Pneumococcal vaccination and immune response in inflammatory rheumatic diseases and in diseases and in splenectomized individuals

Background
Immunosuppressed patients with inflammatory rheumatic disease (IRD) and splenectomized subjects are at risk of serious pneumococcal infections and recommended vaccination with the pneumococcal conjugate vaccine (PCV13) combined with the pneumococcal polysaccharide vaccine (PPV23). The evidence regarding immune response in these populations is scarce.

Methods
1) Measuring of antibody response to PCV13 vaccination using Luminex® (microsphere-based multiplex assay) was performed in previous PPV23 vaccinated patients (n=24) (Paper 1)
2) Patients with systemic vasculitis receiving standard of care therapy (n=49), rheumatoid arthritis patients (RA) without disease modifying anti-rheumatic treatment (DMARDs) (n=50), RA on methotrexate (MTX; n=10), Sjögren’s syndrome patients (pSS; n=15) and controls (n=49) received PCV13. Antibody response were measured using ELISA (serotypes 6B and 23F) and opsonophagocytic activity assay (Paper 2, 3).
3) Patients with IRD on MTX, rituximab or abatacept and controls were vaccinated with PCV13 followed by PPV23. Antibody response was measured using Luminex® (Paper 4).
4) RA patients on MTX (n=10), RA without active treatment (n=10) and controls (n=10) were vaccinated with PCV13 and flow-cytometric analysis of T follicular memory cells and subtypes of these was performed at vaccination and 6 days following vaccination. (Paper 5)

Results
1) In previous PPV23 vaccinated patients 8 of 12 serotypes reached protective antibody levels and 9 of 12 serotypes increased post-PCV13 [1].
2) After vaccination, 65% patients with vasculitis and 71% controls reached protective antibody level for 6B, and 65% patients vs 76 % controls for 23F [2]. Antibody responses (≥2-fold increase) to 6B and 23F were comparable in RA without DMARDs, pSS and controls but lower in RA on MTX [3].
3) Combination of PCV+PPV did not result in increased antibody levels in patients receiving rituximab. Higher antibody levels were observed in RA on abatacept or MTX and the highest in controls.
4) Ongoing study

Conclusions
1) PCV13 can be immunogenic in splenectomized patients with previous PPV23-vaccination.
2) PCV13 is immunogenic in systemic vasculitis patients. Antibody response to PCV13 is sufficient in RA and pSS patients without DMARDs.
3) PPV23-booster is important in previous PCV13-vaccinated DMARD-treated patients except for rituximab.

Published papers