National Immunisation Workshop
8th & 9th September 2016

Alison Eddy
Midwifery Advisor
New Zealand College of Midwives

Maternal immunisation
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“Innovative approaches to maternal immunisation have the potential to decrease serious morbidity and mortality not only in the mother, but also the fetus, neonate and young infant who are not yet immunologically able to respond to most vaccines. We are only beginning to unlock the potential of using vaccines in this way”

• Strengthening maternal immunisation to improve the health of mothers and infants. Abramson A, Mason E. Lancet, June 29 2016
How does it work?

IgG transplacental transfer

Which vaccines?

• Tetanus
• Yellow fever
• Influenza in pregnant women is now recognised as a substantial problem, and an increasing number of countries are incorporating the influenza vaccine into their immunisation programme
• Acellular pertussis immunisation of pregnant women has increasingly been adopted to reduce infant mortality and morbidity

• WHO. Maternal and neonatal tetanus (MNT) elimination Geneva WHO 2016
• Vaccines and vaccination against yellow fever. WHO position paper – June 2013
• Strengthening maternal immunisation to improve the health of mothers and infants. Abramson A, Mason E. Lancet, June 29 2016
• Vaccines against influenza. WHO position paper-November 2012
Enhanced natural killer-cell and T-cell responses to influenza A virus during pregnancy


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Pregnant women experience increased morbidity and mortality after influenza infection, for reasons that are not understood. Although some data suggest that some natural immune responses are suppressed during pregnancy, influenza-specific responses have not been previously evaluated. This study analyzed the responses of 21 women that were pregnant versus 29 of those that were not immediately before inactivated influenza vaccination, 7 d after vaccination, and 6 wk postpartum.

Findings: Robust cellular immune responses to influenza during pregnancy could drive pulmonary inflammation, explaining increased morbidity and mortality.
Vaccines currently in trial for maternal use

• Group b Streptococcus
• Respiratory syncitial virus
• CMV
Maternal influenza vaccination

Source: MOH / NIR 2015
Maternal pertussis vaccination

Source: MOH / NIR 2015
I've learned that it takes years to build up trust, and it only takes suspicion, not proof, to destroy it.

- me
Having vaccines that have been well studied in pregnant women is fundamental for creating a strong maternal immunisation programme.

- Strengthening maternal immunisation to improve the health of mothers and infants. Abramson A, Mason E. Lancet, June 29 2016
Influvac

- Use in pregnancy Category B2. No relevant animal data available.
- No convincing evidence of risk to the foetus from immunisation of pregnant women.
- Possible risks of clinical influenza infection should be weighed against the possible risks of vaccination in high risk pregnancies.
- Pregnant women, particularly during the second and third trimester, are at increased risk of influenza associated complications. It is recommended that all women who will be in the second or third trimester of pregnancy during the influenza season be vaccinated in advance, so they are protected during that season.
Boostrix

- Data from prospective observational study BOOSTRIX administered during the third trimester (793 pregnancy outcomes) and post-marketing surveillance where pregnant women were exposed to BOOSTRIX®-IPV or to BOOSTRIX® indicate no vaccine related adverse effect on pregnancy or on the health of the foetus/newborn child.
- The use of BOOSTRIX®-IPV may be considered during the third trimester of pregnancy.
- Human data from prospective clinical studies on the use of BOOSTRIX®-IPV during the first and second trimester of pregnancy are not available.
- Limited data indicate that maternal antibodies may reduce the magnitude of the immune response to some vaccines in infants born from mothers vaccinated with BOOSTRIX®-IPV during pregnancy. The clinical relevance of this observation is unknown.
- Non-clinical data reveal no specific hazard for humans based on conventional studies of embryo-foetal development in rats and rabbits, and also of parturition and postnatal toxicity in rats (up to the end of the lactation period).
- BOOSTRIX®-IPV may be used during pregnancy when the possible advantages outweigh the possible risks for the fetus.
Assessed the effectiveness of maternal pertussis vaccine and the overall effect of the vaccine programme in preventing pertussis in infants.

**Findings:** Fall in confirmed cases and hospital admissions in infants younger than 3 months following implementation of maternal vaccination programme.
Assessed the persistence of pertussis antibodies until primary vaccination in 37 infants whose mothers received Tdap (tetanus, diphtheria, acellular pertussis) vaccine between 21 to 38 weeks gestation of pregnancy. Antibody levels were assessed between the first and second month of life, and estimated at 2 months of age.

**Findings:** Infants presented a decline in anti-PT IgG between peripartum and follow-up levels, 52.7 (95% CI 34.7–80.2) versus 7.5 (95% CI 4.2–13.3) at 2 months of age (p < 0.001). The median half-life of maternal antibodies was 47 days. More than half (51.4%) the infants presented detectable anti-PT IgG before the start of primary infant vaccination. Maternal pertussis vaccination is associated with higher levels of pertussis antibodies at birth.
340 pregnant women randomised to receive either inactivated influenza vaccine (influenza-vaccine group) or the 23-valent pneumococcal polysaccharide vaccine (control group).

**Findings:** Among infants of mothers who received influenza vaccine, there were fewer cases of laboratory-confirmed influenza than among infants in the control group. Among the mothers, there was a reduction in the rate of respiratory illness with fever of 36%.
Linked perinatal and maternal vaccination records for 58,008 births between April 2012 and December 2013.

**Findings:** Mothers who received seasonal TIV during pregnancy were significantly less likely to experience stillbirth compared with unvaccinated mothers. These results support the safety of seasonal influenza immunization during pregnancy and suggest a protective effect.
The answer is 17 years, what is the question: understanding time lags in translational research

Findings: Literature review describing and quantifying time lags in the health research translation process.

The current state of knowledge of time lags is of limited use to those responsible for R&D and knowledge transfer who face difficulties in knowing what they should or can do to reduce time lags.
Reviewed 45 studies from a range of countries (USA, France, Switzerland, Canada, India, Hong Kong, Australia, Turkey, Netherlands)

Conclusions: Influenza vaccination uptake among pregnant women is suboptimal and HCPs rarely recommend it. Positive vaccination recommendations from HCPs as well as direct access to the vaccine would likely substantially improve vaccination acceptance.
Discredited vaccine advice endangers babies

One mum missed the first week of her baby’s life after failing to get a flu jab. Now, there are concerns that some antenatal teachers and midwives have been giving discredited anti-immunisation advice to expecting mothers.

MARIKA HILL
Last updated 16:13, May 24 2015
‘You must be a worthy vessel. No coffee or tea though, no alcohol. Studies have been done.’

Margaret Atwood, The Handmaid’s Tale
• Taking paracetamol during pregnancy 'may raise the risk of a child developing ADHD'
• Paracetamol could increase the risk of hyperactivity disorders by a third
• The risk is higher for women who take the painkiller for a long time
• It can act as a hormone disruptor, interfering with brain development
• About half of women take painkillers during pregnancy
Encouraging sources of information

Reference: Linda Hill. *Factors Influencing Women’s Decisions about Having the Pertussis-Containing Vaccine during Pregnancy*
A thesis submitted for the degree of Master of Health Sciences (Nursing) at the University of Otago, Christchurch, New Zealand February 2015
Discouraging sources of information

Reference: Linda Hill. *Factors Influencing Women’s Decisions about Having the Pertussis-Containing Vaccine during Pregnancy* A thesis submitted for the degree of Master of Health Sciences (Nursing) at the University of Otago, Christchurch New Zealand February 2015
Partnership

- negotiation
- equality
- shared responsibility
- empowerment
- informed choice
- & consent

Midwife

father, husband, partner, family

Woman