203. Activity of Cefepime in Combination with Taniborbactam (formerly VRNX-5133) Against Pseudomonas aeruginosa from a Global 2018-2020 Surveillance Collection

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Session: O-40 What’s New in Antimicrobial Resistance

Background. Taniborbactam is a novel cyclic boronate-based broad-spectrum β-lactamase inhibitor with potent and selective inhibitory activity against both serine- and metallo-β-lactamases (MBLs). Taniborbactam restores the activity of the investigational combination cefepime-taniborbactam against MDR P. aeruginosa isolates. As for the breadth of coverage provided by these vaccines, available data show

Methods. MICs of FEP with taniborbactam fixed at 4 µg/mL (FTB) and cefepime (FEP) against many multidrug-resistant organisms, including cephalosporin-resistant Enterobacterales and Pseudomonas aeruginosa (PA). We evaluated the in vitro activity of the investigational combination cefepime-taniborbactam and comparators against clinical isolates of PA collected during a 2018-2020 surveillance.

Results. Overall, 28.7%, 26.2% and 20.3% of PA isolates were nonsusceptible (NS) to piperacillin-tazobactam (TZP), MEM or FEP, respectively (Table). FTB demonstrated potent activity (MIC<4/2 µg/mL; 94.2% inhibited at ≤8 µg/mL) against PA overall and inhibited between 63.4% (ceftazidime-avibactam [CZA]+) and 82.1% (TZP) of isolates in the NS subsets. Against 111 strains carrying VIM or NDM MBL genes, 67.6% had FTB MICs ≤8 µg/mL, with 11% having FTB MICs of 16 µg/mL. Plausible explanations for elevated FTB MICs included IMP MBL genes, penicillin binding protein 3 variations, and/or possible efflux pump up-regulation.

Results.

Conclusion. FTB demonstrated potent in vitro activity against PA with different resistance profiles, including NS to FEP, MEM, and TZP, and to the β-lactams CZA, cefotaxime-tazobactam, and meropenem-vaborbactam. FTB was the most active agent tested against PA harboring VIM and NDM MBLs. These findings support the continued development of FTB as a potential new treatment option for challenging infections due to MDR PA.

Disclosures. Meredith Hackel, PhD MPH, IHMA (Employee) Pfizer, Inc.

01. Serum Bacterial Activity Against Circulating and Reference Strains of Meningococcal Serogroup B in the United States: A Review of Meningococcal Serogroup B (MenB) Vaccines in Adolescents and Young Adults

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Session: P-01. Adolescent Vaccines

Background. US adolescents and young adults are at particular risk of invasive meningococcal disease (IMD). In 2018, meningococcal serogroup B was responsible for 36% of IMD cases in the US overall and for 66% of cases in adolescents and young adults. This age group is at high risk of IMD during outbreaks, which result in significant response-related costs. MenB vaccine efficacy against IMD relies on its ability to provide broad protection against diverse disease-causing strains. MenB-FHbp (Trumeno) and MenB-4C (Bexsero) are MenB vaccines licensed in the US as 2-dose series with an interval of 6 mo or 1 mo, respectively, recommended in healthy adolescents and young adults. We review available data on vaccine coverage of serogroup B strains.

Methods. A literature review identified relevant information from peer-reviewed publications, congress presentations, and ClinicalTrials.gov. Previously presented but unpublished data from phase 2/3 studies were included.

Results. After 2 MenB-FHbp doses, percentages of adolescents and young adults achieving serum bactericidal activity assay using human complement (hSBA) titer ≥1:8 were 79%–99% for 4 heterologous representative test strains and 71%–97% for 10 additional strains, confirming cross-protection against a diverse strain panel (Figure 1; unpublished data). These 14 heterologous strains collectively represent ~80% of disease-causing strains in the US and Europe. In a published study with limited sample size, 94% of subjects had hSBA titers ≥1:16 against strains from 4 US college outbreaks after 2 MenB-FHbp doses. After 2 MenB-4C doses, percentages of 10–25-year-olds achieving hSBA titers ≥1:16 against 3 reference strains homologous to the vaccine antigen were 82%–93% (published data); 15%–100% of adolescents achieved hSBA titers ≥1:4 against a panel of 14 strains (unpublished data). Of college students who received 2 MenB-4C doses, 53%–93% achieved hSBA titers ≥1:4 against 5 US outbreak strains (4/5 strains had antigenic similarity to MenB-4C, published data).

Conclusion. MenB-FHbp and MenB-4C protect against various serogroup B strains. As for the breadth of coverage provided by these vaccines, available data show that MenB-FHbp elicits robust immune responses to a wide variety of disease-causing strains prevalent in the US (Figure 2).

Disclosures. Tamera Coyne-Beasley, MD, MPH, Pfizer Inc and GlaxoSmithKline (Advisor); Joseph Bocchini, MD, Pfizer Inc and Dynavax (Advisor or Review Panel member); Alejandro Cane, M.D., Pfizer Inc (Employee, Shareholder) Cindy Burman, PharmD, Pfizer Inc (Employee, Shareholder)

Figure 1. Adolescents and young adults with hSBA titers ≥1:4 against 5 serogroup B strains before and 1 month after dose 2 of MenB-FHbp.

Figure 2. Summary of MenB-FHbp and MenB-4C characteristics and available data.