The 4CMenb Meningococcal Vaccine Induces Antibodies That Can Recognise and Kill *Neisseria Gonorrhoeae*

Eskandari S[1], Semchenko EA[1], Hughes I[3], Slesarenko VA[1], Blakeway LV[1], Kasimov VM[1], O'Sullivan M[2], Thng C[1,2], Seib KL[1]

[1]Institute for Glycomics, Griffith University, Southport, Qld 4215, Australia
[2]Gold Coast Sexual Health, QLD Health, Southport, Qld 4215, Australia
[3] Office for Research Governance and Development, Gold Coast University Hospital, Southport, Qld 4215, Australia

Background:
Gonorrhoea is a global public health concern with ~82 million cases per year and is becoming increasingly difficult to treat due to multi-drug resistant strains of *Neisseria gonorrhoeae* (Ng). If left untreated, infection can lead to severe sequelae such as adverse pregnancy outcomes and infertility. Vaccine development for gonorrhoea has been challenging due to antigenic variability, the lack of a protective immune response following infection and the absence of an appropriate animal model that mimics infection. However, observational studies have shown that people vaccinated with *Neisseria meningitidis* serogroup B vaccines (MeNZB or 4CMenB) have a reduced rate of Ng infection compared to unvaccinated controls. We have conducted an open-label randomised controlled trial, MenGO, to evaluate the efficacy of 4CMenB against Ng infection in gay and bisexual men (GBM).
This study aims to characterise 4CMenB vaccine-induced antibodies that cross-react with Ng in order to understand mechanisms of vaccine protection against gonorrhoea.

Methods:
130 gay and bisexual men were randomised 1:1 to either receive 2-doses of 4CMenB (at baseline and 3 months) or no treatment. Participants then had 3-monthly visits over 24 months for a complete sexual health screen. Blood was also collected at baseline, 3, 6, 12 and 24 months for analysis in ELISA, Western Blot and serum bactericidal activity assays to characterise antibodies that cross-react with Ng whole cells and Ng surface proteins. Data up to 12 months is presented here.

Results:
There are increases in total IgG, IgG1, IgG4 and serum IgA antibodies against the Ng NHBA protein in serum of 4CMenB-vaccinated vs unvaccinated participants. There is also an increase in bactericidal activity in the serum of vaccinated compared to unvaccinated participants at 6-month and 12-month time-point compared to baseline.

Conclusion:
Vaccination with 4CMenB induces antibodies that can recognise and kill Ng, which supports the potential of this vaccine to provide cross-protection against gonorrhoea.

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