NEONATAL TETANUS IN CALABAR: A 4-YEAR RETROSPECTIVE STUDY

OE ANTIA-OBONG* AND NW IKPATT+

Summary

Antia-Obong OE and Ikpatt NW. Neonatal Tetanus In Calabar: A 4-year Retrospective Study *Nigerian Journal of Paediatrics* 1991; **18(3)**: 94-98. All cases of neonatal tetanus admitted into the University of Calabar Teaching Hospital (UCTH), Calabar during the period of four years (January 1983 to December 1986) were retrospectively studied. There were 606 cases which represents 31% of the 1940 outborn infants admitted during the period. The mortality rate was 51%, and it accounted for 71% of deaths among outborn neonates during the period. A majority (99%) of the mothers were delivered at home by Traditional Birth Attendants and were derived from Calabar municipality and the surrounding areas. The high prevalence of neonatal tetanus in our environment casts doubts on the effectiveness of the on-going immunization campaign. There is a dire need to review the strategies of the existing antenatal care/immunization processes with greater emphasis on out-reach rather than hospital immunization posts. Traditional midwives require unabated scrutiny and education and should perhaps be allowed to administer tetanus toxoid since their role is over-whelming and unavoidable in our community.

Introduction

Several reports have shown that neonatal tetanus constitutes an important health problem in developing countries,[1-14] where ignorance, poverty, unhygienic care of the umbilical cord and poor medical services are highly prevalent. The yearly incidence in these parts of the world are however not known due to absence of accurate records. In India, following a national sample survey by the Directorate of General Health Services in 1981-82, it was estimated that about 110,000 cases occurred annually, out of which about 100,000 die. During the last 4 decades, the results of several hospital-based studies on neonatal tetanus in Nigeria[1 2 5-7 10-12 14 16-19] have shown a reduction in case fatality rate from 96%[1] and 89.6%[2] in 1950 and 1958 respectively to 60.3%[18] and 54.4%[19] in 1986. Though the current fatality rates remain unacceptably high, this progressive decline in death rates over the years may be attributable to improved management capabilities. Information from community-based surveys of neonatal tetanus in Malawi and Cameroun[20] and Cote d'Ivoire[21] give mortality rates of 12, 7 and 18 per 1000 live births respectively. Based on these surveys, it is estimated that about 150,000 neonatal deaths occur annually from tetanus in Africa.

College of Medical Sciences,
University of Calabar

*Department of Paediatrics
+Department of Paediatrics

Correspondence: Antia-Obong OE

To the best of the authors knowledge, there has hitherto been no comprehensive report on neonatal tetanus from Calabar although it is the leading cause of neonatal deaths[22]. The present study was therefore undertaken to provide data on this preventable disease in the University of Calabar Teaching Hospital (UCTH), Calabar.

Materials and Methods

This is a retrospective study of all cases of neonatal tetanus seen at the UCTH in a 4-year period (January 1983 to December 1986). The UCTH is a major referral centre for the South-East of Nigeria and also functions as a general hospital for Calabar municipality and the adjoining Local Government Areas of Odukpani and Akamkpa.

In the UCTH, neonatal services are provided in 2 areas; the Special Care Babies Unit (SCBU) and the Upper Block (UB). Infants born in hospital and those referred from outside within 48 hours of delivery are admitted into the SCBU, while the rest of outside deliveries are admitted into the UB. The tetanus unit which has 10 "sorrento cots" is within the UB. It is manned by at least 2 nurses during the day and usually one at night. Mothers are allowed to sleep in.

Records of patients were studied and information extracted included place of birth, age on admission, sex, instrument used in severing and methods of dressing the umbilical cord, duration of hospital stay, associated diseases, treatment and outcome. In addition, information on the immunization status, occupation and addresses of the mothers were obtained. Infants whose case notes were missing, contained scanty information or were discharged against medical advice were noted but excluded from detailed analysis.

Diagnosis of tetanus was based on the clinical observation of trismus, inability of suck, generalised rigidity and muscle spasms. Our standard management regimen consisted of:

(i) Intramuscular anti-tetanus serum 5,000 units on admission,

(ii) Diazepam 5mg and chlorpromazine 6.25mg every six hours through a nasogastric tube at 9 am, 3 pm, 9 pm and 3 am alternating with,

(iii) Phenobarbitone 5-10mg six hourly through a nasogastric tube at 6 am, 12 noon, 6 pm and 12 midnight,

(iv) Intramuscular paraldelyde 0.15ml per kg body weight for break through spasms,

(v) Procaine penicillin 150,000 units daily for 5 days and

(vi) Intramuscular gentamicin 5mg per kg/day and intravenous ampicillin 100mg per kg/day for 10-14 days when septicaemia was suspected.

Adequate fluids and calories were given through a nasogastric tube till the infant could suck. A very important aspect of nursing care was nasopharyngeal suction and oxygen administration when patients became apnoeic. Bed rokes were prevented by regular change of position and progress was monitored by a chart of the frequency and severity of muscle spasms. The Chi square and Student's 't' tests were used for statistical analysis of data.

