Evidence Assessment: Summary of a Systematic Review

Who is this summary for?

For Doctors and Health Personel, Administrators and Managers of health facilities, Community Health Workers and the partners involved in mother and child health.

Vaccines for women for preventing neonatal tetanus

Key findings

- A protective effect against deaths caused by tetanus was observed among the new-borns from mothers who received at least two doses of the tetanus toxoid vaccine when compared with new-borns from mothers who were immunised with influenza vaccine.
- Cases of tetanus were less frequent among new-borns from women who received at least one dose of tetanus toxoid.
- The women experienced more pain with the vaccine injection than with the placebo.

Background

Neonatal tetanus is a major cause of childhood mortality in developing countries. In 1997 an estimated 277,376 neonatal deaths were attributed to tetanus, corresponding to a global mortality rate of 2.1 per 1000 live births. More recently, because of successful vaccination programmes and application of single-dose antenatal tetanus immunisation prevention strategies, the last available World Health Organization (WHO) estimate for deaths caused by neonatal tetanus (year 2013), was 49,000.

Tetanus in new-born babies is an infection causing rigidity, muscle spasm and often death. It is quite common in low-income countries, as a result of insufficient protection being passed from the mother to her baby during pregnancy, and infection of the umbilical cord if it is cut with contaminated instruments.

Question

What is the effectiveness of vaccination administered to women of reproductive age, or pregnant women, in preventing cases of neonatal tetanus?

Vaccines for women for preventing neonatal tetanus in Cameroon. The incidence of neonatal tetanus was less than1 case / 1000 live births in 2015. Coverage of tetanus vaccine was 62% in 2015 with 118 cases of notified maternal or neonatal tetanus. Improved immunization coverage will reduce the number of cases and eliminate tetanus in Cameroon.

Table 1: Summary of the systematic review		
	What the review authors searched for	**What the review authors found**
Studies	Randomised, quasi-randomised, or cluster-randomised trials	Three studies (two cluster randomized controlled trials and one randomised trial) met the inclusion criteria
Participants	Pregnant women or women of reproductive age irrespective of immune status.	Pregnant women or women of reproductive age irrespective of immune status.
Interventions	Vaccines containing tetanus toxoid compared with placebo, other control vaccines or no intervention.	One study assessed the effects of aluminium phosphate adsorbed tetanus toxoid (10LF) against polyvalent influenza vaccine. One other study assessed the effects of adsorbed tetanus-diphtheria toxoid against cholera toxoid. A third trial compared the administration of Tetanus Diphtheria acellular Pertussis vaccine (Tdap) with saline placebo.
Controls	Placebo, control vaccines or no intervention	Influenza vaccine, placebo, cholera toxoid.
Outcomes	**Primary outcomes** • Neonatal tetanus cases. • Neonatal mortality (deaths from neonatal tetanus; all causes). • Serious harms. This includes outcomes related to the course of pregnancy (spontaneous abortion, fetal death, stillbirth, preterm birth, maternal death), to neonatal outcomes (congenital malformations, neonatal death) and to severe adverse events (e.g. neurological harms). **Secondary outcomes** • Adverse effects, classified as systemic (systemic adverse effects include cases of fever and more generalised signs). • Adverse effects, classified as local (local adverse effects include duration, soreness and redness at the site of inoculation).	• Cases of neonatal tetanus • Deaths from neonatal tetanus • Non-tetanus deaths • Neonatal mortality and mortality on days four to 14 from birth • Local and systemic reactions within seven days after immunisation • Pregnancy outcomes, • Serious adverse events.
Date of the most recent search: 31 January 2015.		
Limitations: This is a high quality systematic review**, AMSTAR =11/11**		
Citation: Demicheli V, Barale A, Rivetti A. Vaccines for women for preventing neonatal tetanus. Cochrane Database of Systematic Reviews 2015, Issue 7. Art. No.: CD002959. DOI: 10.1002/14651858.CD002959.pub4.		

Table 2: Summary of findings

Tetanus toxoid versus influenza vaccine for women to prevent neonatal tetanus			
Patient or population: women aged between 13 and 45 years. **Settings:** rural community **Intervention:** tetanus toxoid versus influenza vaccine			
Outcomes	**Relative effect (95% CI)**	**No of Participants (studies)**	**Quality of the evidence (GRADE)**
Neonatal tetanus deaths - 1 dose **Follow-up: 30 days**	0.57 [0.26-1.24]	494 (1)	Low
Neonatal tetanus deaths - 2 or 3 doses **Follow-up: 30 days**	0.02 [0-0.3]	688 (1)	Moderate
All causes of deaths 1 dose **Follow-up: 30 days**	1.08 [0.65-1.79]	491 (1)	Low
All causes of deaths 2 or 3 doses **Follow-up: 30 days**	0.31 [0.17-0.55]	688 (1)	Moderate
Neonatal tetanus cases - Any dose **Follow-up: 30 days**	0.2 [0.1-0.4]	1182 (1)	Moderate

Applicability

The trials were conducted in USA (2) and Bangladesh (1). These interventions may be applied in other low resources settings such as Cameroon.

Conclusions

There is very low to moderate quality evidence indicating that tetanus vaccine administered to women of reproductive age and pregnant women can reduce the number of cases of tetanus and the number of deaths from tetanus. The tetanus vaccine is more painful than placebo.

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