

Neonatal Tetanus in Malaysia

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INTRODUCTION

Neonatal Tetanus is a severe disease with high fatality. It should no longer be present in a country with the development status of Malaysia. However, sporadic cases still occur and the disease has not been eradicated. This editorial summarises the disease pattern, incidence and suggests reasons for the continued persistence of the condition locally.

Disease Pattern

Tetanus is an acute disease caused by a highly potent neurotoxin (tetanospasmin) produced by *Clostridium tetani*. This exotoxin acts at the myoneural junction of skeletal muscle and on neuronal membranes in the spinal cord blocking inhibitory pulses to motor neurons. It is characterised by muscular rigidity with superimposed agonising contractions. The bacillus grows anaerobically at the site of wounds. Tetanus spores are present in soil and, for adults and children, may be introduced into the body during injury through puncture wounds, burns or trivial unnoticed wounds. Tetanus is not spread from person to person. The incubation period is between two days and two months, averaging ten days, and most cases occur within 14 days. Shorter incubation periods have been associated with more heavily contaminated wounds, more severe disease and a worse prognosis. Death results from respiratory failure, hypotension or cardiac arrhythmias. Case-fatality rates are high even with good intensive care^{1,2,3,4}.

Neonatal tetanus, due to infection of the baby's umbilical stump, is an important cause of death in many developing countries where women are not appropriately immunised against tetanus and deliveries are conducted in a non sterile manner (unsafe deliveries)⁵. Tetanus in children and adults following injuries constitutes a smaller public health problem. The case fatality rates for neonatal tetanus with good intensive care range from 10-20%^{3,4,5,6}. Those of us who have been working with children for more than 25 years will still remember the agonising state of neonates with neonatal tetanus and the frequent failure we had in salvaging them.

Tetanus Toxoid Vaccine and Immunity

There is insufficient data to answer questions about natural immunity to tetanus. There is no clear data showing a rise in natural immunity with age. It is postulated that there is no immunity induced by tetanus infection². Immunisation protects by stimulating the production of antitoxin, which protects against the toxin produced by the organism. The immunogen is prepared by treating a cell free preparation of toxin with formaldehyde and thereby converting it into the innocuous tetanus toxoid. It is usually adsorbed on to an

adjuvant, either aluminium phosphate or aluminium hydroxide, to increase its immunogenicity. *Bordetella pertussis* vaccine also acts as an effective adjuvant². Tetanus toxoid is stable and can stand room temperature for months^{2,4}. However, tetanus vaccines as part of DPT should be stored at 2-8°C and should not be frozen or exposed to light^{3,4}. The dose is 0.5 mL given intramuscularly. As part of primary childhood immunisation, tetanus vaccines should not be given as a monocomponent vaccine but in combination with diphtheria (DT) and/or pertussis (DPT). Mothers are immunised in pregnancy with tetanus toxoid as it is shown that tetanus antitoxin is transferred from the immunised mother to the foetus, thus providing transient protection to the newborn infant from tetanus. It is vital that mothers, without primary immunisation in childhood (see below), are immunised as early as possible in the pregnancy to ensure an adequate interval between the second dose and delivery².

Incidence

Neonatal tetanus is a notifiable disease in Malaysia. The figure shows the number of reported cases of neonatal tetanus since 1975^{7,8}. Tetanus toxoid (ATT) immunisation for pregnant mothers was implemented in 1976. Coverage rates in pregnancy rose until 1990 where they have remained at between 80-85%. The effect of this has been a dramatic reduction in the number and incidence of neonatal tetanus. In the ten year period from 1989-1998 there were 32 deaths out of 180 reported cases giving a case fatality rate of 17.8%. The case fatality rate has decreased in the 2000-2006 period to 2.6% (2 deaths out of 78 cases)⁷. It is important to note that the numbers have become so low that it is no longer meaningful to calculate incidence rates. In addition there has been much inter year fluctuation. An additional factor for the decline in neonatal tetanus is the primary immunisation programme for children that has been in place since the 1970s – three doses of DPT at 2,3 and 5 months followed by a DPT booster at 18 months, a DT booster at school entry and a tetanus booster at Form 3. Many of these children immunised have become child bearing adults and immunity lasts for at least 20 years after such a schedule that has 5 doses of tetanus toxoid².

