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Tetanus Neonatorum in the Bethesda Hospital Yogyakarta

by

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Abstract

Thirty cases of tetanus neonatorum admitted to the Bethesda Hospital Yogyakarta, from January through December 1974, were analyzed. Twenty seven cases (90%) were born at home attended by traditional midwives, 2 (6.7%) were delivered at home attended by midwives while 1 (3.3%) was born in the obstetric ward of the hospital. The fatality rate is high. The possible cause of neonatal tetanus in these cases might be the delivery at home by traditional midwives and the application of contaminated materials such as traditional medicines on the umbilical stump. Tetanus neonatorum is an important cause of neonatal death in rural areas. The cost of treatment of tetanus neonatorum is much higher than the cost of antenatal tetanus immunization, which is one of the practical effective and safe methods in preventing tetanus neonatorum.

Introduction

Tetanus neonatorum is a preventable disease. However, the incidence is usually high in developing countries (Chen, 1974). In these countries the high incidence may result from the fact that health services have not got the chance to develop properly, especially in rural areas and remote places as the idea of health is not too well comprehended by the majority of the people. Tetanus immunization in expecting mothers has become one of the effective and practical methods for preventing tetanus neonatorum. This prenatal immunization requires relatively low cost compared to the treatment of tetanus neonatorum. The purpose of this paper is to present the socio-economic background, incidence, mortality rate, and the possible cause of neonatal tetanus.

Material and methods

The case records of tetanus neonatorum admitted to the Bethesda Hospital Yogyakarta from January 1973 until December 1974 were analyzed. The patients came from the D.I. Yogyakarta area where most of them were from rural areas with poor health services. All patients were treated with the following procedures :

— On the day of admission the patient in convulsion was given a combination of 20-30 mg. luminal and 5 mg. valium intramuscularly. In case of continuous convulsion treatment was continued until the best relaxation was reached (Sunarto and Dradjad

Boediman, 1972). Further treatment includes Japhactil 2-4 mg./kg. body weight/day, valium 2-4 mg./kg. body weight/day given orally (Liem Wie Tjoen et al., 1970), or using new solution of chloral hydrate when the convulsions were frequent.

- A dose of 10,000 — 20,000 U anti tetanus serum given on admission.
- Penicillin 50,000 — 100,000 U/daily given intramuscularly.
- If necessary the thick mucus was cleaned off by means of an endotracheal tube, oxygen, and other nursing procedures applied properly.
- Food given by means of gastric drip.
- On the following day of tetanus serum treatment, the patient was given tetanus toxoid of 0.6 ml. (5Lf).

Results

Between January 1973 and December 1974 there were 30 cases of tetanus neonatorum (6% of neonatal admission), with 326 days of total admission.

a. Socio-economic background is as follows :

8 cases: sufficient, low income employees whose salary is spent only for purchasing simple food and clothes.

13 cases: poor farmers with incomes barely enough for buying food daily.

9 cases: poor people who owns no rice-fields and work as unskilled laborers. Their income is solely for purchasing food twice daily, having bean-curd or bean-cake as their dessert only very rarely.

- b. Dwelling :
- 3 cases lived in town near the hospital.
 - 27 cases lived in the countryside and remote places in the mountains. 12 cases were from villages at a distance 3-5 km. from the nearest Health Center which can be reached by bicycle.
 - 15 cases were from remote places in the mountains having a distance 6-10 km. from the nearest Health Center; their only means of transport was by foot.
- c. Health consciousness of the parents can be divided as follows —
- 3 cases had a slight health consciousness; in case of illness they usually send for the nurse. Child delivery was always in the hands of a midwife.

19 cases had a very low health consciousness; in case of illness they turn to traditional doctors or midwives.

8 cases with even health consciousness. When prenatal care of expecting mothers were not regular, they always turned to a traditional midwife for child delivery. When they became ill they call on a traditional doctor (dukun) or a medical assistant.

4 cases had simple health consciousness; in case of illness they seek help from a medical assistant or a nearby doctor. They prefer a midwife for child delivery. However, in cases of economic difficulties the child delivery took place at home performed by a traditional midwife.

