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Neonatal Tetanus in Ibadan

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Summary

Osinusi K, Dawodu AH, Sodeinde O and Adeyokunnu AA. Neonatal Tetanus in Ibadan. *Nigerian Journal of Paediatrics* **1986; 13: 121.** One hundred and thirty-six cases of neonatal tetanus admitted to the University College Hospital, Ibadan, over a five-year period (January 1979 to December 1983) were analysed. Although the disease was less prevalent than previously, it was still an important cause of neonatal deaths; the overall case fatality rate was 54.4%. Of the 63 patients in whom full information was available, 28 (44.4%) were delivered in hospitals and maternity centres, while 35 (54.6%) were delivered at home. The continued high mortality and the unexpected high occurrence of hospital-delivered babies among cases studied, call for (*a*) a review of our current management of neonatal tetanus, (*b*) close surveillance of the antenatal tetanus immunization programme and obstetric care provided within the community and (*c*) intensification of other efforts to prevent umbilical cord contamination during home delivery.

Introduction

THE high prevalence and mortality of neonatal tetanus in many developing countries[1-4] make the disease a major public health problem. Although effective methods of prevention are available,[5-7] many cases are still seen in clinical practice. A review of this disease from the University College Hospital (UCH), Ibadan, by Tompkins[8] in 1958, showed a high prevalence and a mortality rate of 89.6%. Since that report, there has been no other review of neonatal tetanus from this hospital although Effiong [9] in a review of morbidity and mortality in neonates seen in the hospital's Children's Emergency Room reported 38 cases with a mortality rate of 39.5%. The health facilities available in the city of Ibadan and its environs, though still sub-optimal, have improved significantly since Tompkin's report. The UCH and the general hospitals have expanded with marked increase in the medical and nursing personnel; the number of maternal and child health centres giving antenatal and health education services, including immunization, to the community, has also increased. The present study was therefore, undertaken to review the present status of neonatal tetanus in the hospital with particular reference to the impact of the improved

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health services and exposure to health education, on its prevalence and case fatality rate.

Materials and Methods

The subjects consisted of those cases who were admitted with a diagnosis of neonatal tetanus to the paediatric wards, University College Hospital, Ibadan, during a five-year period, January 1979 - December 1983. Relevant data extracted from the registers and available case notes included: place of delivery, age on admission, sex of patient, maternal antenatal tetanus immunization status, investigations carried out, treatment given and the outcome. The prevalence rate was calculated from the total number of admissions during the study period.

The diagnosis of tetanus, which was mainly clinical, was based on a history of inability to suck, excessive crying, spasms, trismus, abdominal and generalized rigidity. Management which had been standardized following results of previous research efforts,[1 10] consisted of neutralization of circulating toxins using 5,000 international units of antitetanus serum, elimination of the source of toxin, control of spasms, maintenance of patent airway and provision of adequate fluid and calorie requirements. Procaine penicillin was the usual initial antibiotic and a combination of parenteral cloxacillin and gentamycin was given when septicaemia was suspected or proven. Other supportive care included close monitoring of the vital signs and prevention of decubitus ulcers and contractures.

Results

During the five-year period under review, a total of 1,862 neonates were admitted into the children's wards. This number excluded neonates delivered in the hospital and those admitted into the special care baby unit. There were 136 cases of neonatal tetanus, constituting 7.3% of neonatal admissions.

Seventy-four (54.4%) of the 136 patients died, 47(34.6%) survived but the outcome was unknown in the remaining 15 (11.0%) cases, Deaths from neonatal tetanus constituted 18% of 412 neonatal deaths from all causes. The male: female ratio of all neonatal tetanus patients was 1.2:1 and the corresponding ratio for the dead patients and the survivors were 1.6:1 and 0.77:1 respectively.

Of the 63 patients in whom the case notes were available and more detailed information could be obtained, 28 (44.4%) were delivered in hospitals and maternity centres, while 35 (54.6%) were delivered at home and elsewhere (Table I). Seventeen (60.7%) of the 28 patients delivered in hospital and maternity centres had antenatal supervision either at the hospitals of confinement or other health institutions. None of the 17 mothers was immunized against tetanus.

TABLE I

Places of Delivery in 63 Cases of Neonatal Tetanus

Place of Delivery	*No of Cases*	*% of Total*
Home	33	52.4
General hospital	10	15.9
Maternity centre	9	14.3
Private hospital	7	11.0
Teaching hospital	2	3.2
Vehicle	1	1.6
Church	1	1.6
Total	63	100.00

Table II shows the relationship between mortality and age at admission. Of the 27 neonates who were admitted within the first 7 days of life, 22 (81.5%) died. The mortality fell to 40% in the group admitted at the age of 8-14 days while it was 33.3% in those over 14 days at admission. There was a significant association between age at admission and mortality ($X^2=11.67$; $p<0.01$). The mean duration of stay in hospital in the cases that died and those who survived, were 3.6 days and 23.5 days respectively; 82.4% of the deaths occurred before the 5th day of admission.

