Anti-Vi IgG and IgA Persistence following Immunisation with Vi Conjugate and Polysaccharide Vaccines

Lizzy Jones

27\textsuperscript{th} March 2019
Vaccines Against *Salmonella* Typhi

Oxford typhoid fever

Controlled Human Infection Model (CHIM)

*Typhoid Diagnosis* defined as fever ≥38°C for >12 hours or positive blood culture
Vi-vaccination reduces Typhoid Fever cases by >50%

Jin et al., Lancet (2017)
Higher anti-Vi IgG, IgG2 and IgA titres are associated with a decreased risk of typhoid fever diagnosis.

- OR: 0.35 [0.21, 0.59] (p<0.0001)
- OR: 0.34 [0.13, 0.84] (p=0.02)
- OR: 0.36 [0.15, 0.86] (p=0.02)
High anti-Vi IgG and IgA titres persist 13 months post Vi-vaccination
(no significant difference between Vi-TT and Vi-PS)
High anti-Vi IgG and IgA titres persist 13 months post Vi-vaccination
Persistence of antibody effector functions in response to Vi vaccination

**Antibody-dependent cellular phagocytosis**
- Serum antibody
- Antigen-coated fluorescent beads
- THP-1 monocytes

**Antibody-dependent neutrophil phagocytosis**
- ROS
- Human neutrophils

**Antibody-dependent complement deposition**
- Antigen-coated fluorescent beads
- Guinean pig complement
- C1r, C1s, C6, C3, C4, C5

**Antibody-dependent NK cell activation**
- Plate bound antigen
- Cytotoxic granule release
- IFNγ and MIP1β
- Primary human NK cell

Infographic courtesy of Bonnie Gunn, Ragon Institute.
Long lasting functional antibodies produced in response to Vi vaccination

Antibody dependent Cellular Phagocytosis

Antibody Dependent Neutrophil Phagocytosis

Antibody Dependent Complement Deposition

Antibody Dependent NK cell Degranulation

Same pattern of NK cell activation when assessing IFNg, and CD107a release

Graphs courtesy of Celina Jin and Jenny Hill
Acknowledgements

Volunteers

OVG Typhoid Study Team
Vaccination with Vi-TT induces higher levels of functional antibody.
Exposure to S. Typhi 1 month after does result in a boost in Vi antibody titres

Comparison of antibody persistence in vaccinated and exposed individuals

Anti-Vi IgG responses to Vi-TCV in a controlled human infection model
One month post-vaccination, Fc-mediated functional responses are significantly higher in Vi-TT than Vi-PS vaccinees.
Vi-TT vaccination increases NK cell degranulation one month post-vaccination in comparison with Vi-PS.