2707. Non 13-Valent Pneumococcal Conjugate Vaccine Serotypes Predominate as Causes of Pneumococcal Otitis Media in Children

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Session: 277. Vaccines: Bacterial Saturday, October 5, 2019: 12:15 PM

Background: Pneumococcal acute otitis media (AOM) in children due to vaccine-related serotypes (ST) has declined after the introduction of the 13-valent pneumococcal conjugate vaccine (PCV13), although some serotypes, such as 19A and 19F have persisted. Among non-vaccine serotypes, 35B has been shown to contribute substantially to both OM and invasive infections. This study describes the current epidemiology of pneumococcal OM isolates obtained from the U S Pediatric Multicenter Pneumococcal Surveillance Group (USPMPSG).

Methods: From the USPMPSG database, we collected data from patients <18 years of age with pneumococcal OM isolates from 2014 to 2018. Analysis included demographic, immunization status, antimicrobial susceptibility data and serotype. Statistical comparisons included Fisher’s exact and Wilcoxon rank-sum tests.

Results: A total of 494 patients with isolates were identified within the time period from February 2014 to April 2018. Analysis included demographic, immunization status, antimicrobial susceptibility data and serotype. Statistical comparisons included Fisher’s exact and Wilcoxon rank-sum tests. A total of 494 patients with isolates were identified within the time period from February 2014 to April 2018. Analysis included demographic, immunization status, antimicrobial susceptibility data and serotype. Statistical comparisons included Fisher’s exact and Wilcoxon rank-sum tests.

Conclusion: Although PCV7-type IPD has decreased substantially, only a modest reduction in IPD has been observed with the introduction of PCV13. As a result, non-vaccine serotypes, including 19A and 19F, have become more prevalent as causes of OM and IPD resulting in a need for increased surveillance.

Disclosures. All authors: No reported disclosures.

2708. Genetic Structure of Streptococcus pneumoniae Isolated from Invasive Disease in Korea, 2014–2018

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Session: 277. Vaccines: Bacterial Saturday, October 5, 2019: 12:15 PM

Background: The extended-valency pneumococcal conjugate vaccines (PCVs) were implemented into Korean national immunization program in 2014. This study investigated the change in genetic structures of Streptococcus pneumoniae causing invasive pneumococcal disease (IPD) in Korean children after 10- and 13-valent conjugate vaccine (PCV10 and PCV13, respectively).

Methods: Between January 2014 and December 2016, invasive isolates were collected from 23 hospitals throughout Korea. Cases of IPD were defined by isolating pneumococci from normally sterile sites. Each pneumococcal isolate was identified using standard microbiological techniques and serotyped by Quellung reaction. The multi-locus sequence typing (MLST) was analyzed for randomly selected isolates.

Results: A total of 91 pneumococcal isolates were analyzed. Common serotypes were 10A (18.7%), 12F (11.0%), 15A (9.9%), 19A (9.9%), 15B (7.7%), 23A (6.6%), 35B (5.5%), and 23B (4.4%). The isolates belonged to 38 sequence types (STs), including 4 newly discovered STs. Of the 4 clonal complexes (CCs), 3 clonal complexes were antibiotic-resistant international clones. CC166 (11.9%) were associated with non-vaccine serotypes (NVTs; 11A, 15B/C, 2A, and 13). Serotypes of CC320 (10.9%) comprised of serotype 19A and 19F. The main serotypes responsible for CC81 (10.9%) were serogroup 15. New serotype-ST combinations were observed, especially in serotype 13 and serogroup 15. Also, a possibility of capsular switch event was noted between serogroup 6 and serogroup 15A.

Conclusion: The introduction of extended-valency PCVs has resulted in the change of the genetic structure of pneumococcal isolates in Korean children. This study demonstrates that selective pressure from PCV10/13 caused predominant serotypes to be NVTs and genetic changes such as capsular switch events.

Disclosures. All authors: No reported disclosures.

2709. Immune Response After Diphtheria and Tetanus Toxoid Booster in Patients with Adult-Onset Immunodeficiency with Anti-interferon-γ Autoantibody

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Session: 277. Vaccines: Bacterial Saturday, October 5, 2019: 12:15 PM

Background: Immune response to tetanus and diphtheria disease. Nevertheless, in previous observational study, low seroprotection rate of both diphtheria and tetanus were observed in Thai healthy population. Reduced-dose diphtheria and tetanus toxoid vaccine (dT) was recommended to all adult patients regardless of immunologic status. However, data on vaccine efficacy in interferon gamma (IFN-γ) autoantibody patients were limited. We therefore conducted clinical study to evaluate efficacy and safety of one dose of dT in IFN-γ autoantibody patient compared with healthy individuals at 4 weeks after vaccination.

Methods: Study was conducted from February to April 2019. Total 18 patients with confirmed IFN-γ autoantibody were enrolled. Baseline diphtheria and diphtheria serologic study and 4 weeks after vaccination were examined. Antibody levels were measured with a solid-phase IgG-specific ELISAs (EUROIMMUN, Germany). Geometric mean titer (GMTs) were calculated using the log transformation of serological titters and from taking the antilog mean of the transformed values.

Results: Seroprevalence of tetanus was 94.5% in healthy population compared with 60.1% in IFN-γ autoantibody patients. While, seroprevalence of diphtheria was 78.8% and 77.8%, respectively. After vaccination, all healthy adults had reached seroprotection level in both diphtheria and tetanus. For patients with IFN-γ autoantibody, 88.9% and 94.4% had anti-tetanus toxoid IgG and anti-diphtheria toxoid IgG level above 0.1 IU/mL, respectively. These results indicated seroconversion rate of 71% for tetanus and 75% for diphtheria after dT vaccination (Table 2). In the subgroup analysis, unboosted IFN-γ autoantibody patient had lower tetanus seroconversion rate compared with previously boosted patient (50% vs 100%). Active infection was also associated with lower immune response after tetanus vaccination. There was no severe adverse event in both group.

Conclusion: This is the first study on immune response after dT vaccination in IFN-γ autoantibody patient. Seroconversion rate of dT vaccine in IFN-γ autoantibody patient were slightly lower than healthy adults. Active infection and previously unboosted patient provided lower immune response of tetanus.

Figure: Pneumococcal Serotypes Causes Otitis Media, 2018-2018

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