

Neonatal Tetanus in Port Harcourt

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Summary

Oruamabo RS and Mbuagbaw LT. Neonatal Tetanus in Port Harcourt. *Nigerian Journal of Paediatrics* 1986; 13: 115. A review of one hundred and thirty six cases of neonatal tetanus admitted to the University of Port Harcourt Teaching Hospital between September 1983 and December 1985 showed an overall case fatality rate of 60.3%. Neonatal tetanus accounted for 10.2% of neonatal admissions and 30% of neonatal deaths. Although 57.4% of the infants were delivered at home by traditional birth attendants, as many as 18.7% were delivered in medical establishments. Death rates within the first five days of admission were higher than they were afterwards ($p < 0.0001$). The high mortality rate could be reduced by improving the quality of the nursing care and by making the essential drugs available in our hospitals while preventive measures on a large scale are required to control the disease.

Introduction

NEONATAL tetanus remains a common disease in most developing countries where ignorance, poverty and inadequate medical services prevail.¹⁻³ Globally each year, approximately 500,000 deaths from tetanus occur and approximately 50% of these are in neonates.⁴ A World Health Organisation (WHO) sponsored survey in Bangladesh in 1977, estimated that of the 75,000 cases of neonatal tetanus seen, 70,000 died.⁴ The case fatality rate in Nigeria ranges from 55-74%.^{1 5-7} It has been canvassed that if active immunisation

of mothers against tetanus during pregnancy could be made universally available, the incidence of neonatal tetanus would be reduced both in Nigeria⁸ and elsewhere.⁹ An immunisation programme to cover all females of child-bearing age in developing countries, will achieve the same objective.

To the best of our knowledge, there has been no previous report on neonatal tetanus from Port Harcourt or from any centre in the Rivers State of Nigeria. The purpose of this study therefore, was to provide epidemiological and clinical data on this disease from that part of the country.

Subjects and Methods

The study was based in the department of paediatrics, University of Port Harcourt Teaching Hospital (UPTH), a major referral centre for all the ten local government areas of the Rivers

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State and parts of Imo State. The UPTH department of paediatrics consists of a main children's ward and a Special Care Baby Unit (SCBU). There are 45 cots in the main ward, including 14 cots for paediatric surgical cases. All cases of neonatal tetanus and most other outborn neonatal cases are admitted into the main ward.

The case records of all children with neonatal tetanus admitted between September 1983 and December 1985, were retrieved from the Records Department and relevant data extracted from them. The diagnosis was based on clinical features only, and consisted usually of failure to suck either from the breast or feeding bottle, followed within a short interval, by stiffness of the body and tetanic spasms.

Facilities available for management of the cases were in general, sparse. The babies were nursed in two darkened siderooms, each of which contained a medium-sized cot; by placing the babies across the cots, each cot could be used to nurse a maximum of three neonates. Nursing care was provided by one staff nurse and three third-year student nurses during the daytime and by one staff nurse alone, at night. Supervision was by a nursing sister on duty at each shift. The drug treatment was standardized and consisted of:

- (a) anti-tetanus serum (ATS) 10,000 units on admission,
- (b) phenobarbitone 7.5mg - 15 mg every six hours through a nasogastric tube at 6.00 am, 12.00 noon, 6.00 pm and 12.00 midnight alternating with,
- (c) chlorpromazine (*Largactil*) 6.25-12.5mg every six hours through the nasogastric tube at 9.00 am, 3.00 pm, 9.00 pm and 3.00 am.
- (d) intravenous (iv) or intramuscular (im) diazepam 2.5 - 5mg for breakthrough spasms only, was administered three-hourly, when necessary.
- (e) im benzyl penicillin 250,000 units 12-hourly for at least, 48 hours, followed

by procaine penicillin 250,000 units daily, for another 5 days. The rationale for changing to procaine penicillin was to minimize the number of im injections

The babies were fed through nasogastric tubes which were passed on admission and left *in situ*. The daily requirement was calculated at 150 ml per kg body weight and given at 3 - hourly intervals. The positions of the infants were changed at feeding times and dusting powder applied to the body to prevent pressure sores. Oxygen, when necessary, was administered via a face mask while suction of the nasopharynx was carried out as and when necessary. Active immunisation with tetanus toxoid (0.5ml im) was commenced for survivors, prior to discharge.

