PREVENTION OF ASPLENIC PNEUMOCOCCAL INFECTION
PROTECTING ASPLENIC CHILDREN AND ADULTS AGAINST PNEUMOCOCCAL DISEASE AND IDENTIFYING OPTIMAL IMMUNISATION REGIMENS

Sarah Luu[1], Ian Woolley[1,2], Penelope Jones[3], Denis Spelman[4], Ann Balloch[4], Paul Licciardi[4], Paul Monagle[5], Chris Barnes[5], Mimi Tang[5], Claire-Anne Siegrist[6], Katherine Lee[4], Jim Buttery[1,2,7]

[1] Monash University, Australia, [2] Monash Medical Centre, Monash Health, Australia, [3] The Alfred Hospital, Alfred Health, Australia, [4] Murdoch Children's Research Institute, Australia, [5] Royal Children's Hospital, Australia, [6] University Geneva, Switzerland, [7] Monash Children's Hospital, Australia

Introduction

Individuals with asplenia are at increased risk for life-threatening infection with pneumococcus.

Vaccination can prevent pneumococcal infection.

The optimal vaccination regime has yet to be determined.

Aim

To evaluate the optimal strategy for pneumococcal vaccination in individuals with asplenia by measuring immunological response

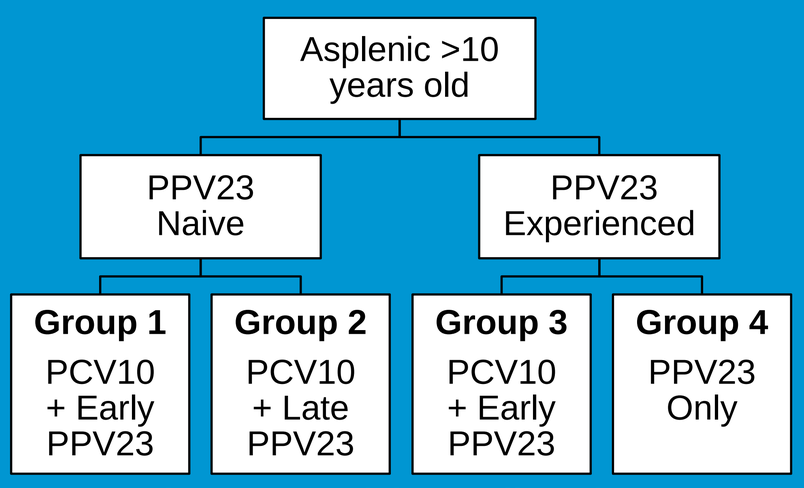

Figure 1. Participant allocation

Methods

Phase IV, multi-centred randomised trial, of individuals with asplenia >10 years of age

- Randomised into groups based on exposure to 23-valent pneumococcal polysaccharide vaccine (PPV23) (Figure 1)
- Received 10-valent pneumococcal conjugate vaccine (PCV10) and/or PPV23 as governed by study arm

Immunogenicity Assessment

- Serum levels of serotype-specific IgG were measured by WHO ELISA
- Functional activity of antibodies were measured by multiplexed opsonophagocytic assay (OPA)

P-value of ≤ 0.01 was considered statistically significant

Results

122 individuals were recruited. Demographic data is described in Table 1.

Vaccination Immunogenicity

- No difference seen in quantitative or functional response in all serotypes 6-weeks after early and late PPV23 vaccination post-PCV10 ($p>0.05$).
- Vaccination with PCV10 and PPV23 in PPV23 experienced subjects resulted in increased quantitative response to only serotype 4 ($p=0.002$) and similar functional responses compared with PPV23 alone, see Figure 2

