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Childhood Postneonatal Tetanus

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Summary

Gbadegesin RA, Adeyemo AA and Osinusi K. Childhood Post-neonatal Tetanus. *Nigerian Journal of Paediatrics* 1996; 23:11. A review of postneonatal tetanus in 42 patients aged between two months and 14 years admitted to the University College Hospital, Ibadan, between January 1989 and June 1992, is reported. The major portals of entry identified in 38 cases were wounds following trauma (50.0 percent) and chronic otitis media (34.2 percent). Six (14.3 percent) of the cases had received three doses of DPT vaccine during infancy, while another one had prophylactic anti-tetanus serum following trauma. Most of the patients attended the hospital long after the onset of spontaneous spasms and 71 percent after development of opisthotonus. The commonest associated morbidity was pneumonia which occurred in 19 percent of the cases and the case mortality was 20.0 percent. It is suggested that improved immunization coverage, pre-school booster dose of tetanus toxoid, education of health workers on the proper management of otitis media and judicious use of prophylactic antitetanus serum will help in reducing the incidence of the disease.

Introduction

TETANUS remains a serious public health problem throughout developing countries, despite the availability of a safe and effective vaccine.[1] Although it is much more important as a cause of mortality in neonates,[2-4] Hendrickse and Sherman[3] reported 45 cases of childhood tetanus occurring outside the neonatal period in Ibadan. Tompkins[2] in a study of 79 other postneonatal cases also in Ibadan, reported a 36 percent case fatality rate. In view of the paucity of data on non-neonatal tetanus in childhood generally since the above cited cases, this review was undertaken in order to delineate the pattern of occurrence of the disease and identify possible ways of reducing its morbidity and mortality.

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Patients and Methods

This was a retrospective study of cases of postneonatal childhood tetanus seen at the

department of Paediatrics, University College Hospital (UCH), Ibadan, between January 1, 1989 and June 30, 1992. All the patients older than 28 days who were admitted with a diagnosis of tetanus during the study period were reviewed. Information obtained from admission records included age and sex, date of presentation, immunization with tetanus toxoid or DPT, probable portal of entry, the intervals between sustenance of wounds and onset of the clinical features, associated morbidity and outcome.

The diagnosis of tetanus was clinical and was based on the presence of the characteristic features of the disease, including trismus, abdominal and generalized rigidity, tetanic spasms and opisthotonus. Management included the following: passive immunotherapy with intramuscular (im) equine anti-tetanus serum (ATS) 10,000 international units after a test dose; sedation and control of spasms with a combination of oral phenobarbitone 5-6 mg/kg/24 hours, oral chlorpromazine 2-5mg/kg/24 hours and oral diazepam 1-2mg/kg/24 hours administered such that the patient received some sedation every three hours, with im paraldehyde and intravenous (iv) diazepam being used for breakthrough spasms; continuous iv diazepam infusion for intractable spasms; endotracheal intubation for laryngeal spasm; im procaine penicillin 25,000 international units/kg/day (maximum 600,000 units/day) and surgical debridement of wounds that were probable portals of entry. Once adequate control of spasms was achieved, all the patients were fed by nasogastric tube until trismus disappeared. Survivors were actively immunized with tetanus toxoid.

Results

There were 57 cases of postneonatal tetanus during the three-and-half-year period of the review, but in the analysis of the cases, 15 (26.3 percent) were excluded because of inadequate data. Of the remaining 42 cases, aged between two months and 14 years, 26 (61.9 percent) were aged between five and nine years, while 14 (33.3 percent) were aged between 10 and 14 years. There were only two cases (4.8 percent) in the age group two to four months.

Immunization status and portal of entry

Six (14.3 percent) of the 42 patients claimed to have received three doses of Diphtheria-Pertussis-Tetanus vaccine (DPT) as part of the Expanded Programme on Immunization (EPI), nine (21.4 percent) had one or two doses of DPT, while the remaining 27 (64.3 percent) had not received any form of tetanus immunization. None of the immunized patients had received booster doses before or at school entry, or at any other time thereafter.

Probable portals of entry were identified in 38 (90.5 percent) of the cases (Table I). The commonest portals of entry were cuts, nail punctures and wounds from road traffic accidents involving the lower limbs in 19 of the 38 cases. The second portal was chronic otitis media and these two portals accounted for 84.2 percent of the 38 cases. Assuming that infec-

TABLE I

Probable Portals of Entry in 38 Cases of Tetanus*

Portal of Entry	*No of Cases*	*Percent of Total*
Wounds	19	50.0
Otitis media	13	34.2
Chronic ulcers	5	13.2
Circumcision	1	2.6
Total	38	100.0

* No probable portal of entry was recorded in four cases.

tion occurred at the time of the injury, the incubation period in those with wounds ranged from 3-16 days (mean, 10 days). The incubation period in the other cases could not be ascertained.