Statistical analysis was carried out using the chi-square test and the Students t test.

Results

The total number of admissions during the period of study was 155; this was made up of 88 males and 67 females, a male/female ratio of 1.3:1.

The 155 admissions for neonatal tetanus constituted 4% of a total of 3,858 admissions into the paediatrics department during the period of study. Among this number were 1,520 neonates. Table I shows the seasonal pattern of admissions, survivals and deaths among 136 of the 155 neonates with tetanus for the period of study; neonatal tetanus occurred practically all the year round. The peak in each of 1984 and 1985 was in May to August and coincided with the rainy season. There was however, no significant relationship between neonatal tetanus admission rates and the months of the year ($p > 0.1$).

Place of delivery

Eighty-nine (57.4%) of the 155 infants were products of home deliveries by traditional birth attendants (TBAs), while 29 (18.7%) were delivered in various medical establishments namely, private maternity centres 13, government

TABLE I
Survivals/Deaths among 136* Neonates with Tetanus

Month and Year	Survivals		Deaths		Total Admitted	Total No of Deaths	% Mortality
	Males	Females	Males	Females			
Sept-Dec 1983	3	1	6	2	12	8	66.7
Jan-April 1984	6	6	5	6	23	11	47.8
May-Aug 1984	8	4	6	10	28	16	57.1
Sept-Dec 1984	4	4	7	3	18	10	55.6
Jan-April 1985	3	2	5	6	16	11	68.8
May-Aug 1985	2	4	11	5	22	16	72.7
Sept-Dec 1985	3	4	6	4	17	10	58.8
Total	29	25	46	36	136	82	60.3

*Nineteen others were discharged against medical advice

hospitals 9 and private clinics 7. Three infants were delivered in prayer houses while one was delivered in a boat. The place of delivery of 33 infants (21.3%) was not stated.

The umbilical cord

Sixty-six infants had septic umbilical stumps on admission; majority of these were delivered by TBAs, but 4 were delivered in government hospitals, 8 in private maternity centres and 2 in private clinics. In 15 infants, the cord was recorded as healthy on admission, while in 74 cases, no mention was made of the state of the cord.

The mode of cutting the cord was recorded in 55 of the infants delivered at home, and among these, the cord was cut with new razor blades in 48 (87%), with pairs of scissors in 4 (7%), and with pen knives in 3 (5%). Among the cases delivered in private maternity homes, relevant information was recorded in only 2; the cord was cut with a new razor blade in one of these and in the other, a pair of scissors was used.

Substances used in dressing the cord included methylated spirit, traditional herbal mixtures, dusting powder, palm kernel oil, *Vaseline*, alligator

pepper and *Robb*. In one case, the cord was dressed with the mother's breast milk.

Outcome

Nineteen of the infants were discharged against medical advice. Eighty-two of the remaining 136 infants died, giving an overall case-fatality rate of 60.3%. Of the total of 548 deaths recorded in the department during this period, 272 were among neonates. Neonatal tetanus thus accounted for 15% of all deaths and 30% of neonatal deaths. The male/female ratio in the 82 infants who died, was 1.3:1, compared with one of 1.16:1 among the survivals; this difference was not statistically significant ($p > 0.5$).

Table II shows the relationship between the age on admission and mortality. The difference in death rates among those infants aged 1 to 7 days and those older, was statistically significant ($p < 0.001$). As many as 77% of all deaths had occurred by the fifth day of admission (Table III). The mean lengths of stay in hospital for the cases who died and for the survivors were 4.6 ± 4.08 and 21.7 ± 11.3 days respectively. This difference in the mean length of stay of the two groups was highly