TABLE 1: Number of cases by place of delivery

	No. of cases by place of delivery			Total
	Home delivery by		Delivery clinic	
	Traditional midwife	Midwife		
Rural	—	2	1	30
Urban	27	—	—	
	90%	6.7%	3.3%	100%

* Place of delivery
According to Table 1 there are : 27 (90%) cases having home delivery, helped by traditional midwives, including the ones who had not undergone intensive practical training on

midwifery, i.e. old women, neighbors, and house-wives.
2 (6.7%) cases having home delivery helped by midwives, but further treatment and care were taken by the parents.

1 (3.3%) case being born at a delivery clinic and helped by a midwife; the treatment and care at this clinic lasted for 5 days.

* Umbilical stump treatment.

There are 30 cases: 29 cases with umbilical stump treatment done at home by means of topical application

TABLE 2: Instruments used by traditional midwife for cutting the umbilical cord

Unsterilized scissors	Unsterilized knives/razor blades	Sharp sliver of bamboo	Total
4	5	18	27
14.7%	18.5%	66.7%	100%

Of these 27 cases helped by traditional midwives, 18 had the umbilical cord cut by means of a sharp sliver of bamboo (66.7%), 5 experienced umbilical cord cutting by means of unsterilized sharp knives or razor blades (18.5%), and 4 cases had the cord cut by means of unsterilized scissors (14.7%).

Fig. 1 shows the frequency distribution of cases during treatment or hospitalization. The duration of hospitalization is between 1 and 32 days, with an average of 11 days.

* The onset of illness.

The first symptom in the majority of cases was refusal to suck. Age of patient at the onset of illness was figured from the day of birth to the first symptom. Age of patient at the

of traditional medicine made from herbs or covered with unclean cotton. 1 case was nursed at delivery clinic for 5 days and further was nursed at home.

Instruments used by traditional midwife in cutting the umbilical cord are shown in Table 2.

onset of illness was between 3 to 12 days, with an average of 6 days (Fig. 2).

* Fatality rate.

From the 30 cases mentioned, 29 got medical treatment conventionally, while 1 case underwent combined treatment of tracheotomy plus conventional treatment. If 9 moribund cases are separated from these 30 cases, it is discovered that the fatality rate was 61.9%.

Discussion

I. Cause of neonatal tetanus.

The main cause of neonatal tetanus is the contamination of umbilical stump or wound by the spores of *Clostridium tetani*, resulting in the absorption of the specific exotoxin and tetano spasmia

(Jelliffe, 1970; Chen, 1974). The majority of cases were born at home, and only helped by relatively untrained persons in insanitary surroundings. The instruments used for cutting the umbilical cord were not sterilized, while the umbilical treatment was done by the parents, who applied traditional medicine on the wound. It is found that of the 30 cases, 27 (90%) were born at home in the hands of traditional midwives (dukun), while 3 (10%) were attended by midwives.

The application of traditional herbs, face powder, and traditional Chinese medicine to the umbilical stump facilitates the incidence of *Clostridium tetani* contamination. In developing countries, the incidence of neonatal tetanus may decrease provided that the existing health services function properly and develop proportionately including adequate training for the traditional midwives and the enhancement of the people's health consciousness. The simplest and most effective way to prevent neonatal tetanus is by way of immunization of the expecting mothers.

II. Incidence and fatality rate.

The incidence of tetanus neonatorum in developing countries is high indeed, and so is the fatality rate. The incidence in the rural areas is often not definitely known; in spite of considerably good existing system of recording, disease reporting is still slow and unreliable. The same situation is also encountered in West Malaysia (Chen, 1974). At the Department of Child Health, University of Indonesia Jakarta, this disease is com-

mon. The fatality rate with conventional treatment is still high, i.e. in 1964 it was around 81.6% and in 1965 it was 84.1% (Sutedjo et al., 1966). This high rate was caused by the fact that the majority of patients were in a critical condition when admitted to the hospital.