Clinical severity and associated morbidity

As no structured classification of severity was used at the time of admission of the cases, trismus, rigidity and spasms were used for classification as follows: mild disease (trismus and rigidity only), moderate (trismus, rigidity and provocative spasms) and severe disease (spontaneous spasm and opisthotonus at presentation). Using this classification, 26 (62.0 percent) of the cases had severe disease at presentation (Table II). It is noteworthy that 30 patients (71.4 percent) had opisthotonus on admission. Associated morbidity identified either at presentation or subsequently, included pneumonia in eight cases (19 percent), septicaemia and helminthiasis in two cases each (4.8 percent) and injection abscess in one case (2.4 percent). Duration of admission ranged from less that 24 hours to seven weeks.

TABLE II

Clinical Severity at Presentation in 42 Cases of Tetanus

Severity	*No of Cases*	*Percent of Total*
Mild	8	19.0
Moderate	8	19.0
Severe	26	62.0
Total	42	100.0

TABLE III

Portal of Entry and Mortality in 40 Cases of Tetanus

Portal of Entry	*No of Cases*	*No of Deaths*	*Percent Mortality*
Wounds	19	5	26.3
Otitis media	13	0	0.0
Chronic ulcers	5	1	20.0
Circumcision	1	1	100.0
Unknown*	2	1	50.0

*Two others were discharged against medical advice.

Outcome

The outcome was unknown in two cases who were discharged against medical advice. Thirtytwo (80.0 percent) of the remaining 40 patients survived, while eight (20.0 percent) died. The outcome was not affected by the immunization status, presence of opisthotonus at presentation or associated morbidity. All the 13 cases in whom otitis media was the portal of entry survived, while 26 percent of those with wounds as portals of entry died (Table III).

Discussion

The admission of 57 patients in three and a half years even though lower than that of 45 cases in one year reported from the same department in 1966,[3] is still significant for a readily preventable disease whose vaccine is part of the EPI. In contrast, only 70 new cases of tetanus in all age groups are reported in the United States annually.[5] With a failure rate of tetanus toxoid vaccination of less than 4/100 million in immunocompetent persons, tetanus should be an inexcusable disease in an immunocompetent host.[6] The findings in the present study however, strongly suggest that this is not yet the case in Nigeria.

The peak age prevalence found in the five-to-nine-year age group is similar to the earlier finding by Tompkins.[2] This may be due to the frequent injuries sustained during play by children in this age group. In those who were immunized in infancy, it may also be due to waning of previously acquired immunity in the absence of booster doses with tetanus toxoid. The low immunization rate in the present study would suggest that immunization with tetanus toxoid remains a major weapon for preventing the occurrence of the disease and that the aggressive drive towards immunization for all children should continue.

The portals of entry as reported here are similar to those previously reported from the same department.[2] The low mortality associated with otogenous tetanus has been reported by other workers[2,7] and has been explained on the basis of *Clostridium tetani* being an opportunistic secondary invader of the ear which, when maintained in purulent discharge, has its toxin inhibited by other substances in the exudate. Decreased absorption of the toxin may also occur, leading to a reduced degree of intoxication and a lesser severity of illness.[7]

The case fatality rate of 19.3 percent reported in the present series was lower than 36 percent reported by Tompkins in 1959;[2] it is also lower than those reported in adults and in neonates by other workers.[8-10] This finding would suggest that tetanus in the age group that was studied, carries a better prognosis than in neonates and adults. The reason(s) for this are unclear and perhaps require further studies.

From the present findings, it is suggested that the current programme towards universal child immunization be vigorously pursued. Greater efforts should also be directed towards increasing health workers' awareness of the importance of a judicious use of tetanus toxoid and ATS in the management of otitis media and traumatic wounds. Careful consideration needs to be given to the inclusion of a preschool booster dose of tetanus toxoid in the EPI. This will deal with the problem of waning immunity following immunization in infancy and thus reduce the risk of tetanus in the five-to-nine year age group. The continued occurrence of a potentially fatal, but vaccine-preventable disease in significant numbers, particularly when the vaccine is cheap and widely available, is unacceptable.

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