ORIGINAL ARTICLE

The presentation of tetanus in a tertiary health centre in Abakaliki, South-East Nigeria

Chukwuemeka O **EZE**
Neurology Unit, Department of Internal Medicine, Federal Teaching Hospital Abakaliki Ebonyi State, NIGERIA

Author for Correspondence
Chukwuemeka O **EZE**
Neurology Unit, Department of Medicine, Federal Teaching Hospital Abakaliki, Ebonyi State, NIGERIA

Email: drezeconauth@yahoo.com
Phone: +234 703 343 2117

Received: June 30th, 2016
Accepted: September20th, 2016

DISCLOSURES: NONE

ABSTRACT

Background: The presentation and prognosis of tetanus varies amongst different regions of the world and this depends on many factors including the herd immunity and hygienic practices in the regions. Tetanus may be categorized into 4 clinical types: generalized tetanus, localized tetanus, cephalic tetanus and neonatal tetanus.
Objectives: To study the presentation and prognosis of tetanus in a tertiary health centre in Abakaliki, South-East Nigeria, and to compare it with that from other parts of the world.
Methodology: A review of the case notes of tetanus patients managed in the isolation wards of the Federal Teaching Hospital Abakaliki, South-East Nigeria, from June 2013 to May 2015 was done.
Results: The total number of tetanus cases seen over the period was 16, with an age range of 16 to 52years and mean age of 28.07±5.34years. All the patients had generalized tetanus. There were 15(93.75%) males and 1 (6.25%) female. The mean incubation and onset periods were 12.6 days and 2 days respectively. They were treated with intravenous diazepam, metronidazole, tetanus toxoid and anti-tetanus serum. The mean duration of admission was 12.5days and mortality rate was 18.8%. Presence of co-morbid medical conditions was associated with mortality.
Conclusion: The study showed that tetanus affects predominantly young men in their productive years, and the mortality rate is rather high for a potentially preventable disease. More efforts should be put in achieving universal immunization coverage for children less than 5years of age, with regular booster doses for the whole population.

Keywords: *Diazepam, emergency, fatal, preventable, young males*

INTRODUCTION

Tetanus is an acute, often fatal, disease caused by an exotoxin produced by the bacterium, *Clostridium tetani*. It is categorized into the four clinical types: generalized tetanus, localized tetanus, cephalic tetanus and neonatal tetanus.

Tetanus is characterized by generalized rigidity and convulsive spasms of skeletal muscles. The muscle stiffness usually involves the jaw (lockjaw) and neck and then, becomes generalized. It is a medical emergency and remains an important cause of death worldwide, particularly in the developing world. There are estimated

800,000–1,000,000 deaths worldwide from tetanus each year.[1]

In Nigeria, tetanus predominantly affects the young males, and the mortality from adult tetanus ranged between 26% and 60%.[2,3] The Federal Teaching Hospital Abakaliki (FETHA) which serves as the referral centre for Ebonyi and the neighbouring states like Cross-River, Enugu, and Abia, has an isolation ward where tetanus patients are managed.

There has not been any study on adult tetanus in the health facility prior to now, and so, this study takes a look at the presentation and prognosis of adult tetanus at FETHA. The data derived from here will form a reference resource for the centre and also, a comparative data base with other centres in Nigeria and abroad.

METHODOLOGY

This is a retrospective descriptive study. The case records of all patients managed for tetanus at the isolation medical ward between June 2013 and May 2015 were identified from the ward register. The folders were retrieved from the Medical Records Department of FETHA and analyzed. Also, the total number of patients admitted in other medical wards over the same period was noted from the registers of the wards. Socio-demographic parameters and clinical information such as the age, sex, portal of entry, incubation period, period of onset, duration of hospital stay, average daily dose of diazepam and management outcome were extracted from the folders.