Results

In the 4-year period under study, 1940 neonates were admitted into the Upper block (UB) of the UCTH. Of this, 606 (31.2%) were tetanus made up of 304 males and 302 females approximately equal sex ratio. The yearly frequencies were 127, 182, 132 and 165 for 1983, 1984 1985 and 1986 respectively. Fig 1 shows the monthly pattern of admissions. Three hundred and nineteen (52.6%) cases were admitted during the rains (May - October) and 287 (47.4%) between November and April which coincided with the dry season. The difference in seasonal admissions was not statistically significant ($t=0.71$; $p0.2$). There were 187 patients from Calabar municipality, 323 from villages in the adjoining Odukpani and 96 from Akamkpa Local Government Areas. All infants were from low socio-economic background. Of the 487 mothers whose occupations were recorded, 364 were subsistence farmers, 96 were petty traders while 27 were unemployed housewives.

Outcome was recorded in 557 cases, which excludes 49 who had left against medical advice. Detailed analysis was carried out on 479 patients whose case notes were complete.

Age on Admission

The age on admission ranged from 2 to 21 days, with a majority (67.6%) hospitalised from the fifth to seventh days of life (Fig. 2). One hundred and sixty-four (34.2%) of the 479 patients were admitted at the age of 7 days. The mean age on admission was 7.4± 2.8 days.

Place of Birth

Four hundred and thirty-six (91%) of the 479 were delivered at home by traditional birth attendants (TBAs) while 38 (8.0%) were delivered in churches and 5 (1%) in health institutions other than the UCTH.

Antenatal Care and Immunization against tetanus

Four hundred and twelve (86.0%) of the mothers did not have antenatal care in health institutions. Only 10 (15%) out of 67 mothers who visited antenatal clinics were even partially immunized.

The Umbilical Cord

The umbilical cords of all 474 (99%) infants delivered at home and in churches were severed with new razor blades, while a pair of scissors was used on the 5 (1%) delivered in health institutions. substances used in dressing the cord included sand, sputum, palm oil, "dusting powder", vaseline", "mentholatum" and herbal concoctions among others. The commonest method however, was the mixture of sand and sputum used on 261 (54.5%) infants. Forty-five (9.4%) infants had spetic umbilical stumps on admission.

Outcome

Two hundred and eighty-four (51%) of 557 infants died and 273 (49%) survived. There were 134 males and 150 females in the group that died and 142 males and 131 females in the group of survivors. males and females were equally represented among the survivors and the dead. Tetanus constituted 71.4% of the 398 neonatal deaths in the UB of the UCTH.

TABLE I

Age on admission and fatality rate in 479 Neonates with tetanus

Age (days)	No. of patients admitted	No. of deaths	Fatality rate %
2-5	107	77	71.9
6-8	267	168	62.9
9-12	60	11	18.3
13-21	45	2	4.4
Total 479	258	53.9	

x^2 = 97.7; p<0.001

The mean ages on admission for those who died and the survivors were 6.6 ± 2.5 day and 8.9 ± 3.4 days respectively (t =5.88; p)

TABLE II

Duration of hospital stay and fatality rate in 479 neonates with tetanus

Duration	No of Patients	No. of deaths	Fatality rate % (days)
1-3	200	200	100
4-6	66	52	78.8
7-9	39	5	12.8
10-12	35	1	2.9
13-37	139	0	0
Total	479	258	53.9

x^2 = 414.1; p

Table II shows the relationship between the duration of hospital stay and fatality rate. The case fatality rate was inversely proportional to the period of hospitalization (x^2 = 364; p). The mean duration of hospital stay of the fatal cases was 2.5± 2.9 days but 17.4± 7.3 days for the survivors (t=21.3; p). The majority of deaths (252 or 97.6% of 258) occurred during the first 6 days of hospitalization, and was highest in the first 3 days.

Other conditions found in association with neonatal tetanus were conjunctivitis 144 (30%), impetigo

contagiosa 91 (19%), bronchopneumonia 54 (11.3%), neonatal jaundice 34 (7.1%) and suspected septicaemia in 47 (9.8%).

Discussion

The findings of this study are of particular interest in view of the current global effort to prevent common childhood diseases among which is neonatal tetanus. The study identifies neonatal tetanus as a major health problem in Calabar and its surrounding areas. The condition accounted for 31% of neonatal admissions from outside the UCTH and 71% of deaths among this group. In this series, only 31% of cases came from the municipality while 69% were from the surrounding areas. This is likely a reflection of a decline in immunization coverage from the hospital environment towards the periphery or surrounding areas.

The mortality rate of 51% in this study is high, but similar to the experience in other tertiary health institutions in Nigeria[5 16-19] In addition our pattern of deaths was equally similar, in that case fatality rate was highest (72%) in patients aged 2-5 days on admission and also during the first 3 days of admission (100%), followed by 79% in the next 3 days. Among factors underlying neonatal tetanus in this study were low socio-economic status, deliveries at home and churches, non-immunization of pregnant mothers against tetanus and unhygienic care of the umbilical cord. Ninety-nine percent of patients in this series were delivered by TBAs at home. This is similar to the findings of Tompkins[2] in which all deliveries were at home. TBAs are readily available and affordable in rural areas, but unfortunately their unhygienic method of cord care contribute to neonatal tetanus.

