Table 2: Number of observed, predicted counterfactual, and averted hepatitis A cases in the post- HepA vaccination period (2015-2018), according to age group.

Age groups	Observed	Predicted counterfactual	Averted cases	
			Median	Percentiles (2.5 -97.5%)
<12 months	88	404	316	288; 336
1-4 years old	423	2,375	1,952	1,855; 2,023
5-14 years old	1,925	10,427	8,502	8,062; 8,857
15-39 years old	3,495	6,302	2,807	2,488; 3,025
≥40 years old	1,255	1,575	320	262; 371
Total	7,186	21.654	14,468	13,395; 15,138

Conclusion. In Brazil, the single-dose hepatitis A vaccine childhood program effectively reduced the Hepatitis A incidence, HCRU and associated-costs in vaccinated and in some non-vaccinated age groups.

Disclosures. Ana Luiza Bierrenbach, MD, MSc, PhD, MSD Brazil (Grant/Research Support, Scientific Research Study Investigator, Research Grant or Support) Yoonyoung Choi, PhD, MS, RPh, Merck (Employee) Paula M. Batista, BSc, MSD Brazil (Employee) Fernando Serra, MD, MSD Brazil (Employee) Cintia Parellada, MD, PhD, MSD Brazil (Employee) Guilherme Julian, BSc, MSc, IQVIA (Employee) MSD (Consultant, Research Grant or Support) Karina Nakajima, BSc, PhD, IQVIA (Employee)MSD (Consultant, Research Grant or Support) Thais Moreira, MD, MSc, MSD Brazil (Employee)

1393. Factors Associated with Co-administration of Pentavalent DTaP-IPV/Hib and Monovalent Hepatitis B Vaccine in the United States (US)

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Session: P-63. Pediatric Vaccines

Background. The US vaccination schedule includes DTaP, IPV, Hib and HepB doses in the first 6 months of life. A previous analysis found variability in the timing of HepB doses in infants receiving DTaP-IPV/Hib. We explored factors associated with co-administration of DTaP-IPV/Hib and HepB on the same day.

Methods. This was a retrospective study using the MarketScan® commercial claims and encounters database. Infants born from 1 July 2010 - 30 June 2016, continuously enrolled in an insurance plan for ≥ 13 months and receiving ≥ 3 DTaP-IPV/Hib doses were included.

Infants were assessed for HepB claims relative to the first and third DTaP-IPV/Hib doses. Because a HepB birth dose was assumed, the first HepB claim from 29 - 169 days following birth was counted as Dose 2, and the second claim from 170 days - 12 months as Dose 3. Associations between demographic, provider, and insurance characteristics, receipt of other pediatric vaccines, and co-administration of DTaP-IPV/Hib and HepB were analyzed using multivariate logistic regression.

Results. Among 165,553 infants who received a first DTaP-IPV/Hib dose, 60.7% received HepB Dose 2 on the same day. Among 162,217 infants who received a third DTaP-IPV/Hib dose, 45.1% received HepB Dose 3 on the same day.

Infants in the Northeast were less likely (OR=0.38, 95%CI=0.36-0.39), while those in the West were more likely (OR=1.41, 95%CI=1.36-1.46) than infants in the South to receive the first dose of DTaP-IPV/Hib and HepB Dose 2 on the same day. Infants vaccinated by pediatricians (OR=0.54, 95%CI=0.53-0.55) were less likely to receive the first dose of DTaP-IPV/Hib and HepB Dose 2 on the same day compared to infants vaccinated by family physicians. Infants who received PCV on the same day as the first dose of DTaP-IPV/Hib were more likely to receive HepB Dose 2 (OR=6.96, 95%CI=6.30-7.70) that day. These factors were also associated with co-administration of the third dose of DTaP-IPV/Hib and HepB Dose 3.

Conclusion. Differences in co-administration of DTaP-IPV/Hib and HepB were associated with region of residence, provider type and co-administration of PCV. The reasons underlying these differences merit exploration. A hexavalent vaccine containing DTaP, IPV, Hib, and HepB could improve timeliness of HepB vaccination, while reducing the number of injections during infancy.