Global Perspective

Neonatal tetanus was recognised as a major public health problem in the late 1980s where it was estimated that more than 750,000 neonates died of neonatal tetanus. In 1989, the 42nd World Health Assembly called for elimination of neonatal tetanus by 1995¹⁰. The target date for elimination was however not met due to slow implementation and was postponed to 2000. As of 2008, there still remain 46

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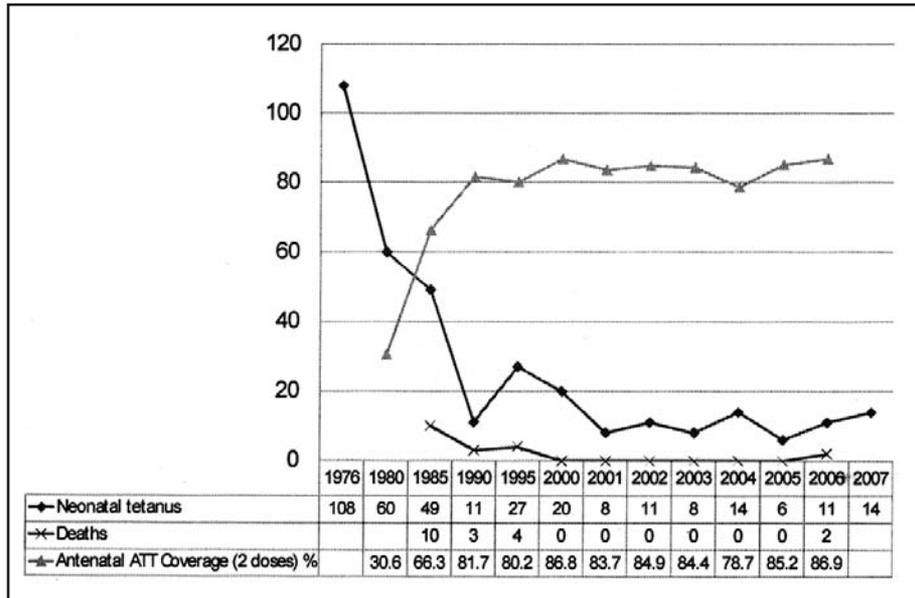


Fig. 1: Reported Cases and Deaths of Neonatal Tetanus with Antenatal Coverage of Tetanus Toxoid in Malaysia, 1976-2007

countries to eliminate neonatal tetanus (most in Africa). The World Health Organization estimates the international burden of newborn deaths due to neonatal tetanus at 128,000 in 2004, the latest year for which estimates are available. This accounts for 3.4% of all under 5 deaths in the world for 2004¹¹. In addition, for 2004, an estimated 40 million pregnant women were still in need of immunization against birth-associated tetanus, and about 27 million children did not complete their primary tetanus immunization series¹².

Elimination of Neonatal Tetanus in Malaysia

It must be noted that, despite the existing healthcare initiatives, neonatal tetanus has not been eliminated in Malaysia and this is cause for concern. Part of the reason for this lies with the delivery of health care to immigrants. More than 90% of all cases are reported from Sabah and the majority of these from immigrants, as highlighted by a case series published in this issue of the journal⁹. The Ministry of Health has planned measures to eliminate neonatal tetanus¹³. However, these need to be made effective on the ground. Neonatal tetanus can be eliminated in Malaysia if we increase the antenatal tetanus toxoid immunisation rates to past 95% from its current 85%. Populations with poorest antenatal tetanus toxoid cover are immigrants, indigenous peoples and some pockets of rural and urban poor. Currently many illegal immigrants are not provided basic health care by our health service. They are also reluctant to come forward as they are fearful of being deported. It is important to note that treating a child with neonatal tetanus is much more expensive than providing tetanus toxoid immunisation to a community. On humanitarian grounds antenatal care must be provided regardless of immigration status to all antenatal mothers, without fear of legal action. This is the only meaningful way to eliminate this horrific disease in neonates locally.

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