

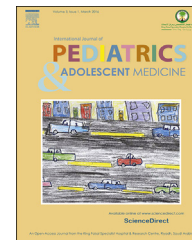
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Original Research Article

Epidemiological and clinical aspects of neonatal tetanus from a tertiary care hospital

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KEYWORDS

Tetanus;
Neonate;
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Abstract Objectives: To study the epidemiology, clinical presentation and outcome of all patients diagnosed with neonatal tetanus and to provide a recommendation for maternal and neonatal tetanus elimination.

Study design: Retrospective study of all cases of neonatal tetanus admitted from 1991 to 2013.
Place: Neonatal intensive care unit, King Fahad Central Hospital, Jazan, southwest Saudi Arabia.

Results: Thirty patients were diagnosed with neonatal tetanus over 22 years. Eighteen (60%) of the patients were born to Saudi mothers, and 12 (40%) were born to non-Saudi mothers. Twenty-seven (90%) deliveries occurred at home. Most of the mothers lived in the mountainous zone of the region. Two (10%) of the mothers had had only a single dose of the tetanus toxoid; the status of the remaining pregnant women was unknown or unimmunized before or during conception. In 18 out of the 30 patients (60%), the umbilical cord was severed using household knife, razor blade or plain scissors. Most of the patients presented with muscle spasms (96.7%), refusal to eat and abnormal posture. Twenty-nine (96.7%) of the patients were intubated and receiving mechanical ventilation. Six (20%) of the patients died.

Conclusion: It is essential to begin campaigns or integrate complete maternal tetanus toxoid immunization at primary health centers (PHC) during antenatal care. Immunization needs to be arranged so pregnant women can be educated regarding the importance of ANC and the risks of unhygienic home delivery, and immunization should be addressed with adequate

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information. Pregnant women and those of childbearing age in mountainous areas should be the first targets for these activities.

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1. Introduction

Neonatal tetanus (NT) is a potentially life threatening disease that is still a health problem in many developing countries. In 2010 and 2013, it was estimated that 58,000 and 49,000 deaths, respectively, occurred from NT worldwide [1,2]. The disease is caused by tetanospasmin, a neurotoxin liberated by anaerobic, spore forming, gram-positive *Clostridium tetani*. The organism contaminates the umbilical cord or its stump following the use of unhygienic instruments or materials during or after delivery [2]. NT is a preventable disease [3]. Maternal tetanus toxoid immunization is the primary prevention. Neonates receive passive immunity from their vaccinated mothers. In addition, delivery in healthcare centers, avoiding unhygienic childbirth practices and some social taboos and perhaps providing sterile instruments for mothers who elect to have home delivery are important preventive measures [3,4].

The diagnosis of NT is clinical. For surveillance purposes, a confirmed case is defined as any neonate with a normal ability to suck and cry during the first two days of life but who no longer sucks normally between 3 and 28 days and becomes stiff or has spasms [5].

Except for one report of tetanus in adult patients, there are no published data on NT from Saudi Arabia. However, over the last five years, 2009–2013, the mean number of cases reported to the World Health Organization (WHO) was 10.4, with a range of 4–14 patients [5,6]. This report reviews the clinical aspects and outcomes of NT cases treated in our institution over the last 22 years. The objective is to draw attention to this preventable disease with the hope of collecting more epidemiologic data and developing a national plan for eliminating NT. This study was approved by the KFCH research ethics committee.

2. Methods and materials

This is a retrospective study of all patients who were admitted to the Neonatal Intensive Care Unit (NICU) at KFCH, Jazan, Saudi Arabia. The NICU is a 25-bed unit and is the major unit that provides critical care in this province. All suspected NT patients are referred from peripheral hospitals to the NICU at this institution. Babies were included if they were younger than 28 days of age as per the definition of confirmed NT by the WHO. The study covered the period between January 1991 and December 2013.

All medical records of patients with a diagnosis of NT were reviewed to collect information about socio-demographic characteristics including gestational age, birth weight, sex, nationality, area of residence, antenatal care of the mother and immunization against tetanus,

location of delivery, attendance of the birth by medical or paramedical staff and the instruments used to cut the umbilical cord. The clinical aspects of the patients were obtained upon admission, including the signs and symptoms on presentation and the management provided. Management included mechanical ventilation and its duration and the medications used for paralysis, sedation and controlling convulsions. The outcomes (either death or discharge) and the neurological examination results for the latter group were also recorded. Non-parametric calculations were used. The study was approved by the research and ethics committee of this institution.

3. Results

A total of 30 cases of NT were admitted to the NICU of KFCH over a period of 23 years. A total of 21 (70%) cases were recorded in the first 10 years of the study (1991–2000), with 1–4 cases per year and an average incidence of 0.47 cases per year. A frequency of zero-two cases per year and an average tetanus incidence of 0.19 per year were observed in the subsequent 13 years of the study. The highest number – four patients – was recorded in 1994. The socio-demographic characteristics of these patients and their mothers are shown in Table 1. Eighteen (60%) of

Table 1 Socio-demographic characteristics of mothers of babies with neonatal tetanus.

Parameter	Number	%
Full-term pregnancy	28	93.3
Preterm	2	6.7
Saudi	18	60
Non-Saudi	12	40
Residence in mountains	23	76.7
Other areas	7	23.3
Antenatal care	4	13.3
No antenatal care	26	86.7
No Tetanus toxoid	27	90
TT, one dose	3	10
TT2+	0	0
Home delivery	27	90
Healthcare center	3	10
Attended ^a	2	6.7
Not attended	13	43.3
Not documented	15	50
Home-instruments used to cut umbilical cord	18	60
Not documented	12	40

^a Labor is attended trained healthcare staff.

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