MAR Pulmonology & Respiratory Medicine (2025) 8:1

Editorial Article

Pneumococcal Vaccination and COVID-19 Vaccination Co-Administered in the Elderly

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Received: 24 Mar 2025

Published: 02 Apr 2025

With varying serotype coverage, pneumococcal polysaccharide and conjugate vaccines are recommended by the US Centers for Disease Control and Prevention (CDC) for children ≤5 years of age, adults ≥50 years of age, and children and adults at increased risk of pneumococcal disease (PD) [1, 2]. With a favorable safety profile, pneumococcal vaccines have a long history of use and have been demonstrated to be immunogenic and effective [3]. These vaccines with the mainstay of disease prevention and have contributed to a substantial decrease in cases of respiratory disease burden, invasive pneumococcal disease (IPD), and healthcare utilization [4, 5]. The 23-valent pneumococcal polysaccharide vaccine is a widely used pneumococcal vaccine (PPSV23; Pneumovax® 23, Merck Sharp & Dohme LLC, a subsidiary of Merck & Co., Inc., Rahway, NJ, USA [MSD]). PPSV23 is indicated for the prevention of PD in older adults ≥50 years of age and individuals ≥2 years of age with certain medical conditions that can contribute to an increased risk of PD. PPSV23 contains 23 different serotypes of Streptococcal pneumoniae (S. pneumoniae) (serotypes 1, 2, 3, 4, 5, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19A, 19F, 20, 22F, 23F, and 33F) [6-10]. A 15-valent pneumococcal conjugate vaccine (PCV15; VAXNEUVANCE™, MSD) is indicated in individuals ≥6 weeks of age for the prevention of IPD and pneumonia, and in individuals 6 weeks to ≤18 years of age for acute otitis media, caused by S. pneumoniae serotypes contained in the vaccine (1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, 22F, 23F, and 33F) is also available in many countries [11]. The CDC recommends that, in adults, administration of PCV15 should be followed by a single dose of PPSV23 one year later [10, 12].

The current variants of COVID-19 are less dangerous than previous strains, but can still cause serious illness, especially in susceptible [14] patients, such as the elderly [13, 15]. In this vulnerable patient group, vaccination against SARS-CoV-2 remains one of the most important strategies for reducing morbidity and mortality. Although COVID-19 is no longer classified as a public health emergency of international concern by the World Health Organization (WHO), it continues to pose a global health burden [13]. Another important group of pathogens causing serious respiratory infection are the various serotypes of S. pneumoniae, commonly referred to as pneumococci. A large prospective cohort study from the United Kingdom (UK) found that pneumococci are detectable in approximately, 10% of patients hospitalized with a lower respiratory tract infection [16]. Around 75% of the serotype would have been covered by the commonly used 20-valent polysaccharide conjugate pneumococcal vaccine (PCV20), which is recommended for adults with 60 or 65 years of age and older, depending on the country or geographical region. Given the overlapping risk populations, combined administration of Novavax's (NVX) new Omicron-adapted vaccine (NVX-CoV2601) and the PCV20 could be a viable immunization strategy for a large proportion of the population. Despite

extensive literature on the topic of concurrent vaccination, there is still conflicting evidence as to whether the administration of COVID-19 vaccines in combination with other vaccines is associated with worse immunogenicity and reactogenicity. Co-administration of the NVX-CoV2601 and PCV20 vaccines has not yet been studied. The primary purpose of many investigator-initiated, randomized, double-blind, placebo-controlled studies are to investigate whether combined administration of NVX-COV2601 and PCV20 vaccine is non-inferior to administration of NVX-COV2601 alone in terms of immunogenicity against SARS-CoV-2 in adults aged 60 years or older [16].

In conclusion, there were scientific evidences that the co-administration of mRNA-1273 with PPSV23 or PCV15 in healthy adults ≥50 years of age was immunogenic, with a safety profile comparable to administering mRNA-1273, compared with a placebo. With a good safety profile, COVID-19 vaccines are effective when administered concomitantly with other vaccines, including pneumococcal vaccines. These findings could develop future vaccination recommendations or vaccination guidelines, enhance vaccine program implementation, and potentially assist to increase coverage rates for other licensed vaccines. In a recent study, demonstrated that no safety concerns with the concomitant administration of NVX-COV2601 with a PCV20 vaccine [16].

