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Neonatal Tetanus in St. Mary's Hospital Lacor Intensive Care Unit: A Case Report

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Abstract

Tetanus is a life-threatening disease caused by the anaerobic spore-forming bacterium, *Clostridium tetani,* which produces a potent neurotoxin responsible for symptoms upon entering a susceptible host. Herein, we present a 5-day-old male neonate, delivered by spontaneous vaginal delivery who presented with a three-day history of provoked episodes of spasms associated with refusal to breastfeed and excessive crying. He was born to an 18-year old first-time mother who did not receive tetanus toxoid containing vaccines (TTCV) during her antenatal care visits. He had active spasms and his oxygen saturation was at 98% on 1 litre of oxygen/min via nasal prongs. The umbilical cord stump had purulent discharge. He was admitted to intensive care unit, initiated on phenobarbital, metronidazole and continued oxygen therapy. He didn't receive TTCV, tetanus immunoglobulin and eventually expired on day 7 of life. Maternal TTCV immunization, skilled birth attendance and proper umbilical stump care are key in the prevention of neonatal tetanus.

Keywords: Neonatal tetanus; Intensive Care Unit (ICU); Tetanus immunoglobulin; Tetanus toxoid; Resource-limited settings

Introduction

Tetanus is a life-threatening disease caused by the anaerobic spore-forming bacterium, *Clostridium tetani*, which produces a potent neurotoxin responsible for symptoms upon gaining entry through a skin breach in a susceptible host, multiplying under suitable anaerobic environment, hence releasing tetanus toxin (tetanospasmin) [1,2]. Tetanus presents in four main forms; (1) Local tetanus, (2) Cephalic tetanus and (3) Generalised tetanus in adults and (4) Neonatal tetanus [3].

Neonatal tetanus is almost always fatal [4,5]. Predisposition to neonatal tetanus includes umbilical stump sepsis, use of unsterile equipment to cut the cord, home delivery, application of cow dung and other unsafe traditional practices [6,7]. Failure to suckle breast milk and excessive cry are the early and yet non-specific manifestation of neonatal tetanus. However, trismus, risus sardonicus and opisthotonus are characteristic features of generalized neonatal tetanus [5]. Neonatal tetanus can be prevented possibly by administering vaccines to pregnant or non-pregnant women, or both, with tetanus toxoid, and through safe clean delivery services [8].

The World Health Organization (WHO) recommended schedules for tetanus toxoid containing vaccines (TTCV) includes six doses: a three-dose primary infant series and three booster doses given at ages 12-23 months, 4-7 years, and 9-15 years [5]. Pregnant women and their new-born infants are protected from tetanus if the mother received six TTCV doses during childhood or five doses if a catch-up vaccination schedule was initiated after 1 year of age [9]. However, new-born infants may develop the disease when their mothers do not have sufficient circulating antibodies to passively protect them [8]. Mortality from neonatal tetanus is high when symptoms start in those less than 7 days old [10,11] and are related to autonomic nervous system dysfunction (labile hypertension and unstable heart rate) and spasm of respiratory muscles leading to respiratory failure [5]. Treatment of neonatal tetanus requires administration of intramuscular 0.5 ml of TTCV and 500 IU of tetanus immunoglobulin on separate thighs and Crystalline Penicillin given for 10 days. An intravenous infusion of diazepam at a dose of 5 mg/kg/d and is increased depending on response [11]. Herein we present a fatal case of neonatal tetanus in a child born to a first-time mother who did not receive a single dose of TTCV vaccine during antenatal care (ANC).

Case Description

Clinical history

A 5-day-old male neonate was delivered by spontaneous vertex delivery to a peasant mother in a lower unit health facility (health centre III). The baby cried immediately upon delivery and weighed 3.0 kg. He presented with a 3-day history of high-grade fever, refusal to breastfeed, excessive crying and difficulty in breathing. He had episodic provoked spasms (Figure 1). His mother, an 18-year-old, para 1+0 attended ANC three (3) times and was treated for malaria at 24 weeks of gestation. However, she did not receive the routine TTCV vaccines during all her ANC visits.

Clinical examinations

The baby was sick, on supplemental oxygen via nasal prongs and saturating at 98% on 1 litre of oxygen/min. His axillary temperature was 38.2°C, in respiratory distress, respiring at a rate of 72 breaths per min, with bilateral equal breath sounds. Pulse rate was at 121 bpm with normal heart sounds S1 and S2. The umbilical cord stump had purulent discharge. The abdomen was of normal fullness, with a tense abdominal muscle. The rectum had normal stool.

Management

The neonate was admitted to intensive care unit, and initiated on phenobarbital, metronidazole and oxygen therapy. He had no administration of TTCV and tetanus immunoglobulin due to non-availability and eventually expired on day 7 of life.