TABLE II

Age on Admission and Mortality, in 136 Neonates with Tetanus

<i>Age (days)</i>	<i>No of Patients</i>	<i>No of Deaths</i>	<i>% Mortality</i>
1-7	92	68	73.9
8-14	39	12	30.8
> 14	5	2	40.0
Total	136	82	60.3

$$\chi^2_2 = 22.19; p < 0.001$$

TABLE III

Duration of Stay in Hospital and Mortality

<i>Duration (days)</i>	<i>No of patients</i>	<i>No of deaths</i>	<i>% Mortality</i>
0 - 5	63	63	100.0
6 - 10	21	13	61.9
11 - 15	13	4	30.8
> 15	39	2	5.1
Total	136	82	60.3

$$\chi^2_3 = 95.82; p < 0.0001$$

significant ($p < 0.001$). Furthermore, there was a very significant difference in death rates during the first five days of admission and afterwards ($p < 0.0001$).

Analysis of the admission temperatures in all the patients revealed that the mean admission temperature in the 82 patients who died was $38^\circ\text{C} \pm 1.3$ compared with $37.5^\circ\text{C} \pm 1.2$ among the 54 survivors; a difference that was statistically significant ($t=2.27$; $p < 0.05$).

It was not possible to investigate adequately for associated diseases among the patients, owing to inadequate laboratory facilities. However, one of the infants who died also had gastroenteritis

while neonatal jaundice was present in 4, purulent conjunctivitis in 2 and upper respiratory tract infection in one other.

Discussion

The overall case-fatality of 60.3% in the present series, agrees with those reported by others.^{2 3 5 10} Neonatal tetanus accounted for 10.2% of neonatal admissions and 30% of neonatal deaths in the present series. In earlier reviews from Nigeria, tetanus was responsible for 3.6%,⁵ 9.2%² and 9.8%¹¹ of neonatal admissions and accounted for 19.0%¹¹ and 16.8%¹² of neonatal deaths.

We cannot in the present study, state categorically, the number of deaths that were not directly attributable to tetanus owing to limited laboratory facilities. However, in earlier reviews by other workers,^{3 13} bronchopneumonia, asphyxia, septicaemia, severe gastroenteritis and dehydration and peritonitis, were cited as being responsible for such deaths.

In the present study, there appears to be a peak seasonal admission during the rainy season between May and August. This observation is in agreement with the report by Blankson,³ but contrasts sharply with that by Tompkins.¹⁴ The difference in the incidence of admissions between the rainy and other periods of the year in the present series, was however, not statistically significant. It is therefore, unlikely that climatic conditions have any influence on the incidence of neonatal tetanus in Port Harcourt.

However, our findings have confirmed that the age on admission, had some influence on the severity of neonatal tetanus. Several workers have reported that the age on admission, is a good index of the incubation period.^{2 14} Thus, in the present series, the mortality rate was highest among neonates with incubation periods of between 1 and 7 days. Similar relationship between the length of the incubation period and the mortality has earlier been reported by Blankson³ in Ghana and Tompkins,¹⁴ and Oyedeji *et al*⁵ in Nigeria.

In the present series, there was 100% mortality within the first five days of admission. Similar high death rates early in admission have been reported by workers both in Nigeria^{1 2 14} and elsewhere.³ In the present study, the survival rate increased very significantly, from the sixth day of admission. It follows therefore, that in the management of neonatal tetanus, more efforts should be directed towards the first week of admission, since there is a progressive increase in survival rate after this period. Several measures have been taken in an attempt to improve survival in neonatal tetanus. These include the use of muscle relaxants and intermittent positive pressure ventilation,¹⁵ addition of pyridoxine to the usual regimen⁹ and trials of intrathecal

antitetanus serum.^{16 17} The survival rate, we believe, could also be increased by improving the quality of the nursing care, providing more nurses per shift, and by making the essential drugs available in our hospitals. In the present series, commencement of therapy was often delayed because parents had to provide all the drugs and other materials necessary for the management of the babies.

On a larger scale, the high incidence of neonatal tetanus could be significantly reduced by preventive measures. More pregnant women should be encouraged to attend for antenatal care, and during such visits, active immunisation against tetanus should be carried out at the appropriate time. They should be encouraged to deliver in hospitals and before discharge, each mother should be shown a simple but hygienic method of carrying out daily cord toilet.

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