

Case Report

Neonatal Tetanus: About 4 Cases

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Abstract

Neonatal tetanus is a disease caused by toxoid produced by *Clostridium tetani*, which is rare in newborns; it is an unresolved medical problem in developing countries. The elimination of neonatal tetanus is one of the main objectives pursued by World Health Organization throughout the world. In Morocco; despite the certification of tetanus's elimination; it still rages, with still 4 cases in 2016 in our unit.

We report 4 cases collected in the neonatal intensive care unit, in Mohamed VI University Hospital in Marrakech, during the year 2016.

Neonatal tetanus accounted for 0.68% of all admissions. Pregnancy was not monitored in all 4 cases. Only one woman received 2 doses spaced of tetanus vaccine. The delivery occurred at home in 3 of the cases with application of "Khôl" at the level of the umbilicus. The mean age of admission was 12.5 days. A Dakar score was noted ≥ 4 in 3 cases and is classified as stage III according to the Mollaret classification. The treatment was essentially palliative: it was based on sedation and artificial ventilation. There was mortality in 3 cases.

Tetanus remains a problem in Morocco, despite the progress made, it is necessary to review the eradication strategy. Currently the treatment is essentially preventive, based on vaccination, as well as health education and improvement of hygienic conditions.

INTRODUCTION

Neonatal tetanus is a poisoning caused by *Clostridium tetani*, rare in newborns. It is more likely to occur in low and middle income countries especially in places such as urban slums and rural areas; in those places unhygienic deliveries at home are common, and coverage of antenatal care services and maternal tetanus toxoid immunization are usually inadequate.

In Morocco; despite the certification of tetanus's elimination; it still rages, with still 4 cases in 2016 in our unit. We identified the global, regional, and national levels and trends of mortality from neonatal tetanus.

We report 4 cases, admitted to the intensive care unit (NICU) of Mohamed VI University Hospital of Marrakesh, Morocco, during the year 2016.

CASES REPORT**Case 1**

She was a female neonate; her mother's old was 40 years and was non vaccinated. The delivery took place at home with the use of "KHÔL": (mineral powder used for eye makeup) at the level of the umbilicus, which remains a traditional practice in some areas in Morocco.

The newborn was admitted at the 13th day of life, for an

opisthotonos attitude associated with hypertonia, trismus, refusal of sucking and fever appeared in the 3rd day of life. The Dakar score was 4 and classified the newborn in group III according to the Mollaret classification. The newborn was sedated, intubated, ventilated at admission; curare and anti-tetanus serum were prescribed. Neonatal infection was associated, with a leukocyte count above 25000/L, the antibiotics was administered. The evolution was marked by death after 5 days of his hospitalization, from septic shock, despite antibiotics and Dobutamine administration.

Case 2

He was a male newborn, his mother was 25 years old, she received only 2 doses of tetanus vaccine, spaced more than one year, in a dispensary. The delivery was made at the hospital. The newborn admitted at 15 days of age for generalized spastic hypertonia with decortications, trismus, and neonatal respiratory distress. The DAKAR score was 4 and he was in the group III according to the Mollaret classification. The newborn was intubated, ventilated, sedated, received antibiotics associated with curare. The patient died on the 7th day after his hospitalization.

Case 3

He was a male newborn; his mother's old was 35 year, the

pregnancy was not monitored, at term and the delivery was made at home. He presented at 11th day with the diagnosis of neonatal tetanus: Axial and peripheral hypertonia associated with generalized tonic seizures and trismus. The DAKAR score was 3 and he was classified in group II of the classification of Mollaret. The patient was intubated, ventilated and sedated with the administration of curare, antibiotic therapy and anticonvulsant therapy. The evolution was complicated with hemodynamic worsening, the blood culture was objective: *Acanitobacter Baumannii* improved with Colistin; it was a nosocomial infection. The patient was extubated on day 14 of hospitalization and discharged at 23 days of admission.

Case 4

He was a male newborn, his mother's old was 38 years, non vaccinated against tetanus. The pregnancy was not monitored; the delivery was made at home by a traditional midwife with section of the umbilical cord by non sterilized scissors. The newborn was admitted at 9 days of life, he presented with trismus and opisthotonos attitude. The DAKAR score was 4 and he was classified in group III according to the classification of Mollaret. The newborn was intubated, ventilated and sedated with antibiotics and anti-tetanus serum. The evolution was marked by the worsening of the hemodynamic state with renal failure. The newborn died at the 22nd day of his hospitalization.

All four cases are summarizing in Table 1.