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Figure 1: Picture of the neonate in ICU having episodes of spasms.

Discussion

The WHO aimed at global elimination of neonatal tetanus. The case-fatality rate of neonatal tetanus without treatment approaches 100%, though with intensive care this can be decreased to 10-20%. The WHO estimated that there were 34,000 neonatal tetanus deaths worldwide in 2015, St. Mary's hospital Lacor recorded mortality at 78% in 2014 [12]. The present case with typical features of neonatal tetanus [3]. His umbilical stump was septic, discharging pus, which was most likely the entry route of the deadly *C. tetani* [6,7]. The symptom onset was between the first 24-48 hours of birth. A short incubation period is associated with a poorer prognosis in both neonatal and adult tetanus cases [10,11]. Immediate treatment for tetanus upon diagnosis was instituted following the St. Mary's Hospital Lacor Neonatal Tetanus treatment protocol which, included patient stabilization, entry site debridement, rectal diazepam 1.25 mg, 4 hourly and whenever necessary with increasing frequency of spasms, intravenous metronidazole 15 mg 6 hourly, tetanus immunoglobulin, oxygen and nasogastric feeding. However, he did not receive tetanus immunoglobulin, which is known to unbound tetanospasmin, due to its unavailability. This protocol varied slightly from a protocol used in an Indian hospital by not including TTCV and crystalline penicillin to its regimen [11,13]. On the 3rd day of stay in the ICU, the neonate's condition worsened with severe respiratory distress from respiratory muscle spasms, which is an indicator of autonomic system failure. Phenobarbital was administered with the intent of halting breakthrough spasms, but complete suppression of spasms wasn't attained [5]. Pregnant mothers routinely receive TTCV during antenatal care visits to prevent neonatal tetanus. Unfortunately, this mother didn't receive any dose of TTCV in all her four ANC visits because of the unavailability of the vaccine in the facility where she had been attending ANC from, thus the new-born baby wasn't protected from this deadly disease [8].

Conclusion

Umbilical stump sepsis in non-passively immunized neonates poses a great risk to neonatal tetanus. Management of neonatal tetanus still poses a great challenge in resource-limited settings where some health facilities lack tetanus toxoid containing vaccines, management that may require ventilator support and inaccessibility of tetanus immunoglobulin.

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References

1. Bonomo RA (2000) Multiple antibiotic-resistant bacteria in long-term-care facilities: An emerging problem in the practice of infectious diseases. Clin Infect Dis 31: 1414-1422.
2. Moura S, Martins MD (2019) Determinants of tetanus vaccination among adult immigrants: Findings from the portuguese national health survey 2014. Int J Environ Res Public Health 16: 1619.
3. Ergonul O, Egeli D, Kahyaoglu B, Bahar M, Etienne M, et al. (2016) An unexpected tetanus case. Lancet Infect Dis 16: 746-752.
4. Ibinda F, Bauni E, Kariuki SM, Fegan G, Lewa J, et al. (2015) Incidence and risk factors for neonatal tetanus in admissions to kilifi county hospital: Kenya. PLoS One 10.
5. Mumford JA, Jessett DM, Rollinson EA, Hannant D, Draper ME (1994) Duration of protective efficacy of equine influenza immunostimulating complex/tetanus vaccines. Veterin Rec 134: 158-162.
6. Onalo R, Ishiaku HM, Ogala WN (2011) Prevalence and outcome of neonatal tetanus in Zaria: Northwestern Nigeria. J Infect Dev Ctries 5: 255-259.
7. Chang SC, Wang CL (2010) Neonatal tetanus after home delivery: Report of one case. Pediatr Neonatol 51: 182-185.
8. Demicheli V, Barale A, Rivetti A (2015) Vaccines for women for preventing neonatal tetanus. Cochrane Database Syst Rev 7.
9. Khan R, Vandelaer J, Yakubu A, Raza AA, Zulu F (2015) Maternal and neonatal tetanus elimination: From protecting women and newborns to protecting all. Int J Womens Health 7: 171-180.
10. Thwaites CL, Beeching NJ, Newton CR (2015) Maternal and neonatal tetanus. Lancet 362-370.
11. Rai R, Singh DK (2012) Neonatal tetanus: A continuing challenge. Ind J Pediatr 79: 1648-1650.
12. Dünser MW, Towey RM, Amito J, Mer M (2017) Intensive care medicine in rural sub-Saharan Africa. Anaesthesia 72: 181-189.
13. Rodrigo C, Fernando D, Rajapakse S (2014) Pharmacological management of tetanus: An evidence-based review. Crit Care p. 18.