TETANUS NEONATORUM TREATED BY A SINGLE HIGH DOSE OF A.T.S. SUBCUTANEOUSLY AROUND UMBILICUS

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Abstract

Thirteen cases of neonatal tetanus were treated conservatively between 1976 and 1977. A single dose of A.T.S. was infiltrated subcutaneously around the umbilicus and sedation and antibiotics were given as required along with special nursing care. In a previous study (Rathore 1976) large amounts of A.T.S. were given in divided doses by both intravenous and intramuscular routes, the mortality rate was 74 per cent, while in the present series the mortality was reduced to 30.7 per cent.

Introduction

Tetanus is a serious problem in developing countries and neonatal tetanus is its worst form carrying a mortality rate of 90 per cent (Weinstein 1973). The ideal treatment is provided by the use of muscle relaxants and intermittent positive pressure respiration (Adams et al., 1959; Busuttil et al., 1974; Symthe et al., 1974) which can reduce mortality to a minimum. Such facilities may not be available in developing countries for sometime to come and hence the reliance has to be made on a suitable conservative regime of treatment.

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Material and Method

On admission to hospital 5 mg of Diazepam was injected intramuscularly and if the convulsions were not controlled 10 mg of phenobarbitone was given by the same route. 200 ml of half potency normal saline with 50,000 units of A.T.S. was then given as subcutaneous infusion around the umbilicus. The weight of the infant was recorded daily. Mother's expressed breast milk 1/2 oz, 3 hourly was given through a polythene neonatal nasogastric tube and the quantity was increased slowly to 3 oz 3 hourly. The naso-gastric tube was aspirated each time before a feed and if the residue in stomach was large the interval between the feeds was prolonged.

2,50,000 units of crystallin penicillin was injected every 6 hours intramuscularly for 5 days as a routine. In patients with badly infected umbilicus or other infections 75 mg of Ampicillin was either injected intramuscularly every 6 hours or given orally through the nasogastric tube for one week.

Sedation was provided by oral Diazepam 0.8 mg per Kg body weight 6 hourly and additional sedation was provided with 5 mg of phenobarbitone per Kg of body weight. The sedation was given until the convulsions were stopped and the infant was asleep with intact tactile stimuli.

The patient was nursed in a quiet dark room. Colour, pulse, respiration, temperature, urinary out-put and bowel activity were observed carefully. A suction unit was always available to prevent airway obstruction either from regurgitration or excessive secretions.

Table 1: Detail of the Cases of Tetanus Neonatorum Treated in the Present Series.

No.	*Name*	*Sex*	*Age*	*Date of admission*	*Weight lb oz*	*Date of discharge*	*Weight lb oz*	*Result*	*Comments*
1.	B.A.	Male	3 days	23- 6-76	6—5	21- 7-76	7—6	Survived	—
2.	C.B.	Male	3 ,,	22- 7-76	4—6	22- 7-76		Died during the injection of A.T.S.	Respiratory Failure.
3.	G.R.	Male	15 ,,	25- 7-76	5—8	30- 8-76	5—8	Survived	Amaebic dysentry.
4.	B.Y.	Male	5 ,,	29 -7-76	7—2	12- 8-76	7—8	Survived	—
5.	B.N.	Male	11 ,,	21- 8-76	6—3	20- 9-76	7—7	Survived	Diarrhoea
6.	N.M.	Male	16 ,,	9- 9-76	5—13	19-10-76	7—10	Survived	Diarrhoea
7.	B.A.	Female	4 ,,	14- 9-76	5—6	17- 9-76		Died	L.A.M.A. Umbilical Sepsis.
8.	B.K.	Male	7 ,,	8-10-76	4—12	8-10-76		Died	L.A.M.A. Premature
9.	B.A.	Male	8 ,,	26-11-76	5—9	3-10-76	8—6	Survived	Had 2nd dose of A.T.S., Meningitis excluded from series.
10.	M.A.	Male	21 ,,	4- 1-77	7—4	12- 1-77	7—0	Survived	—
11.	G.F.	Female	16 ,,	5- 1-77	6—0	9- 1-77	5—14	Survived	—
12.	G.N.	Male	6 ,,	15- 1-77	6—0	17- 1-77		Died	Had 2nd dose of A.T.S.
13.	B.F.	Female	19 ,,	26- 1-77	4—5	5- 3-77	5—6	Survived	Premature, nursed in incubator for 53 days. Diarrhoea and chest infection.
14.	B.A.	Male	11 ,,	9- 4-77	6—14	26- 4-77	6—12	Survived	Had 2nd dose of A.T.S.