Disclosures. Tanaz Petigara, PhD, Merck & Co., Inc. (Employee, Shareholder) Ya-Ting Chen, PhD, Merck & Co., Inc. (Employee, Shareholder) Zhiwen Liu, PhD, Merck & Co., Inc., (Employee) Michelle Goveia, MD, Merck & Co., Inc (Employee, Shareholder) David Johnson, MD, MPH, Sanofi Pasteur (Employee, Shareholder) Gary S. Marshall, MD, GlaxoSmithKline (Consultant, Scientific Research Study Investigator)Merck (Consultant, Scientific Research Study Investigator)Pfizer (Consultant, Scientific Research Study Investigator)Sanofi Pasteur (Consultant, Grant/Research Support, Scientific Research Study Investigator, Honorarium for conference lecture)Seqirus (Consultant, Scientific Research Study Investigator)

1394. Impact of 7-Valent and 13-Valent Pneumococcal Conjugate Vaccines in the United States: A Systematic Literature Review

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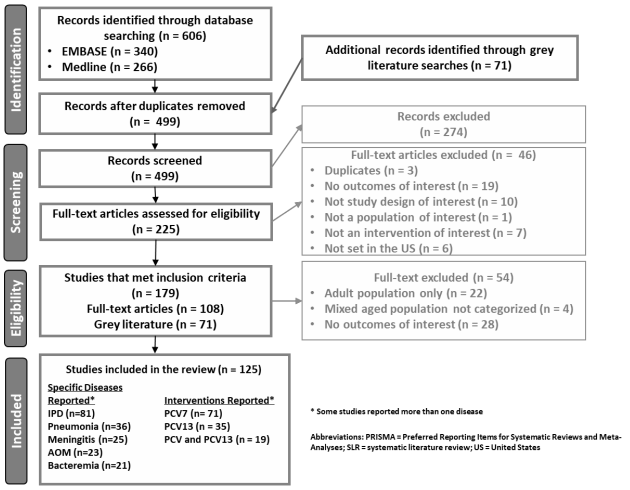
Session: P-63. Pediatric Vaccines

Background. The availability of 7-valent (PCV7) and 13-valent (PCV13) pneumococcal conjugate vaccines (PCVs) in the United States (US) since 2000 and 2010, respectively, has substantially reduced the occurrence, morbidity and mortality of pneumococcal disease. This systematic literature review aimed to assess the impact of the PCVs in reducing the pneumococcal disease burden since their introduction.

Methods. We searched Embase and Medline and disease-surveillance websites for observational studies of US participants < 19 years, published 1999–2019 and reporting incidence or prevalence of acute otitis media, invasive pneumococcal disease, meningitis, or pneumococcal disease-related morbidity, mortality, healthcare resource utilization (HCRU) or costs.

Figure. SLR Results - PRISMA Flow Chart

Results. Of 499 citations identified from the databases and other sources, 125 met inclusion criteria (Figure), all indicating clear reductions in multiple manifestations of pneumococcal disease with PCV7 and PCV13 use. However, variations across studies in outcomes reported, study years, and age strata, confounded assessment of vaccine impact on specific pneumococcal disease outcomes and key burden indicators, such as tympanostomy tube placement and antibiotic prescriptions.



Conclusion. PCVs have greatly decreased multiple manifestations of pneumococcal disease in the US. However, granular data on the frequency and morbidity associated with specific pneumococcal diseases and on associated HCRU are needed to quantify the public-health impact of these vaccines.

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1395. Influenza B-Associated Pediatric Mortality in the US Between 2010 and 2019

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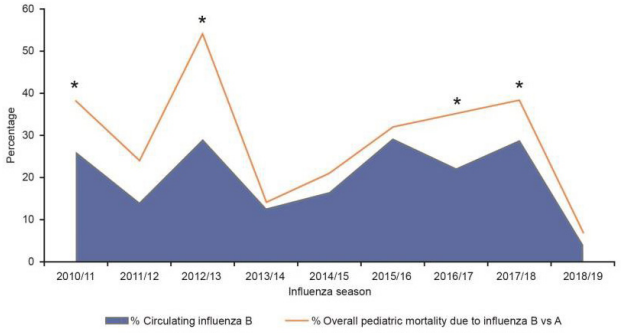
Session: P-63. Pediatric Vaccines

Background. To assess the contribution of influenza B to mortality in the US pediatric population, we analyzed the proportion of influenza-associated pediatric mortality attributed to influenza A and B over nine influenza seasons using national surveillance data. The effectiveness of influenza vaccines against influenza B in the pediatric population was also assessed.

