

REVIEW OF TETANUS ADMISSIONS TO A RURAL UGANDAN HOSPITAL

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Abstract

Tetanus, which can be eliminated through an effective immunization programme, remains a significant cause of morbidity and mortality in Uganda with a high case fatality rate. This study was carried out in St Francis Hospital Buluba (SFHB) after observing that the hospital was registering an abnormally high number of tetanus patients. Its aim was to retrospectively establish the socio-demographic characteristics of the patients and determine the case-fatality rate among tetanus patients admitted between 2005- 2008. Records of all patients registered and treated for tetanus up to the time of death or discharge on the Medical and Pediatric wards were evaluated. Case notes of 71 patients were retrieved and analyzed for clinical characteristics.

During the three-year period under study, 163 patients (0.65% of all admissions) were managed for tetanus. Analysis was done for only 154 (94.5%) patients because records of the others lacked basic data. The majority of the patients (67%) were males and most were young (81% were below 13 years of age). Forty two percent (42%) came from areas outside Mayuge district. The registered case-fatality rate was 47%, with mortality being highest in the extremes of age.

This paper recommends scaling up and sustaining immunization service to the whole population. Presentation of an immunization certificate should be made compulsory for all children joining school at all levels. Finally, programmes that help the population to access booster doses later in life should also be implemented.

Introduction

Though an effective tetanus vaccine has been available since 1923, tetanus remains a major cause of mortality in developing countries. In 2000, World Health Organisation (WHO) reported that tetanus infection was still widespread worldwide though accurate information about the disease, especially in the developing world, was very scanty (WHO, 2001).

The incidence of tetanus in the developed world is markedly low and this has been attributed to an effective immunisation programme (Thwaites et al, 2003). Currently in Uganda, the percentage of children below 1 year receiving 3 doses of DPT/ Pentavalent vaccine according to schedule averages 90% (MoH Uganda, 2009). This may be much lower in the rural countryside where the systems needed to support a comprehensive immunisation programme may be lacking. Also, programmes that may help the population access booster doses have been designed to specifically target females in the reproductive age

group leaving the males out (MOH Uganda, 2002). In countries like Uganda where manual agriculture is the key socio-economic activity, the majority of the population is prone to cuts and wounds in body extremities which predispose them to infection, including tetanus. Proper wound care after injury and awareness about the likelihood of tetanus infection are low and not guaranteed, making the chance of getting tetanus infection high.

Unfortunately, though tetanus is a disease of the developing countries, it requires very good facilities for its management so as to improve survival, which are often not available. In developing countries, mortality from tetanus averages above 50% whereas in the developed world where intensive care services (ICU) are available, only a mortality rate of up to 10% is deemed acceptable (George et al, 2005). This study was conducted to determine the mortality rate from tetanus at a rural hospital with no ICU services.

The setting was St Francis Hospital Buluba (SFHB), a rural hospital in south-eastern Uganda, 130 km east of the capital, Kampala. It is a mission private-not-for-profit (PNFP) hospital which sees just over 50,000 outpatients a year and has a ward capacity of 120 beds. It was started as a leprosarium but later expanded to offer other services and currently acts as the general referral hospital for Mayuge District (population: 330,000) while still maintaining specialized facilities for leprosy.

Materials and methods

We reviewed in-patient registers for all patients admitted to the paediatrics and general medicine wards between January 2005 and December 2008. Such ward registers capture the basic socio-demographic data, final diagnosis, inpatient days and outcome of hospitalization. Patients admitted and treated for tetanus were selected for analysis. However, only case notes of the 71 tetanus patients seen between 2007 and 2008 were retrieved for further analysis. These two years were selected because the case notes were easier to retrieve from the manual record system.

Results

A total of 25,118 patients were registered on the pediatrics and medical wards in the period of study. Of these 163 (0.65%) were managed for tetanus. Analysis was done for only 154 (94.5%) patients because the rest had incomplete basic information. Table 1 shows the socio-demographic characteristics of the cases.

Table 1: Characteristics of 154 tetanus cases

Characteristic	Cases (%)	Died (%)
Total	154	72 (46.8)
Sex		
Male	102 (66.2)	44 (43.1)
Female	52 (33.8)	28 (53.8)
Origin		
Within catchment	89 (57.8)	46 (51.7)
Outside catchment	65 (42.2)	26 (40.0)
Age		
≤1 month	18 (11.7)	14 (77.8)
1 month < 5 years	23 (14.9)	7 (30.4)
5 - 13 years	83 (53.9)	33 (39.8)
14 – 45 years	19 (12.3)	8 (42.1)

Table 2: Clinical characteristics of 71 tetanus cases seen during 2007-2008.

Clinical feature	Total (%)	D i e d (%)
Presentation		
Spasm	65 (91.5)	
Locked jaw	(34 (47.9)	
Neck rigidity	(53 (74.6)	
Sadonic smile	9 (12.7)	
Nature of spasms		
Strong	64 (90.1)	
Weak	9 (12.7)	
Incubation period		
<7 days	9 (12.7)	5 (55.6)
≥7 days	13 (18.3)	7 (53.9)
Not known	49 (69.0)	22 (44.9)
Presence/history of a wound		
Yes	54 (76.1)	
No	17 (23.9)	
Site of wound		
Lower extremities	47 (87.0)	
Upper extremities	1 (1.9)	
Head and face	3 (5.6)	
Not known	3 (5.6)	
Cause of wound		
Jiggers	9 (16.7)	
All other known causes	17 (31.5)	
Not known	28 (51.9)	
Medicine administered		
Metronidazole only	33 (46.5)	18 (54.5)
Penicillin ± Metronidazole	38 (53.5)	19 (50.0)
Diazepam	71 (100.0)	
Chlorpromazine	71 (100.0)	
Anti-tetanus serum given		
Yes	24 (33.8)	7 (29.2)

The majority of the patients were male, with a male to female ratio of 2:1. Most (58%) of the patients came from Mayuge district and the rest (42%) came from other neighboring districts. The number of cases admitted with tetanus increased with time, with 26 in 2005; 27 in 2006; 41 in 2007 and 60 in 2008.

