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B Part of it NT study: Immunisation for adolescents against two serious communicable diseases with one vaccine

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Author(s)

Helen S. Marshall, MBBS MD MPH FAHMS FPHAA

Clinical Research Director and Professor in Vaccinology

The University of Adelaide and Women's and children's Health Network

James Ward, PhD

Professor and Director, Poche Institute

University of Queensland

Mark McMillan, PhD

Postdoctoral researcher

The University of Adelaide and Women's and Children's Health Network

John Kaldor, PhD

Scientia Professor

Kirby Institute

Ross Andrews, PhD

Consultant Epidemiologist

Queensland Health

Kristine Macartney, RACP PhD

Director, National Centre for Immunisation Research and Surveillance

National Centre for Immunisation Research and Surveillance

Vicki Krause, MD FAFPHM

Director, Communicable Disease Control

NT Government

Peter Richmond, RACP

Director Vaccine Trials Group

Telethon Kids Institute, Western Australia

David Whiley, PhD

Principle Research fellow

University of Queensland

Lynne Giles, PhD

Associate Professor in Biostatistics

The University of Adelaide

Background

Neisseria meningitidis and Neisseria gonorrhoeae share 90% genetic homology. 4CMenB is a multicomponent-protein-based vaccine containing outer membrane proteins found in both bacterial species.

Aim/Methods

The “B-Part-of-It-NT” study aimed to assess the vaccine impact and effectiveness of 4CMenB against gonorrhoea and impact on carriage of N. meningitidis in adolescents in the Northern Territory where rates of gonorrhoea are highest in 15-19 year olds. Oropharyngeal samples and demographic details were collected at baseline and 12 months. Two doses of 4CMenB vaccine were administered to 14-19 year olds enrolled in the study across urban, regional and remote communities. Samples were screened for the presence of N. meningitidis DNA by porA and ctra PCR prior to culture of positives. Whole genome or direct sequencing was performed on N. meningitidis. A case control and cohort analysis is assessing 4CMenB impact on gonorrhoea and logistic regression with imputation to assess impact of 4CMenB on carriage.

Results

Of 2,463 participants enrolled (31% Aboriginal or Torres Strait Islander), N. meningitidis carriage prevalence was 3.5% at baseline and 4.6% at 12 months. At baseline, N. meningitidis carriage prevalence was higher in Aboriginal (9.0% 61/679) compared to non-Aboriginal (1.2% 18/1563) adolescents. Carriage prevalence ranged from 1.5% (21/1421) in Darwin urban, a mostly non-Aboriginal population, up to 27.3% (21/77) in a region of remote Aboriginal communities (27.3%; 21/77). Group B was the most prevalent disease-associated genogroup identified overall (34%; 15/44) and in the remote Aboriginal communities (50%; 8/16) compared to groups A,C,W, and Y combined overall (16% 7/44). Sequencing characterization included: B, porA new, 22,14, BAST1576; C, ST 206 (CC 41/44), porA 19-27,15, BAST1920; cnl, ST-32, porA 19,15, BAST 3177; cnl, porA 18-7,43; NG. ST-198, porA 18,25-15 BAST 4377; NG, ST-35, porA 22-1,14, BAST 257; NG ST-32 porA 19,15 BAST 3177 ;NG, ST-175 porA new, 2-28. Smoking rates were high in remote regions (48-59%). Smoking was a risk factor for carriage OR=9.4 (5.1,17.3).

Conclusions

The lower-than-expected carriage of groups W and Y may indicate the successful early rollout of the MenACWY program for Northern Territorians. The higher carriage prevalence of N. meningitidis in more remote regions may be associated with higher prevalence of smoking.