Methods. The study period was the 2010/11 to 2018/19 influenza seasons. Proportions of circulating strains in the general population and influenza-associated pediatric mortality for each season were obtained from annual Centers for Disease Control and Prevention Morbidity and Mortality Weekly Reports on influenza. A Chi-squared test with Yates' correction was used to assess the contribution of influenza B to pediatric mortality relative to its circulation among influenza viruses. Consolidated vaccine effectiveness (VE) against influenza B for inactivated influenza vaccine (IIV) in the 2010/11 to 2017/18 seasons and live attenuated influenza vaccine (LAIV) in the 2010/11 to 2015/16 seasons were obtained from a published meta-analysis and annual US Flu VE Network studies. There were no US data on LAIV VE for 2016/17 and 2017/18.

Results. During the 2010/11 to 2018/19 seasons, influenza B accounted for 4.0%–29.2% of all circulating influenza strains. A/H3N2 viruses were the predominant circulating strain in most seasons. In the same period, influenza B accounted for 7.0%–54.1% of pediatric influenza-associated mortality (Figure). The proportion of influenza B-related deaths was significantly higher ($p< 0.01$) than what would have been expected based on the proportion of circulating influenza B strains in the general population, overall and in the 2010/11, 2012/13, 2016/17, and 2017/18 seasons. Point estimates of VE against influenza B for children aged 2–17 years ranged from 33%–70% for IIV between 2010/11 and 2017/18, and from 53%–82% for LAIV between 2010/11 and 2015/16.

Proportion of circulating influenza B strains compared with influenza B-associated pediatric mortality in the US between the 2010/11 and 2018/19 seasons



*$p<0.001$ for the difference between the contribution of influenza B to mortality versus its overall circulation. Criterion for statistical significance is $p<0.05$

US, United States

Conclusion. During the study period, influenza B accounted for a disproportionate percentage of pediatric mortality in the US relative to its overall circulation. These data counter the perception that influenza B is less severe than influenza A in children and highlight the importance of influenza vaccination to prevent influenza and its complications.

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1396. Live Virus Vaccination Following Pediatric Liver Transplantation: Results from Two Academic Children's Hospitals

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Session: P-63. Pediatric Vaccines

Background. Guidelines for immunization following solid organ transplantation discourage live virus vaccination (LVV) in most recipients. Single-center studies support LVV as safe and effective in orthotopic liver transplant (OLT) recipients on steroid-free immunosuppression (IS). We retrospectively evaluated LVV after OLT at 2 pediatric hospitals.

Methods. Records from OLT recipients between Jan 2007 and Dec 2017 at Lurie Children's (Chicago) and Children's Hospital of Philadelphia were reviewed. Patients who underwent OLT at either institution, had ≥ 2 years of follow up, and had documentation of vaccination prior to OLT were included. Adverse events (AEs) within two weeks of receipt of LVV were captured. Factors that might influence the selection of patients for LVV were reviewed, including choice, dose, frequency, and levels of IS medications. IS in non-vaccinated patients was compared to vaccinated patients at two year post-transplant follow-up in both groups using Chi-Square and T-test.

Results. Data from 249 patients met inclusion criteria. Varicella zoster (VZV) vaccine was given at least once to 92 patients post-transplant, and MMR to 91 (Table 1). Compared to patients who were re-vaccinated after transplant, those who received their first LVV after OLT were transplanted at a younger age (0.8 v 2.2 years) and received LVV sooner post-OLT (649 v 907 days). AEs were rare for either LVV: 2 experienced injection site reaction, 2 localized rash, and 1 had fever. One recipient experienced worsening rejection one month after MMR and received IV steroids and increased IS, but had no clinical findings concerning for viral infection from vaccination. Most LVV recipients were on a single IS agent both at time of LVV and 2 year post-OLT (Table 2), with tacrolimus the most frequent agent. Compared to those that did not received LVV post-OLT, those that did were on one IS agent more often. Tacrolimus levels were similar among patients receiving LVV post-OLT compared with those who did not.