The diagnosis of tetanus was based on the presence of, at least 2 of, the following clinical features:

a. Trismus with or without *risus sardonicus*
b. Rigidity of the abdominal wall and/ or cervical muscle
c. Reflex spasm (spontaneous and/ or provocative)

The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 19 software. The qualitative data were expressed as frequencies and percentages, while quantitative data were summarized as means and standard deviations. The continuous variables were compared by the Student *t*-test while the proportions were analyzed with the Fisher's Exact Test. A *p*-value of <0.05 was regarded as statistically significant.

RESULTS

Out of the 2352 patients admitted over the study period, 16 were diagnosed with tetanus, constituting 0.68% of the total medical admissions. The age range was 16 to 52years with mean age of 28.07±5.34years. Fifteen (93.75%) patients were males while only a female (6.25%) was seen over the period. The details of the age and sex distribution are reported on Table 1. The range of incubation period was 4 to 21days with a mean of 12.6days, while the range of onset period was 1 to 4 days with a mean of 2days. The mean admission duration was 12.45days. They were treated with intravenous diazepam, metronidazole, tetanus toxoid and anti-tetanus serum. The mean daily intravenous diazepam dose was 120mg.

Table 1. Age and sex distribution

Age Range (years)	Male n (%)	Female n (%)	Total n (%)
10-19	3(18.75)	0(0)	3(18.75)
20-29	8(50.00	1(6.25)	9(56.25)
30-39	1(6.25)	0(0)	1(6.25)
40-49	0(0)	0(0)	0(0)
50-59	3(18.75)	0(0)	3(18.75)
Total	**15(93.75)**	**1(6.25)**	**16(100)**

Three male patients died with a case fatality rate of 18.75%, while 13 patients were discharged home without any disability. The mean age of the dead is 33.3years and for the survivors 27.8years. Also, the mean admission duration for the dead was 3days and for the survivors 14.63days. The presence of co-morbid medical conditions is associated with increased mortality. Ten

(62.5%) patients had portal of entry of the disease on the lower limbs. Other details were recorded in Table 2.

Table 2. Clinical variables

Variable	Survived	Dead	P-value
Sex: Male	12	3	1.00
Female	1	0	
Age: <40yrs	112		0.49
≥40yrs	2	1	
Portal of entry			
Lower Limb	91		1.00
Upper Limb	31		
Trunk	1	1	
Incubation Period			
<2 weeks	5	1	1.00
≥2 weeks	8	2	
Onset Period			
≤ 2 days	7	2	1.00
> 2 days	6	1	
Admission duration			
<2 weeks	6	3	0.21
≥2 weeks	7	0	
Comorbidity			
No	13	1	0.025
Yes	0	2	
Mean Age (Years)	27.77	33.33	
Mean Incubation Period (days)	12.25	14.0	
Mean Onset Period (days)	2.375	1.33	
Mean Admission Period (days)	14.63	3.0	

DISCUSSION

Tetanus is a medical emergency. Its prevalence has reduced significantly even in developing countries due to high tetanus immunization coverage. Sixteen (16) cases of tetanus were seen over a two-year period in this study. They were all managed in the isolation ward of the hospital and they accounted for 0.68% of total medical admissions. This closely approximates to, though less than, the 1% reported in Port Harcourt, Nigeria from 1996 to 2005, and these lowering figures could have been due to the increasing tetanus immunization coverage in Nigeria.[3] This prevalence is higher than the report of Onwuekwe, *et al*, at Enugu, South-East Nigeria about 10years ago.[4] This could have resulted from the fact that Enugu has several tertiary health facilities unlike Abakaliki that has only one tertiary health facility where this study was conducted.

The age range of the tetanus patients in this study was 16-52years with mean age of 28years. This is similar to the report of other similar hospital based studies in Nigeria.[3,4] This finding suggests that tetanus is mainly a disease of the young population. It could result from the higher tendency of the young people to be involved in risky behaviours that could lead to injuries. Also, even when they sustain injuries, they may not seek appropriate medical therapy.