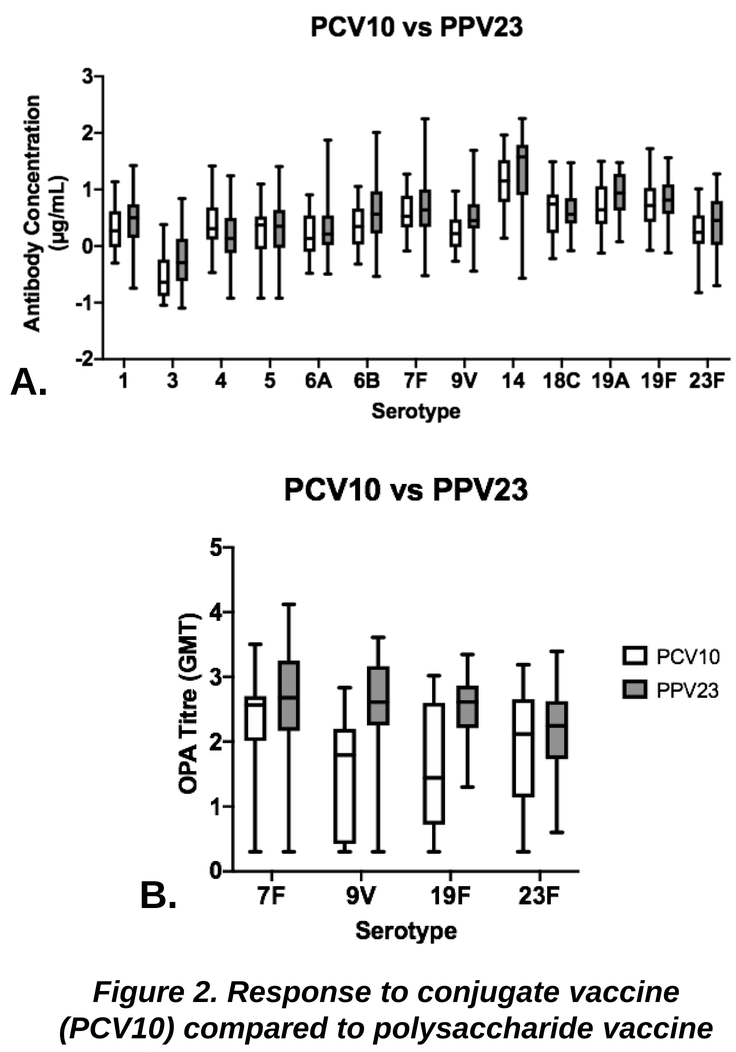

Figure 2. Response to conjugate vaccine (PCV10) compared to polysaccharide vaccine (PPV23) in previously individuals previously exposed to PPV23. *A. Quantitative response as measured using ELISA. B. Functional response as measured using OPA.*

Immune tolerance with previous PPV23 vaccination

- Responses were similar for PPV23 naive and experienced individuals.
- There was no evidence of immune tolerance with repeated polysaccharide vaccination.

Table 1. Participant demographics

	Group 1	Group 2	Group 3	Group 4
n	26	24	36	36
Age (Mean)	47.23 ± 14.49	44.48 ± 14.80	46.64 ± 15.26	45.5 ± 17.96
Gender				
Male	19 (73%)	15 (65%)	25 (69%)	14 (39%)
Female	7 (27%)	8 (35%)	11 (31%)	22 (39%)
Splenectomised	23 (89%)	21 (91%)	33 (92%)	34 (97%)
Trauma	12 (48%)	15 (65%)	11 (31%)	15 (43%)
Haem.	6 (24%)	2 (9%)	8 (22%)	9 (26%)
Haem. Cancer	1 (4%)	1 (4%)	2 (6%)	1 (4%)
Cancer	0 (0%)	0 (0)	1 (3%)	3 (9%)
Other	6 (24%)	5 (22%)	14 (39%)	7 (20%)
Immune Disorder	0 (0%)	1 (3%)	1 (3%)	3 (9%)
Pneumococcal Disease	4 (15%)	4 (17%)	7 (19%)	7 (20%)

Immune Persistence post PPV23

Reassuring immune persistence was seen following previous PPV23 vaccination (at least 3 years prior).

Table 2. Immune persistence with PPV23

No. of individuals previously exposed to PPV23	72
Antibody concentration >1µg/mL to all tested serotypes at first visit	5
OPA geomean titre > 8 to all tested serotypes at first visit	20

Conclusions

Little evidence in this study that conjugate vaccines should be used after primary polysaccharide vaccination in individuals with asplenia. Previous polysaccharide vaccination does not appear to be associated with any long-term hypo-responsiveness.

Acknowledgements

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