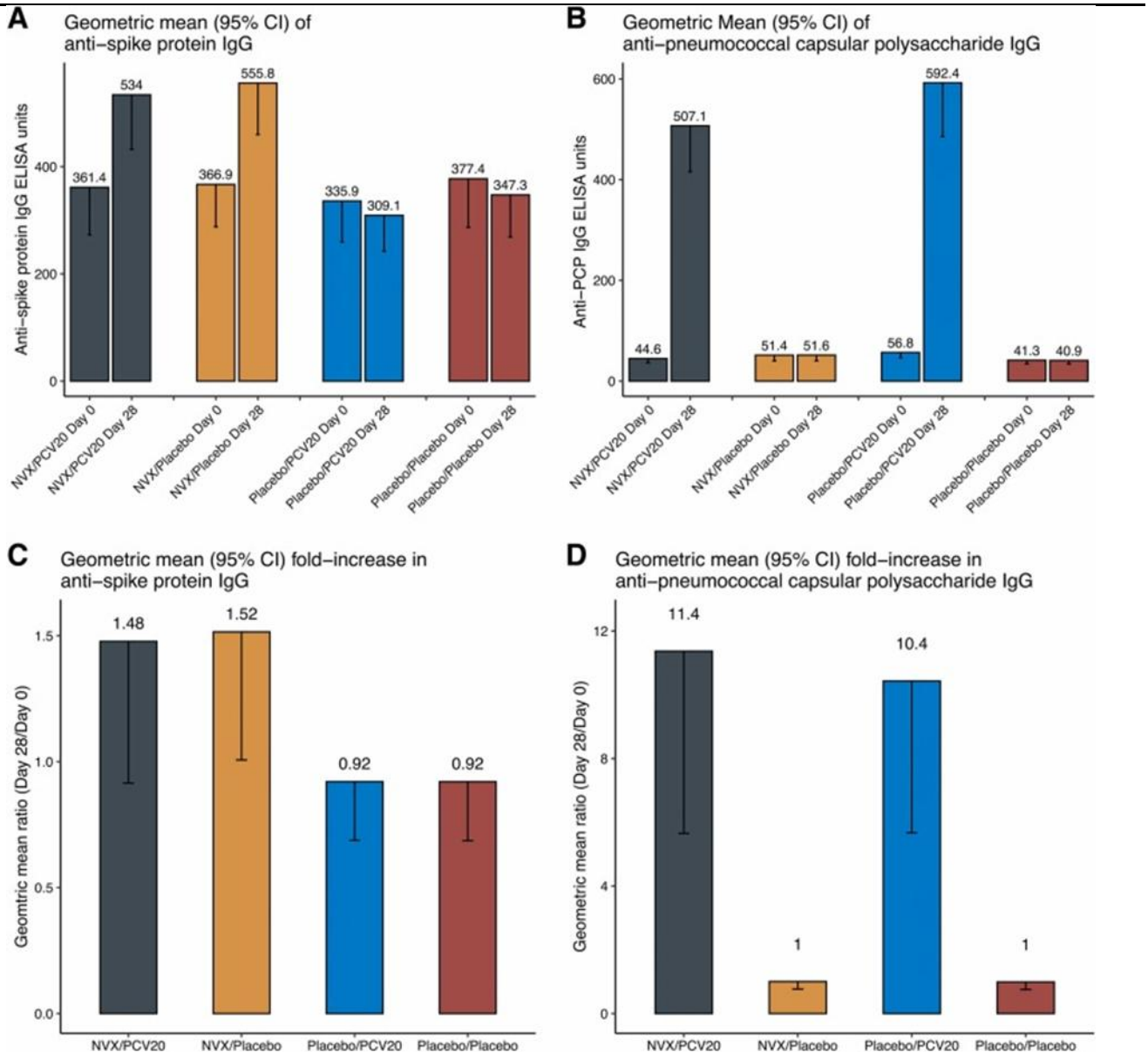

Figure 1 Demonstrating the geometric mean anti-spike protein (A and C) and anti-pneumococcal capsular polysaccharide (B and D) IgG ELISA units at baseline and 28 days post-vaccination and the fold increase in antibody levels in the four groups. Abbreviations: anti-PCP, anti-pneumococcal capsular polysaccharides; NVX, NVX-CoV2601; PCV20, 20-valent pneumococcal conjugate vaccine [16].

Immunogenicity data. NVX-COV2601 plus PCV20, NVX-COV2601 plus Placebo, PCV20 plus Placebo, Placebo plus Placebo [16]

Anti-SARS-CoV-2 immunogenicity [16]

Geometric mean (95% CI) anti-spike protein IgG ELISA units at Day 0 361.4 (272.7−479) 366.9 (287.8−467.7) 335.9 (259.3−435) 377.4 (286.8−496.6)

Geometric mean (95% CI) anti-spike protein IgG ELISA units at Day 28 : 534 (432.3−659.7) 555.8 (459.9−671.7) 309.1 (242−395) 347.3 (268.7−448.9)

Geometric mean (95% CI) anti-spike protein fold increase 1.48 (1.25−1.75) 1.52 (1.33−1.72) 0.92 (0.88−0.96) 0.92 (0.88−0.96)

Anti-pneumococcal immunogenicity [16]

Geometric mean (95% CI) anti-pneumococcal capsular polysaccharide IgG ELISA units at Day 0 : 44.6 (36.2−55) 51.4 (40.1−65.9) 56.8 (46.4−69.5) 41.3 (34.1−50)

Geometric mean (95% CI) anti-pneumococcal capsular polysaccharide IgG ELISA units at Day 28 : 507.1 (415.6−618.7) 51.6 (40.3−65.9) 592.4 (485.4−722.9) 40.9 (33.8−49.5)

Geometric mean (95% CI) anti-pneumococcal capsular polysaccharide fold increase 11.37 (8.75−14.77) 1 (0.98−1.02) 10.43 (8.31−13.1) 0.99 (0.97−1.01)

Statistical comparison of immunogenicity outcomes between the active treatment groups including the primary endpoint.