The fatality rate of neonatal tetanus in 1958 was 98.6%, while in West Malaysia in 1973 20.6%; the difference was possibly due to the quality of medical and nursing care given to these patients (Chen, 1974). Death caused by cerebral anoxia may occur in neonatal tetanus because of a blockage in the air passage (trachea) by thick mucus or a deposit of mucus in the lungs due to continuous spasm of the respiratory muscles, pharyngospasm, or by the existing bronchopneumonia complication (Sutedjo et al., 1966; Liem Wie Tjoen et al., 1970; Retno Trenggonowati et al., 1971). Thus, neonatal tetanus is an important cause of death among infants in countries where health services are not well developed yet and also where midwifery services are still inadequate.

III. Prenatal tetanus immunization.

Effective measure for the prevention of neonatal tetanus is immunizing pregnant women with tetanus toxoid. Two injections will prevent 80% and complete protection can be expected from three monthly injections (Morley, 1974). A maternal antitoxin titre of 0.01 U/ml. or more at delivery is accepted as protective (Stanfield et al., 1973). Prevention against neonatal tetanus with 2 injections of an aluminium phosphate

adsorbed toxoid given 6 weeks apart to pregnant women produced better sustained antitoxin levels than 3 injections of plain toxoid also given 6 weeks apart. The antitoxin level was sustained for at least 2 years (Lennan et al., 1965).

Carolyn et al. (1970) found that immunization with an aluminium adjuvant toxoid could maintain the mean maternal protective antitoxin levels for 40 months after 2 primary and booster injections. For the prevention against tetanus neonatorum, the Bethesda Hospital Yogya-

karta has carried out tetanus immunization among expecting mothers during the last three months of pregnancy.

IV. Medical expenses for one case of tetanus neonatorum.

The cost of treatment for one case of tetanus neonatorum is Rp. 250.— per day of hospitalization. The amount for total hospitalization being usually as high as Rp. 7,000.—, which is far more expensive compared to that of tetanus immunization during pregnancy which is around Rp. 400.— only.

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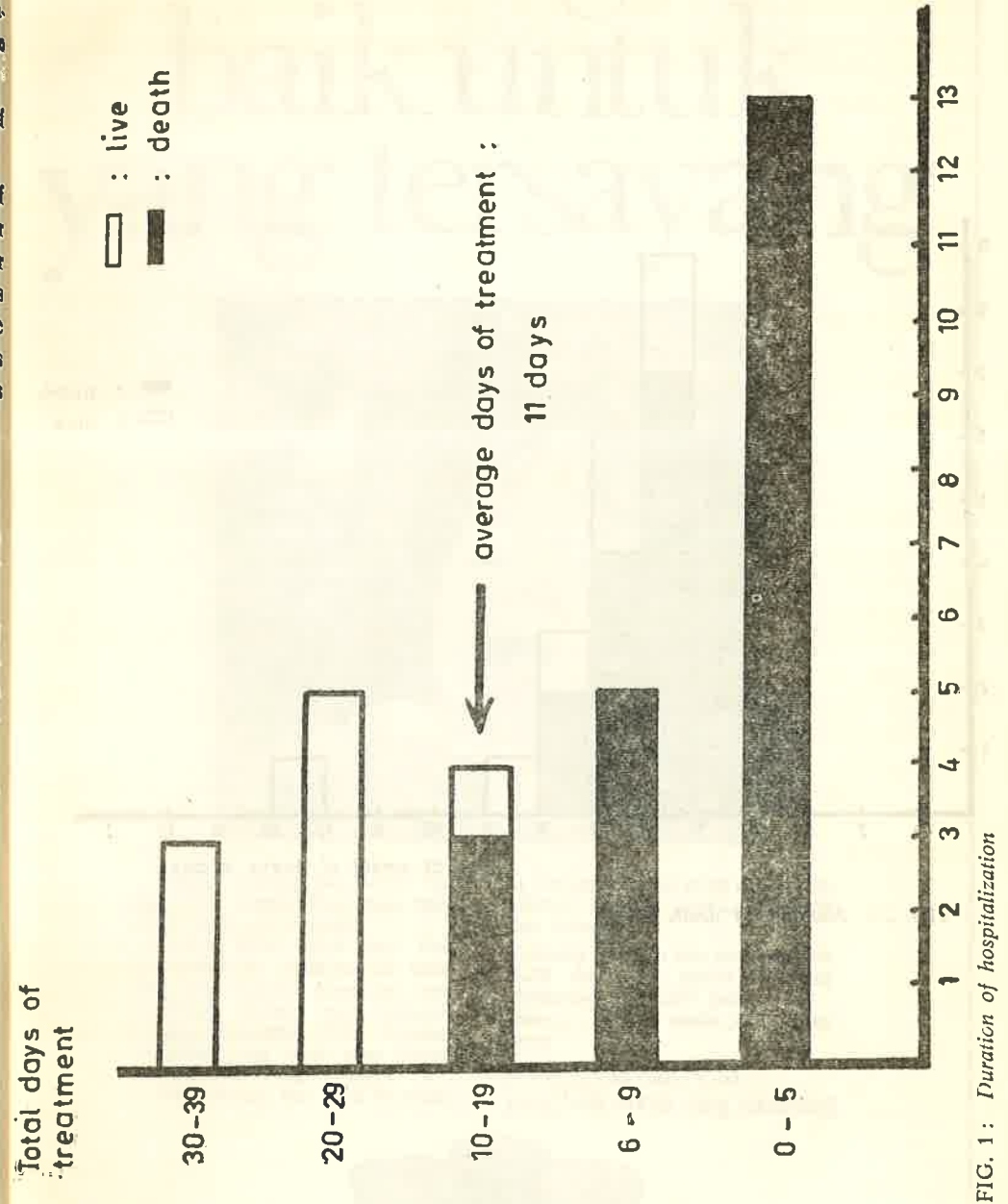