Table 1

Table 1: Characteristics of OLT recipients receiving live virus vaccines (LVV) after transplantation	
Patients undergoing transplantation, N	249
Patients with ≥1 liver transplant, N (%)	15 (6%)
Patients receiving ≥1 LVV	96 (38.5%)
VZV, N (%)	92 (36.9)
MMR, N (%)	91 (36.5)
Patients with 1st LVV given after OLT	
Age at OLT, years (median)	0.77[a]
VZV, N (%)	54 (21.7)
MMR, N (%)	58 (23.2)
Time of 1st LVV after OLT, days (median)	649[b]
Patients re-vaccinated with LVV after OLT	
Age at OLT, years (mean)	2.24
VZV, N (%)	38 (15.3)
MMR, N (%)	32 (12.9)
Time of 1st LVV after OLT, days (median)	907
Adverse events	
Patients with 1st LVV given after OLT	
VZV vaccine, N of AEs (% of vaccinated pts)	2 (3.7)
Injection site reaction	1
Localized rash	1
MMR vaccine, N of AEs (% of vaccinated pts)	2 (3.4)
Injection site reaction	1
Rejection episode	1
Patients with history of ≥1 LVV prior to OLT	
VZV vaccine, N of AEs (% of vaccinated pts)	1 (2.6)
Fever post-vaccination	1
MMR vaccine, N of AEs (% of vaccinated pts)	1 (3.1)
Fever post-vaccination	1

Table 2

Table 2: Immunosuppressive regimens in patients administered and not administered LVV		
Number of immunosuppressive medications at time of LVV	1	>1
Patients with 1st LVV given after OLT		
VZV vaccine, N (%)[c]	43 (81.1)	10 (18.9)
MMR vaccine, N (%)[c]	46 (80.7)	11 (19.3)
Patients re-vaccinated after OLT		
VZV vaccine, N (%)	33 (86.8)	5 (13.2)
MMR vaccine, N (%)	29 (90.6)	3 (9.4)
Number of immunosuppressive medications 2 years after OLT	1	>1
Patients with 1st LVV given after OLT[d]		
VZV vaccine, N (%)	41 (77.4)	12 (22.6)
MMR vaccine, N (%)	44 (77.2)	13 (22.8)
Patients re-vaccinated after OLT[d]		
VZV vaccine, N (%)	29 (76.3)	9 (23.7)
MMR vaccine, N (%)	25 (78.1)	7 (21.9)
Patients who did not receive LVV after OLT[d,e]	89 (62.7)	53 (37.3)
Tacrolimus levels (ng/dL) 2 years after OLT, Mean (SD)		
Patients with 1st LVV given after OLT	4.84 (1.75)[f]	
VZV vaccine	4.91 (1.74)	
MMR vaccine	4.84 (1.75)	
Patients re-vaccinated after OLT	6.34 (3.07)	
VZV vaccine	6.34 (3.07)	
MMR vaccine	6.20 (2.90)	
Patients who did not receive LVV after OLT[e]	5.66 (2.31)	

a. Median for age at OLT for 1st LVV vs re-vaccinated was significantly different (p=0.000)
b. Median for days post OLT for 1st LVV vs re-vaccinated was significantly different (p=0.007)
c. One patient did not have any IS agents documented at the time of LVV vaccination
d. Those who received LVV post-OLT were significantly more often on one IS agent at 2 year post-OLT follow-up compared to those who did not receive LVV (p=0.025)
e. There was no significant difference (p=0.317) for tacrolimus levels at 2 year follow up for those receiving LVV after OLT compared to those that did not receive LVV after OLT

Conclusion: In a series of pediatric OLT recipients, post-OLT LVV was generally safe and well tolerated. Patients who received LVV post-OLT were more often on one IS agent at 2 year follow up compared to those who did not. Our study supports prospective efforts to define guidelines for patients who may safely receive LVV after OLT.

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