Among the Efiks, neonatal tetanus is know as "oron". They believe that, this disease is contracted by a newborn through the umbilical stump from any woman whose infant died of a similar illness. Arising from this superstition every effort is geared towards ensuring early separation of the cord. This involves the application of substances such as sand, palm oil, sputum, herbal concoctions and other deadly items to the cord. These substances may be contaminated by spores of *Clostridium tetani*, while the oily agents produce an anerobic environment which encourages the organism to thrive.

With the introduction of the Expanded Programme on Immunization (EPI) in Nigeria in 1984, it was expected that a high proportion of pregnant women would be immunized against tetanus with a consequent reduction in the prevalence of neonatal tetanus, but unfortunately this has not been the case. Negative propaganda has led to poor turn-out for immunization as mothers are made to believe that tetanus toxoid is a device by government to render women infertile in order to limit population. Furthermore, the cost of booking for antenatal care, in most hospitals including the UCTH is beyond the reach of most families leading to poor utilization of this service. In Mozambique,[23] the successful implementation of EPI in 1979, has been attended by a reduction in the incidence of neonatal tetanus.

There is therefore the need to re-examine the EPI strategies employed in this part of Nigeria. We recommend the separation of immunization posts for tetanus from the routine antenatal clinics where fees are usually charged. There is the need to intensify health education to eliminate harmful practices and superstition in the society. TBAs should be identified and trained to improve their technique and allowed to administer tetanus toxoid. Since Nigerian mothers are inevitably more likely to co-operate with TBAs who live with them in the same community, incentives such as monetary rewards should be given to TBAs who produce evidence of immunizing all pregnant mothers in their care.

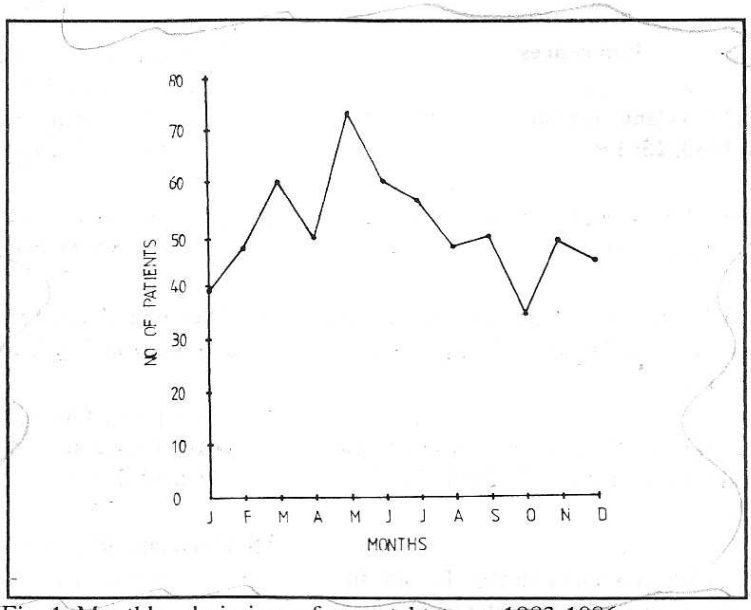

Fig. 1. Monthly admissions of neonatal tetanus 1983-1986

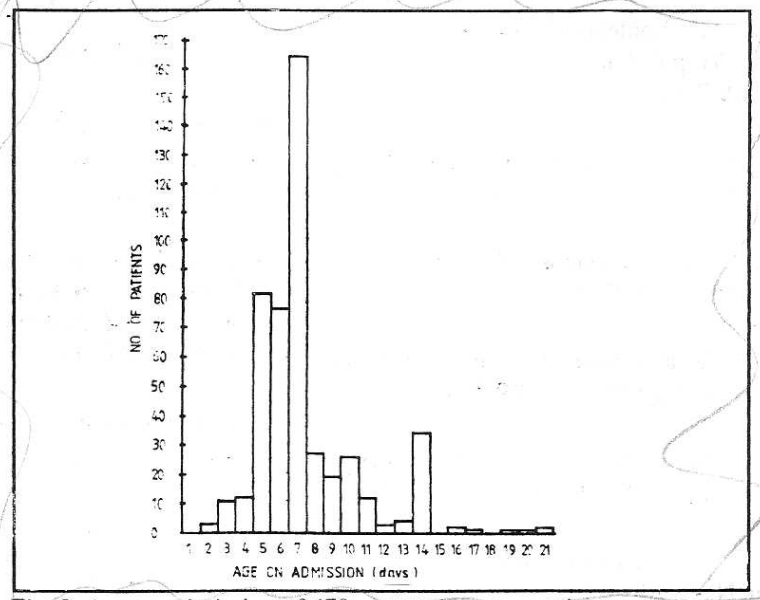

Fig. 2. Age on admission of 479 neonatal tetanus patients

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