TABLE II

Mortality related to Age in 63 Cases of Neonatal Tetanus

Age (days)	*No of Cases*	*No of Deaths*	*Case Fatality Rate (%)*
3 - 7	27	22	81.5
8 - 14	30	12	40
> 14	6	2	33·3

$X_2^2 = 11.67; p<0.01$

Blood cultures were carried out in only 11 cases. The cultures were sterile in 4, the result was not available in one, while the cultures were positive in 6 patients; of these, 3 yielded *Staphylococcus aureus*, 2 *Klebsiella species* and one *E coli*.

Table III shows an improved mortality rate in the present study in comparison with previous series from Nigeria and other developing countries.

Discussion

The admission of only 136 patients with neonatal tetanus over a period of 5 years in the present series when compared with the 141 patients in Tompkins [8] series admitted over a period of 3 years, suggests that neonatal tetanus was now a less common cause of neonatal admissions than it was during the period covered by Tompkin's study. This impression is further supported by the observed fall in the prevalence rate: 7.3% in this study compared with 10.2% in Effiong's study[9] from the same hospital nine years ago. The prevalence is also lower than the 45% and 8.4% of all neonatal admissions reported from Lagos[11] and Benue-Plateau state[4] respectively. Although hospital-based figures are not the best indicators of the prevalence of a disease in a community, they nevertheless, help to monitor the success or failure of existing policies. Our study thus indicates that neonatal tetanus has probably become less prevalent in Ibadan than in the past. Factors responsible for

TABLE III

Comparative Mortality Rates in Neonatal Tetanus

Author and Place		*No of Cases*	*Case Fatality Rate %*
1. Tompkins,[8] Ibadan, Nigeria	(1958)	141	89.6
2. Athavale and Pai,[2] India	(1965)	319	73
3. Ogbeide,[11] Lagos, Nigeria	(1966)	154	67.5
4. Hendrickse & Sherman[1] Ibadan, Nigeria	(1966)	104	55
5. Idoko,[4] Benue-Plateau, Nigeria	(1975)	202	74.3
6. Blankson, [3] Ghana	(1977)	249	64
7. Adedoyin & Kadri,[16] Ilorin, Nigeria	(1982)	24	62.5
8. Oyedeji *et al*, [17] Ilesha	(1982)	104	59
9. Present study		136	54.4

the decrease in the number of cases might include antenatal immunization against tetanus, higher rates of hospital delivery and some health education activities by the various health institutions about the care of the umbilical cord.

In spite of the decrease in prevalence however, deaths from neonatal tetanus constituted 17.9% of all neonatal deaths during the review period. This figure is higher than previous ones of 16.8% and 16.3% reported from the same hospital by Adeyokunnu, Taiwo and Antia[12] and Effiong[9] respectively and indicates that neonatal tetanus has become more important as a cause of neonatal deaths in Ibadan. This might be as a result of improved neonatal care leading to a decrease in deaths due to some other causes. Although the case fatality rate of 54.4% in the present study is an improvement over the figures of 89.6% reported by Tompkins[8] in 1958 and by other workers from Nigeria and other developing countries, [1-4 8 11] the figure is still unacceptable. The improvement is not commensurate with the improvement in medical and nursing facilities at the UCH between 1958 and 1979.

Reports of marked reduction in mortality by the addition of pyridoxine and intrathecal antitetanus serum to the usual regimen from some centres,[13 14] call for further investigation of these treatment modalities. The use of intermittent positive pressure ventilation has also been shown to be effective in reducing mortality,[15] but this facility is unlikely to become routinely available for the treatment of neonatal tetanus in most developing countries in the near future.

Our finding of male preponderance among all neonatal tetanus patients and those that died, is similar to reports by other workers.[3 16 17] This might be because the disease is more common and more severe in males than in females. The preponderance of male tetanus patients might in turn, be due to the fact that more males than females are brought to the hospital for treatment because of the high premium placed on male children in this society; this however, does not fully explain the higher mortality among the males.

Forty-four per cent of patients in this study were delivered in health institutions. This is in contrast to Tompkin's series[8] in which none of the babies was delivered in a health institution but higher than 18% and 25% reported by Blankson[3] and Oyedeji[16] respectively. Factors probably responsible for the high incidence of hospital-delivered babies among our series include failure to immunize all the mothers who had antenatal care against tetanus, faulty sterilization techniques in delivery wards, early discharge from hospital after delivery and inadequate health education on the care of the umbilical cord. We can only speculate from the above that the health care delivery system inspite of the expansion of available facilities, is now partially responsible for the continued occurrence of neonatal tetanus while in the past, it was blamed almost entirely on lack of awareness on the part of the community, about the importance of antenatal care and hospital delivery.

The high mortality rate among children admitted within the first week of life is similar to the rates reported by other workers[3 16] and confirms previous observations that the shorter the incubation period, the worse the prognosis.

Traditionally in our part of the country, the cord is cut at birth, with blade, knife, or palm frond which are often unsterile and dressed with a variety of unsterile materials including cowdung, salt, shea-butter, gin, palm oil and various herbal mixtures. This customary practice of cord care, apart from causing tetanus infection, is capable of inducing other infections such as septicaemia which may contribute to high mortality in the disease. We were only able to assess the incidence of septicaemia from 11 of our patients, six of whom had positive blood cultures. This rate is much higher than the percentage of positive blood cultures among neonates seen at the UCH (unpublished data). This suggests that there may be a high incidence of septicaemia among patients with neonatal tetanus; prospective studies are required to verify this.

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