NVX-COV2601 plus PCV20 NVX-COV2601 plus Placebo PCV20 plus Placebo

Geometric Mean Ratio (95% CI) Anti-SARS-CoV-2 immunogenicity

Geometric mean (95% CI) anti-spike protein IgG ELISA units at Day 0 : 361.4 (272.7−479) 366.9 (287.8−467.7) - 0.99 (0.68−1.42)

Geometric mean (95% CI) anti-spike protein IgG ELISA units at Day 28 : 534 (432.3−659.7) 555.8 (459.9−671.7) - 0.96 (0.73−1.27)

Geometric mean (95% CI) anti-spike protein fold increase 1.5 (1.2−1.7) 1.5 (1.3−1.7) - 0.98 (0.79−1.2)

Anti-pneumococcal immunogenicity [16]

Geometric mean (95% CI) anti-pneumococcal capsular polysaccharide IgG ELISA units at Day 0 : 44.6 (36.2−55) - 56.8 (46.4−69.5) 0.79 (0.59−1.05)

Geometric mean (95% CI) anti-pneumococcal capsular polysaccharide IgG ELISA units at Day 28 : 507.1 (415.6−618.7) - 592.4 (485.4−722.9) 0.86 (0.65−1.13) Geometric mean (95% CI) anti-pneumococcal capsular polysaccharide fold increase 11.37 (8.75−14.77) - 10.43 (8.31−13.1) 1.09 (0.77−1.54) [16]

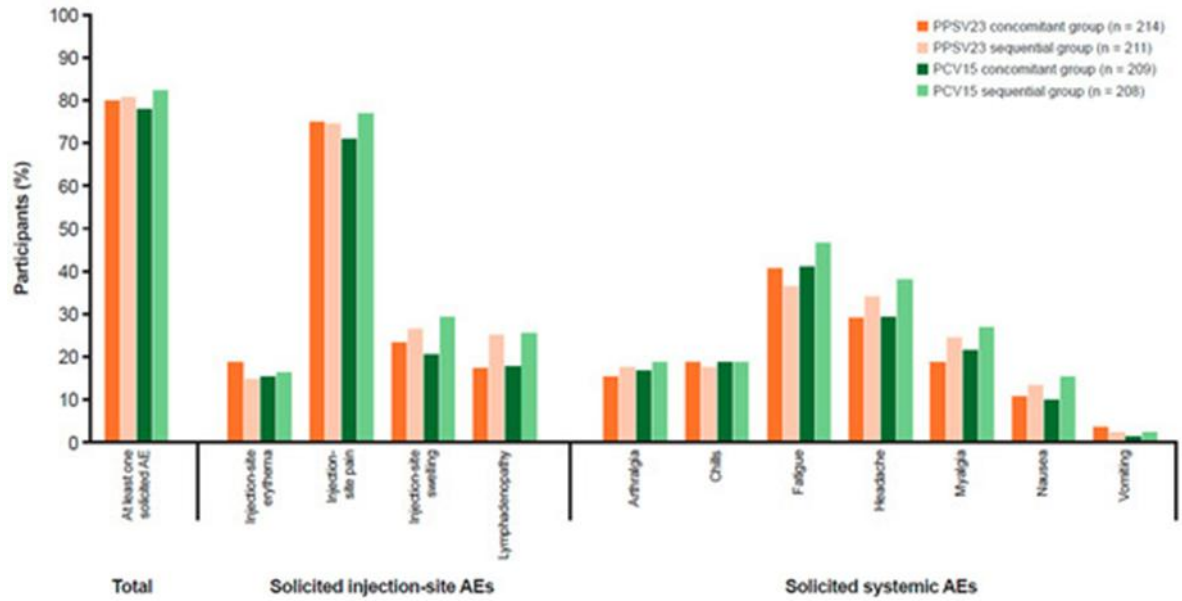

Figure 2 Demonstrating participants with solicited AEs (incidence >0% in one or more group) in the all-participants-as-treated population following any vaccination. Every participant was counted a single time for each AE. Injection-site erythema, injection-site pain, injection-site swelling, headache, fatigue, chills, nausea, vomiting, myalgia arthralgia, and lymphadenopathy were solicited from Day 1 to Day 7 following vaccination. MedDRA version 26.0 was used [17].

Abbreviations:

AE: adverse event; MedDRA: Medical Dictionary for Regulatory Activities; PCV15: 15-valent pneumococcal conjugate vaccine; PPSV23: 23-valent pneumococcal polysaccharide vaccine [17].

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DOI : https://doi.org/10.3390/vaccines13020192.

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