DISCUSSION

In 2015, WHO estimated that neonatal tetanus (NT) was responsible for 34 019 deaths worldwide, a reduction of about 96% when compared with the late 1980s [1]. In 1995, Morocco succeeded in achieving the World Health Organization's goals of reducing the rate of neonatal tetanus to <1 case / 1000 births through a national campaign between 1987 and 1995, Which increased the proportion of women of childbearing age vaccinated against tetanus from 32% to 75% [2]. NT elimination is defined as < 1 case of NT per 1000 live births per year in all districts of a country [3]. In this study; NT constitutes 0.68%

of the hospitalizations during the year 2016, with a mortality rate of 75%. In 2002, a survey showed that the mortality rate for neonatal tetanus declined further to less than one case per 1,000 live births in all districts, which meant that Morocco had effectively eliminated the disease.

Tetanus spores are very resistant and remain in the environment in extremes of temperatures for long time. Due to the nature of the disease, tetanus cannot be eradicated; the goal is thus to eliminate maternal and neonatal tetanus as a public health problem.

NT infection begins when *Clostridium tetani* spores, introduced into the umbilical tissue during delivery or cord care practices, produce a neurotoxin at the site of the umbilical cord wound that passes into the blood stream of the newborn and into the central nervous system. The portal of entry in the newborn, in the majority of cases, was the umbilicus, by the use of non sterilized material or by the application of contaminated substances [4] such as non sterilized scissors and "KHOL" in these previous cases.

Neonates are protected from tetanus by passive transfer of maternal antibody across the placenta. Pregnant mothers who have not received full immunization require two dose of tetanus toxoid spaced at least one month apart to generate sufficient antibody for this purpose. A third dose is recommended after delivery to promote long-term immunity. Approximately 80% of maternal antibodies are still present in infants one month after delivery thus protection is maintained until a primary vaccination course is given and is maximal at the most vulnerable period when umbilical infection may occur [5].

In this study, only one woman who had received 2 doses of vaccine, but spaced more than 1 year. This shows that women were irregularly advised and unaware of the need for the vaccine and the dangers of the disease. Illiteracy, low socio-economic status and distance from health centers in rural areas could be an explanation.

It causes motor neuron hyperactivity, hypertonia and muscle spasms. Death occurs as a result of paralysis of the respiratory

Table 1: Summarizing the salient points of all four cases.

CASES	CASE 1	CASE 2	CASE 3	CASE 4
Sexe	female	male	male	male
Age	13 days	15 days	11 days	9 days
Mother's vaccination	No	2 doses spaced	No	No
Risk factor	Use of "KHÔL"	-	The delivery was made at home	The delivery was made at home with section of the umbilical cord by non sterilized scissors
Clinical symptoms	Opisthotonos attitude ,hypertonia, trismus and fever	Generalized spastic hypertonia , decortications, trismus, and neonatal respiratory distress	Axial and peripheral hypertonia, generalized tonic seizures and trismus	Trismus and opisthotonos attitude
Dakar score	4	4	3	4
Mollaret classification	Group III	Group III	Group II	Group III
Evolution	Death	Death	Good evolution after a nosocomial infection	Death

muscles and/or inability to breastfeed. It has been reported from the earliest medical writings [6]. The patient with tetanus requires simultaneous attention to several concerns. Attention to the airway and to ventilation is paramount at the time of presentation, but the other aspects of care, especially passive immunization, must be pursued as soon as the respiratory system is secure. The goals of therapy are to eliminate the source of toxin, neutralize unbound toxin and prevent or abort (as the case may be) muscle spasms, monitoring the patient's condition and providing support - especially respiratory support - until recovery [7].

Different prognostic classifications of neonatal tetanus have been proposed; in these cases two scores were used: the score of DAKAR (1975) and the classification of Mollaret [8].

In the Dakar hospital, a similar retrospective study was made on Tetanus in neonates: On admission, 64% of NT presented with severe tetanus (stage III on the Mollaret scale) [9]. Dakar score was used for neonatal and child tetanus morbidity and mortality in the University hospitals of Abidjan, Côte d'Ivoire, in a study realized between 2001 and 2010: Lethality was 60% for NT with a positive correlation with the score \geq (p = 0.005) [10].

The treatment in the neonatal tetanus is disappointing, showing the need to implement others medication. Tetanus remains a fatal disease; several causes of death have been reported in the literature: cardiovascular, respiratory, metabolic complications, septic shock, nosocomial pneumopathy were the main cause of deaths [11].

CONCLUSION

Despite the real progress made in Morocco for the eradication of neonatal Tetanus, sporadic cases still occurring due to the absence of maternal immunization and some cultural practices. It is necessary to review the local eradication strategy. Currently the treatment is essentially preventive, based on immunization, population education and improvement of hygiene conditions.

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