Efficacy of Pneumococcal Vaccine in Patients with Inflammatory Bowel Disease: A Propensity Matched Study

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BACKGROUND

- Studies have shown patients with inflammatory bowel disease (IBD) are at an increased risk for pneumococcal disease (PD) and invasive PD
- Patients with IBD should receive 13-valent pneumococcal conjugate vaccine (PCV13) followed by the 23-valent pneumococcal polysaccharide vaccine (PPSV23) after 8 weeks and a single booster of PPSV23 5 years later
- There is concern for decreased immunogenicity from vaccines compared to general population

AIM

- Evaluate the efficacy of pneumococcal vaccine and outcomes of pneumonia in vaccinated patients with IBD

METHODS

- Real-time search and analysis of the U.S Collaborative Network in the TriNetX platform containing ~ 85 million patients from 52 health care organizations
- IBD cohort (n=): Adults ≥18 with ICD-10 codes for ulcerative colitis (UC) or Crohn's disease (CD) plus one IBD-related medication who received either PCV13, PPSV23, PCV13+PPSV23 or PCV13 + two doses of PPSV23
  Control cohort: Adults ≥ 18 with IBD who did not receive any pneumococcal vaccine
- Study outcomes: Risk of PD and risk of hospitalization, ICU care and intubation < 30 days and 90-day all-cause mortality
- Propensity score matching was performed for age, gender, race, ethnicity and known risk factors for PD
- Risk expressed as adjusted odds ratio (aOR) with 95% confidence interval (CI)

Figure 1: Distribution of IBD cohort with pneumococcal vaccine based on type of vaccine and number

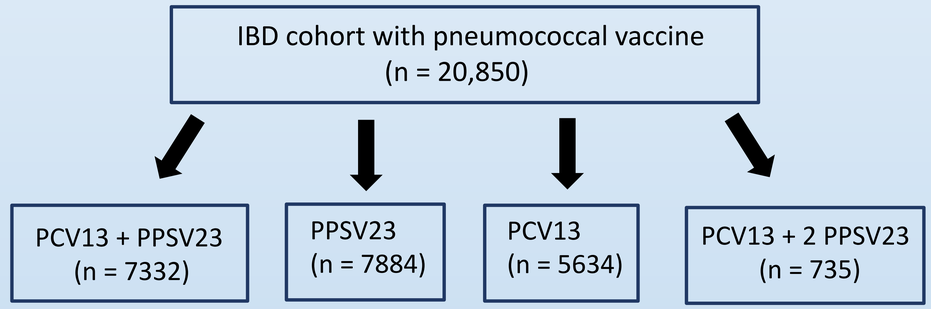

Figure 2: Risk of pneumococcal disease in vaccinated IBD cohort compared to unvaccinated IBD cohort expressed as adjusted odds ratios with 95% confidence intervals

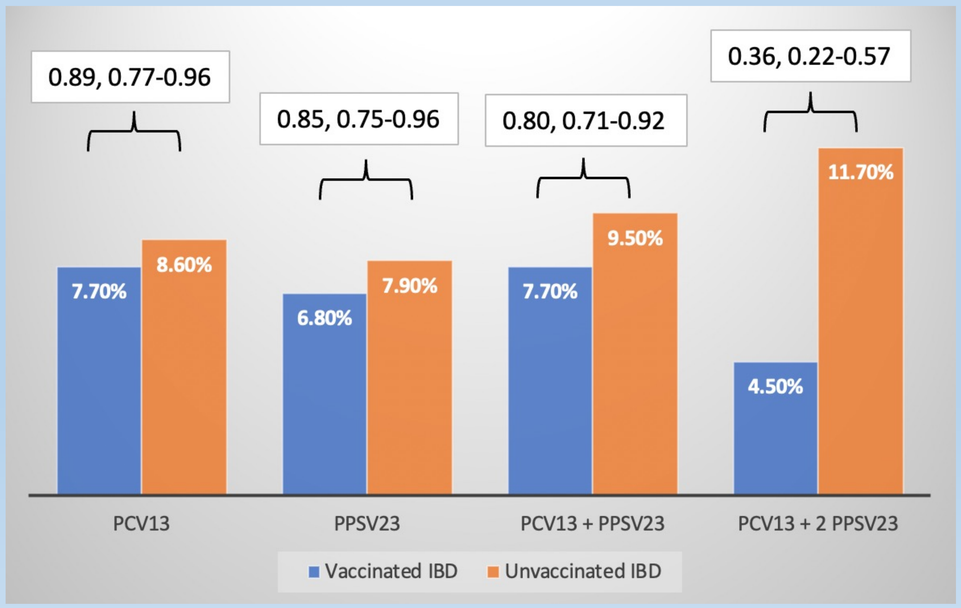

Table 1: Risk of adverse outcomes after PD in vaccinated vs unvaccinated IBD cohort expressed as adjusted odds ratio with 95% confidence interval

Outcome	Vaccine N (%)	Unvaccinated N (%)	aOR	95% CI
PPSV23 + PCV13				
Composite	35 (7.2)	69 (14.2)	0.46	0.30 – 0.71
Hospitalization	122 (25.4)	170 (35.4)	0.62	0.47 – 0.82
ICU care	25 (5.1)	48 (9.9)	0.49	0.30 – 0.81
Intubation	14 (2.8)	27 (5.5)	0.5	0.26 – 0.97
90-day mortality	18 (3.7)	45 (9.3)	0.37	0.21 – 0.66
PCV13				
Composite	10 (2.5)	47 (11.9)	0.19	0.09 – 0.38
Hospitalization	32 (8.1)	103 (26.6)	0.25	0.16 – 0.38
ICU care	10 (2.5)	34 (8.6)	0.27	0.13 – 0.56
Intubation	10 (2.5)	34 (3.3)	0.76	0.33 – 1.76
90-day mortality	0	28 (7.1)	N/A	N/A
PPSV23				
Composite	11 (2.2)	64 (13)	0.15	0.08 – 0.29
Hospitalization	71 (14.4)	139 (28.2)	0.42	0.31 – 0.58
ICU care	10 (2)	48 (9.7)	0.19	0.09 – 0.38
Intubation	10 (2)	28 (5.6)	0.34	0.16 – 0.71
90-day mortality	10 (2)	32 (6.5)	0.29	0.14 – 0.61

DISCUSSION

- PCV23, PCV13 + PPSV23 and PCV13 + 2 PPSV23 were associated with decreased risk of pneumococcal disease in patients with IBD
- Pneumococcal vaccine conferred protection against adverse disease-related outcomes regardless of type of vaccine
- Further research is needed to study the impact of immunosuppressive medications including steroid use on the impact of vaccine efficacy and timing of vaccination

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