torum were admitted to the paediatric ward of St. Raphael's Hospital, Faisalabad from June 1976 to May 1977. One was excluded from the series after meningitis was diagnosed. Nine cases came from urban districts, while the other four came from rural areas. However, all of them had been delivered at home by an untrained midwife. In every case scissors had been used to cut the cord, which were normally used for household tasks. Most of them were wrapped in dirty rags. Only one baby had actual umbilical sepsis and died. All the cases were from illiterate families although some of them were quite wealthy. Out of 13 cases, three were premature, weighing less than 5 lbs. Only one of them survived. Ten babies were males and three females. Out of thirteen cases, four died giving an overall mortality rate of 30.7% (Table II). Out of four cases 2 died in the hospital from respiratory failure due to persistant convulsions, the other two cases left the hospital against medical advice and died at home—one on the first day after leaving the hospital, and the other on the fourth day. The cause of death was probably respiratory failure. One premature infant who survived was nursed in an incubator for fifty-three days.

Table II: Distribution of Sex

Sex	*Numbers*	*Dead*	*Mortality*
Male	10	3	30.0%
Female	3	1	33.3%
Total	13	4	30.7%

Discussion

Tetanus is still a world wide problem. Its neonatal form has a particularly poor prognosis. Although it is now rare in the developed world, it is common in the under developed countries where the standard of antenatal care, hygiene, and midwifery services is still low. A variety of contaminated articles are employed to sever the cord at birth and dirty rags, often soiled with faeces, are used to tie and cover the umbilical stump (Friedlander 1951). Unlike adults, the focus of infection in neonates is always in the umbilicus. Failure to suck and inability to swallow are usually the earliest signs to be noted (Ganendran 1974). Thus it is often diagnosed and treatment is provided only when the disease is quite advanced and the patient is convulsing with opisthotonus and cyanosis.

Brown et al. (1960) and Busutill et al. (1974) have successfully treated tetanus with high doses of A.T.S. However, in 5 to 30 percent of the cases (Furste 1974) there were allergic reactions particularly when doses were repeated. Lately, hyper-immune gamma globulin of human origin has been used for neonatal tetanus (Crimaldi et al., 1973) in order to avoid these hyper-sensitivity reactions. However, we have no experience of this.

Penicillin, given in high doses, is still the most efficient antibiotic against cl. tetani-other useful drugs being ampicillin, tetracycline, chloromphenical and kanamycin.

For sedation most authorities consider Diazepam (Cardova, 1969; Ganendran, 1974; Hendrickse and Sherman, 1966; Oduori, 1974) to be the best drug although meprobomate (Perlstein et al., 1960) phenobarbitone, chlorpromazine (Adams et al., 1959; Laurence et al., 1958) and paraldehyde (Symthe et al., 1974) have also been used in the treatment of tetanus neonatorum.

Local wound care and excision of the infected area is also recommended in the treatment of tetanus. Where this is not possible local instillations of antitoxins around the known or suspected infected area is useful (Weinstein 1973). Omphalectomy has been performed by Dietrich (1951) with good results in neonatal tetanus. In the present series we have combined high doses of A.T.S. with local instillation, and have injected 50,000 units of A.T.S. subcutaneously as a single dose around the umbilicus followed by sedation and antibiotic therapy. The overall mortality rate of 30.7% in the present series compares favourably with that observed in other series where similar conservative methods had been used (Table III).

Table III: Mortality of Tetanus Neonatorum Treated by Conservative Methods

Authors	*No. of cases*	*Mortality*
Gek (12) (1951)	174	91%
Tomkins (24) (1958)	134	89.9%
Adams (1) (1959)	40	77.5%
Wright (26) (1960)	217	82.5%
Hendrickse (13) (1966)	104	54.8%
Barten (2) (1969)	134	39.6%
Busuttill (4) (1974)	5	80%
Rathore (20) (1976)	14	74%
Rathore (Present series)	12	30.7%

Tetanus is a preventable disease and where adequate obstetric facilities are provided it does not occur. Ebisawa (1967) recommended that all mothers should be encouraged to have their deliveries in institutions where improved obstetrical facilities for the care of the mother's reproductive tract and the baby's umbilical cord are available. Maternal immunisation with tetanus toxoid has also been advocated (Dhillon and Menon, 1975; Maclennan et al., 1965; Miller, 1972) for the prevention of tetanus neonatorum. In developing countries like Pakistan, the hospital beds and obstetrical facilities are limited and therefore most deliveries are conducted at home by unqualified midwives. Facilities for maternal immunisation are also very inadequate. Intensive care units for intermittent positive pressure ventilation will take time to set up. Therefore in these countries, one has to rely mainly upon traditional methods.

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