

Neonatal Tetanus in Mashhad (North East of Iran) over a 17 Year period

hasan motaghi moghaddam¹; sepideh bagheri¹ ; moslam moosa farkhani¹

1. Department of pediatrics, Mashhad University of medical sciences, Mashhad, Iran.

ABSTRACT

Introduction: Neonatal tetanus is a highly fatal disease that can be prevented by immunization and improvement in obstetric practices. The aim of the present study was to assess the characteristics of cases of neonatal tetanus in two large tertiary hospitals (Ghaem and Imam Reza hospitals) of Mashhad -North East of Iran between 1984- 2001.

Methods: all cases whose epidemiological and clinical characteristics were compatible with neonatal tetanus and were admitted into the NICU's of these two hospitals between July 1984 to June 2001 were analyzed from their hospital records.

Results: A total of 60 patients had been hospitalized with the diagnosis of neonatal tetanus during the study period. All of them were delivered out of hospital by untrained birth attendants and none of the mothers had been immunized against tetanus during pregnancy. 74% of infants died. Age younger than 7 days at the time of admission was associated with a high mortality rate.

Conclusion: Although neonatal tetanus is a highly fatal disease yet. It can be prevented with appropriate health care practices and tetanus immunization of pregnant women

Keywords: neonatal; tetanus; tetanus toxoid; immunization

Introduction

Neonatal tetanus is one of the major causes of neonatal mortality in many developing countries¹. The World Health Organization (WHO) has estimated that it accounts for about 7% of neonatal deaths worldwide². It is an acute disease which is first characterized by inability in sucking which progresses into generalized rigidity and convulsive spasms of skeletal muscles². In most cases symptoms ensue within 3-14 days after birth¹. Infection occurs due to lack of hygiene during childbirth and it usually occurs when the umbilical cord becomes contaminated as a result of being cut with a non-sterile object or non-sterile dressing². Widespread immunization of pregnant women and women of reproductive age with tetanus toxoid helps in the prevention of disease³.

The case fatality of the disease is very high. In the absence of medical care and treatment, mortality approaches 100% but with hospital care 10-60% of cases will die¹. So, prevention of the disease by means of immunizing pregnant women and hygienic childbirth practices and cord care is both more effective and of course much more cost-effective⁴.

In Iran, implementation of mass immunization has greatly reduced the incidence of neonatal tetanus. According to WHO statistics in 2011 only 2 cases of NT has been reported from Iran⁵.

In this study we retrospectively evaluated the clinical findings, risk factors and outcome of NT cases hospitalized in the NICU's of two great tertiary hospitals of North of Iran (Ghaem and Imam Reza hospitals in Mashhad, Razavi Khorasan province) between 1984-2001.

Material and Method

This was a retrospective study. All the cases admitted to the NICU's of Ghaem and Imam Reza hospitals over a 17-year period (1984-2001) were reviewed. All the cases with the final diagnosis of NT were analyzed. NT was defined according to the WHO standard case definition:

- 1) Normal feeding and crying for the first two days of life
- 2) Onset of symptoms between 3 and 28 days of age.
- 3) Inability to suck followed by muscle spasms and rigidity.

Data obtained for each patient included: age at onset of symptoms, age on admission, age at the time of death (if the patient died), weight, sex,

* Corresponding author: Sepideh Bagheri, Department of pediatrics, Mashhad university of medical sciences, Mashhad, Iran. Email: bagheris@mums.ac.ir

duration of hospitalization, maternal immunization, place of delivery, cord care.

Statistical analysis :

Data were analyzed using Spss 10 statistical package. For normally distributed data student's t test was used. $P < 0.05$ was accepted as significant. Results are given as mean \pm SD.

Results

60 patients were admitted with the diagnosis of NT during the study period. 10 of them were excluded because their medical records were not complete and 50 (35 males and 15 females) were included in the study. The mean age of patients was 6.8 ± 2.06 days (range 3-15 days). The mean birth weight of patients was 3075 ± 380 gr. 37 (74%) of the patients died and the mean age at death was 14.2 ± 10.9 days.

All patients had been delivered out of hospital and non-sterile instruments were used to cut the cord including: scissor (60%), knife (20%) and razor blade (20%). None of the mothers had been immunized with tetanus toxoid during pregnancy. The main clinical signs and symptoms of the patients were lack of sucking (100%), trismus (100%), spasticity (90%), seizure (80%), fever (60%), cyanosis (40%), omphalitis (40%) and respiratory distress (20%).

The mean age at the onset of symptoms was 6.2 ± 1.03 days. Infants who died had a mean age of 5.7 ± 2.1 days vs. 7.8 ± 4.2 days in the surviving infants. The mean age of the patients at the onset of symptoms was significantly lower in the surviving group ($p < 0.0001$).

We could not show a statistically significant difference between birth weight and mortality ($p = 0.13$)

Discussion

Reducing the mortality from NT is regarded as one of the simplest and most cost-effective methods of reducing the neonatal mortality rate^{6,7}. This can be achieved through the immunization of all pregnant women and women reproductive age with tetanus toxoid and promotion of hygienic deliveries^{8, 9, and 10}. NT occurs most commonly in underdeveloped and low income countries⁵. In Iran implementation of mass immunization and health promotion has led to the elimination of this disease. According to WHO reports cases of NT in Iran has declined from 107 cases in 1982 to 2 cases in 2011⁵.

In our study 30 cases were admitted between 1984 -1987 and 10 cases between 1988 -1990 and

10 cases between 1991- 2001 which shows the declining nature of this disease in our region.

Our study showed that age less than 7 days at presentation is associated with greater mortality which is similar to previous studies^{6, 11 and 12}.

All the NT cases were due to non-hygienic birth practices and non-immunized mothers which is similar to other studies from other parts of the world^{13, 14 and 15}. Mean age at death was similar to studies in Nigeria and Pakistan^{13, 16}.

Low birth weight is considered as a risk factor for mortality in NT¹¹ but we could not show such a correlation in our study.

Conclusion

Al though NT is a highly fatal disease, it can be prevented through immunization of pregnant women and hygienic delivery and cord care. As in our country with the implementation of immunization and promotion of hygienic deliveries NT has successfully been eliminated.

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