Neonatal tetanus in the middle Black Sea region of Turkey

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We retrospectively analyzed 62 cases with neonatal tetanus (NT) seen in the Department of Pediatrics of Ondokuz Mayıs University from 1989 to 2001. Epidemiological characteristics and prognostic factors on survival were investigated. We grouped the patients into two groups, the survivors and those who died. All patients were born in non-hygienic conditions, coming from rural regions. None of the mothers had been immunized against tetanus. The mortality rate was 40% (25 of 62 cases) and the only two poor prognostic factors on survival younger were age younger than five days at onset and the presence of fever. There was no significant difference between the two groups regarding the other known prognostic factors. Although the NT rate is declining, we must continue to protect against it by strictly enforcing preventive policies, especially in rural regions.

Key words: neonatal tetanus, Turkey.

Neonatal tetanus (NT) is characterized by marked failure to suck, opisthotonus and spasms that occur thee to 14 days after septic delivery[1]. Although it can be prevented by immunization and aseptic delivery, it is a major cause of mortality in the neonatal period in developing countries, especially in Southeast Asia, Africa and the eastern Mediterranean region. Over 400,000 deaths are estimated to occur worldwide annually[1-3]. NT continues to occur in Turkey, despite the nationwide anti-tetanus immunization policy[4-8]. Here we report 62 cases with NT in our center, and analyze the possible factors affecting the prognosis and clinical features.

Material and Methods

We retrospectively analyzed the patients with NT who had been admitted to the Department of Pediatrics of Ondokuz Mayıs University Hospital, Samsun, Turkey, from 1989 to 2001. The diagnosis was based on the history of septic delivery and clinical observation of failure to suck, spasticity, trismus, opisthotonus or risus sardonicus.

Blood glucose, calcium and magnesium levels were determined. Lumbar puncture was performed to exclude central nervous system infection. The cords that were suspicious for the entry of microorganisms were excised. All patients were placed in silent and dark room to prevent contractions. We used diazepam, tetanus anti-toxin or tetanus immunoglobulin and benzylpenicillin as conventional treatment. Cases who showed evidence of secondary infection received appropriate antibiotic combinations. All patients were kept in a quiet, darkened room, and interventions were kept to a minimum.

We divided the patients into two groups: survivors and those who died of disease. We analyzed the prognostic factors on survival with the statistical program SPSS 6.0 on computer, and p value of <0.05 was considered significant.

Results

There were 62 patients with NT [40 (65% male, 22 (35%) female]. Most of the deliveries were at home in non-hygienic conditions, and none of the mothers had been immunized with tetanus toxoid or attended healthcare services during pregnancy. All of the families were of low socioeconomic level. Most of the mothers only attended primary school. Razor blade (65%), scissors (19%), and knife (16%) were used to cut the umbilical cord. Thirty-seven cases survived. The remaining 25 (40%) of 62 patients died of disease and formed the second group. Characteristics of the groups are

shown in Table I. The median hospitalization period was five days for fatal cases and 29 days for survivors. Clinical characteristics of the patients are shown in Table II.

The mean age of the cases who died was significantly lower than the survivors at admission ($p<0.05$). Birth weight and gender of two groups did not significantly differ. Although the duration of symptoms was longer in the survivors group, there was no significant difference between the two groups. We failed to find any specific symptom or sign affecting survival of patients, except fever at presentation.

Table I. Characteristics of cases with neonatal tetanus

	Survivors		Deceased	
	Mean±SD	Range	Mean±SD	Range
Age (days)	7.8±2.1	4-11	4.9±1.9	2-10
Birth weight (g)	3140±498	2000±4100	3020±448	1900-4200
Male/Female	24/13		16/9	
Age at onset of symptoms (days)	6.2±1.3	2-12	3.1±1.4	1-6
Duration of symptoms (days)	2.2±1.2	1-4	1.9±1.0	1-3

Table II. Symptoms and signs of cases with neonatal tetanus

	Survivors (37)		Deceased (25)	
	N	%	N	%
Spasticity	28	75	20	80
Poor sucking	26	70	16	64
omphalitis	23	62	14	56
Trismus	22	59	14	56
Fever	10	27	14	56
Risus sardonicus	10	27	6	24
Cyanosis	9	24	6	24
Other infections	14	37	10	40

Discussion

Tetanus occurs worldwide and is endemic in 90 developing countries. The most common form, neonatal tetanus, kills approximately 500,000 infants each year because the mother was not immunized. In addition, 15,000 to 30,000 non-immunized women worldwide die each year from maternal tetanus[1,2]. Although the incidence of NT is declining by widespread use of tetanus toxoid in pregnant women, an increasing number of hospital births and improvements in postpartum hygiene, it is still a problem, especially in the rural regions of Turkey[4-8]. There were 133 cases with NT in our hospital from 1978 to 1988[5]. On the other hand, we found only 62 cases with NT over the past 12 years, in spite of an increasing number of cases within the newborn period. Only two cases with NT have been detected in our clinic in the past year. This suggests the improvement of health conditions in the Black Sea region of Turkey. Other reports form Turkey also indicate a decreasing incidence of NT.

Neonatal tetanus occurs soon after the delivery in non-hygienic conditions. Immunization profile of the mother against tetanus is usually inadequate or absent. It is frequent in the rural regions in which the deliveries occur by untrained traditional birth attendants[1,2,9]. All of our patients were from the rural regions of the Black Sea and they were born in non-hygienic conditions. None of the mothers had been immunized against tetanus. Similar characteristics can be seen in the other reports from different parts of Turkey.

Neonatal tetanus occurs more in males than in females[4,5]. In our series, males were also seen more frequently (62%) than females. Incubation period, severity of illness, preterm birth, infant's weight, secondary infection, age at onset, fever, risus sardonicus, opisthotonus and mode of treatment affect the survival of patients with NT. In our study, mortality was significantly increased with age at onset under five days and the presence of fever. Our study did not

demonstrate that the previously reported prognostic indicators significantly affected NT survival in our region. The fatality rate was 40% in our cases in accordance with the other series[4-9].

Tetanus is one of the preventable diseases through widespread immunization. Additional precautions including the education of mothers, and hygienic delivery care and umbilical cord management will help prevent NT. Health care professionals dealing with preventive medicine should strictly carry out immunization against tetanus and educate the mothers.

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