FIG. 1: Duration of hospitalization

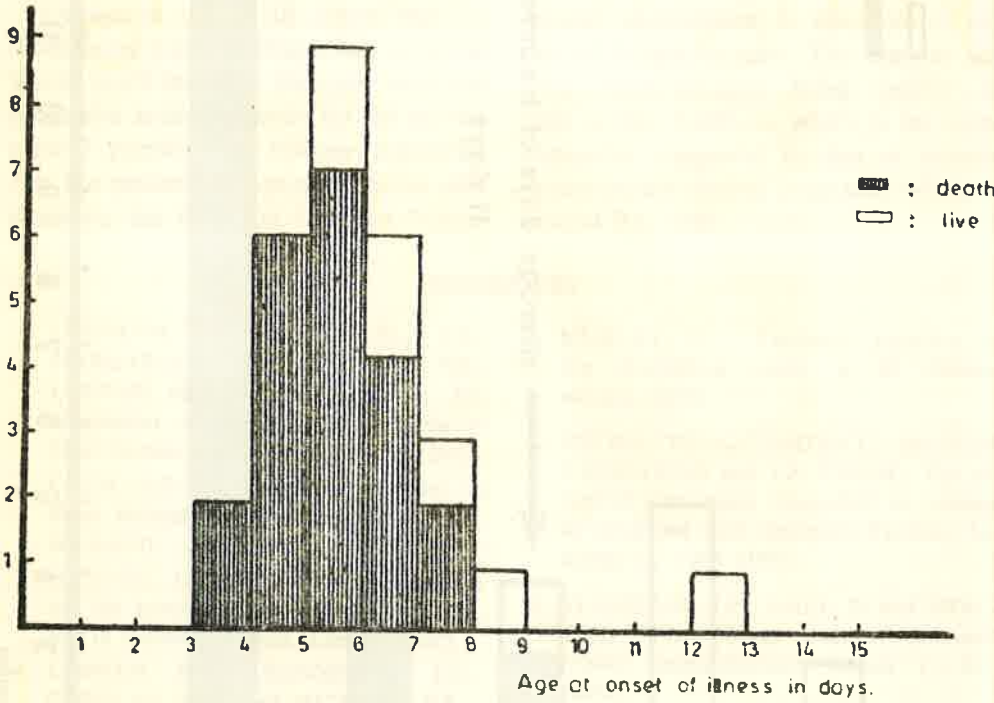


FIG. 2: Number of death cases