccination coverage estimates.

Results: Among 1146 enrolled children, tetanus (83%, 95% CI: 80%–86%) and diphtheria (83%, 95% CI: 81%–85%) seroprotection were higher than coverage with 3 doses of tetanus and diphtheria containing vaccine (DTP3) (68%, 95% CI: 61%–74%). No participants had antibody concentrations consistent with long-term immunity to tetanus or diphtheria. Measles (87%, 95% CI: 85%–89%) and rubella (84%, 95% CI: 81%–87%) coverage were higher than or similar to vaccination with at least 1 dose of measles-rubella (MR) vaccine (84%, 95% CI: 80%–87%) (Figure 1). MR second-dose coverage was 20% (95% CI: 16%–24%). Seroprotection in the West Region was lower than in the non-West Region for all VPDs.

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