Most (124 or 81%) of the patients were children aged 13 years or less. The mean age of cases was 13.5 years (range 1 week - 72 years). Neonatal tetanus was reported in 18 (12%) patients. Death occurred in 72 cases resulting in an overall in-hospital case-fatality of about 47%. Death was highest in the extremes of age, with about 78% in the neonates and about 91% in those aged 45 years and above.

For the 71 patients whose case notes were retrieved and analyzed, it was observed that the immunization status of either the child or mother (for neonatal tetanus) was rarely recorded. Other than spasms and neck rigidity which were recorded in 91.5% and 74.6% of the cases respectively, other common signs and symptoms of tetanus were poorly documented (Table 2).

The mean duration of hospitalization for all cases was 17.5 days (range hours – 32 days). For those who died, their mean duration of hospitalization was 1.3 days (range hours- 9 days) and for those who survived it was 7.4 days (range 3-32 days).

A wound as the portal of entry was recorded in 76.1% and it was on the lower extremities in 66.2%. Jiggers as the cause of wounds were reported in 12.6% of the patients. In most of the case notes (66.9%), it was not possible to deduce the possible incubation period. All 71 cases were managed with sedatives and spasmolytics (diazepam and chlorpromazine). All patients were treated with a single antibiotic, either metronidazole alone (33/71 or 47%) or penicillin only (38 or 53%). Twenty four (33.3%) patients also received intramuscular anti-tetanus immunoglobulin in standard doses. The relatives of 11 of the patients requested to take them home before official discharge. Their outcomes were unknown.

Discussion

This study conforms to observations that tetanus is still a significant cause of preventable death in developing countries. The observed mortality rate of 47% did not differ much from other developing countries which have reported rates between 17.8% and 64% (WHO 2001, Thwaite et al 2003). The mortality may have been higher but 11 patients were taken by their relatives before recovery hence their outcome was not known. This hospital like many others in the region does not

have intensive care (ICU) facilities and hence patients are managed on the general medical and pediatric wards.

The number of cases registered in the hospital is high compared to other studies in African countries. There was an average of 3 cases per month compared to Ramos and Sanja who found 1/month and 2/month respectively (Sanya et al., 2007; Ramos et al., 2008). However a similar study in the same hospital 20 years ago had an average of 6 cases per month (Kawuma et al., 1992). This decline may be partly attributed to the Expanded Programme on Immunization (EPI) whose performance has improved progressively after special efforts by the Ministry of Health (MoH). This region was earmarked in 2002 by the MoH as being at high risk for neonatal and maternal tetanus and offered supplemental programmes towards elimination of tetanus (MoH, 2002).

Only 6 (20%) among 30 adult patients above 13 years were females. Neonatal tetanus contributed 12% of tetanus cases compared to what was noted earlier where 80.2% of all tetanus admissions were neonates (Kawuma et al., 1992; MOH, 2002). This significant difference may be partly attributed to the success of specific programmes that continue to target tetanus immunization among females in the reproductive age group and those who are pregnant.

Children below 13 years contributed 81% of all the cases with majority aged 5-13 years (54%). This confirms that tetanus is still a childhood disease and the high proportion among children may partly be a reflection of inadequate primary immunization coverage. It's believed that tetanus can be eradicated from the world but this is less realistic in developing countries where immunization services are not widely available, essential vaccines are often out of stock, cold chain integrity not guaranteed and occasional mistrust about vaccines especially in the rural communities. It is important to ensure that the immunization programme is effective because the absence of an effective immunization programme leads to loss of young lives and wastage of scarce resources. In Nigeria it was found that the average cost of treating 5 tetanus patients with mean hospitalization in ICU of 10 days was US\$ 363.24 (Ahmadsyah et al 1985). This is extremely high compared to the cost of the vaccine.

Trivial wounds on the lower limbs as possible portals of entry for tetanus infection are common because most people in the rural areas do not wear shoes. Also, lack of proper wound care and some cultural practices for wound care may increase the chance of acquiring

tetanus infection. It is not surprising that 12% of patients had jiggers as the cause of the wounds.

Although this study was not designed to evaluate the effectiveness of the two medicines in the treatment of tetanus, metronidazole does not seem to have led to better chances of survival compared to Penicillin (50% and 55%). However, this finding needs to be interpreted with caution. The use of anti-tetanus immunoglobulin (ATS) is known to reduce mortality in tetanus cases especially if used intrathecally (Barros et al., 2004). Only 24 (33.3%) of the 71 cases received ATS, mainly because it was not readily available due to its cost. Though mortality rate was lower in patients who received ATS compared to those who did not (29.2% vs 57.5%), this can not fully be attributed to ATS because the study was not designed to evaluate this effect.

In conclusion, the mortality from this preventable disease remains unacceptably high especially in children. Scaling up of immunization services and addressing of basic principles of primary wound care should be given priority. Demand for tetanus immunization records should be made a must for all children joining school at all levels and for adults at pre-employment. Programmes that aim at helping the entire citizenry access the 5-10 year booster doses need to be planned and implemented.

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