There is a high male preponderance (94%) in this study, which is similar to the reports of other hospital based studies in Nigeria and Ghana.[3,4,5,6] This male preponderance could stem from the higher tendency of the young men to be involved in risky behaviours or occupations that could lead to injuries like drunk driving, and heavy machine operations. Also, lack of much value for girl children, occasioned by culture, could make their caregivers not to bring them to the hospital even in face of a dreaded illness like tetanus.

The incubation period range was 4-21days with a mean period of about 13days while the onset period range was 1-4days with a mean of 2days. This is in keeping with the known incubation period and onset period. The case fatality rate (CFR) was 18.8% and all were males. This CFR is low compared to other hospital based studies which reported CFR of 26-43%.[3,5,7] This could be due to the fact that those studies were reported more than 10years ago when immunization coverage was lower, with the attendant lower herd immunity. Also, the patients reported in this study were all managed in the special isolation ward devoid of excessive noise, light and other factors that provoke spasms while

patients in other studies were managed in general medical wards. In the isolation ward, specially trained nurses with dedicated nursing services bring about better patient care, and attendant improved outcome. Despite the low CFR in this study, it is rather high for a potentially preventable illness.

The mean age of the dead cases (33.3years) was higher than that of the survivors (27.8years) though not statistically significant ($p > 0.05$), which is similar to the report in Port Harcourt about 10years ago.[3] This could have resulted from the fact that older patients have higher risk of having co-morbid factors that may affect the prognosis, and again, the immunity to tetanus derived from tetanus toxoid immunization wanes as age increases. The older patients may have had a lower immunity.

The mean admission duration for the survivors (14.6days) was higher than that of the dead patients (3days). This suggests that death occurs within a few days of presentation and could have been influenced by the severity of the illness. This is in keeping with the report of Onwuchekwa, *et al*.[3] The presence of co-morbid conditions like seizure disorders, burns and myelopathies were significantly associated with increased mortality. This is expected owing to the additive effect of the morbidity associated the diseases.

Most of the patients had portals of entry on their lower limbs, and this corroborates the reports from other hospital based studies.[3,4] This preponderance is multi-factorial. Possible explanations include walking bare foot, not recognizing subtle injuries in the lower limbs and the higher use of lower limbs in injury prone activities.

CONCLUSION

Tetanus affects predominantly young men in their productive years, and the mortality rate is rather high for a potentially preventable disease. More efforts should be put in the aspect of achieving universal immunization coverage for children who are less than 5years of age and also, in ensuring regular booster doses for the whole population.

REFERENCES

1. Dietz V, Milstien JB, van Loon F, Cochi S, Bennett J. Performance and potency of tetanus toxoid: implications for eliminating neonatal tetanus. *Bull WHO* 1996; 74: 619–628.
2. Bandele EO, Akinyanju MO, Bojuwoye BJ. An analysis of tetanus deaths in Lagos. *J Natl Med Assoc* 1991; 83:55-58.
3. Onwuchekwa AC, Asekomeh EG. A 10-year review of outcome of management of tetanus in adults at a Nigerian tertiary hospital. *Ann Afr Med* 2009; 8:168-172.
4. Onwuekwe IO, Onyedum CC, Nwabueze AC. Experience with tetanus in a tertiary hospital in south east Nigeria. *Niger J Med* 2008; 17(1):50-52.
5. Ojini FI, Danesi MA. Mortality of tetanus at the Lagos University Teaching Hospital, Nigeria. *Trop Doct* 2005; 35:178-181.
6. Hesse IF, Mensah A, Asante DK, Lartey M, Neequaye A. Adult tetanus in Accra, why the high mortality? An audit of clinical management of tetanus. *West Afr J Med* 2005; 24:157-161.
7. Ogunrin OA, Unuigbe EI. Tetanus: an analysis of the prognosticating factors of cases seen in a tertiary hospital in a developing African country between 1990 and 2000. *Trop Doct* 2004; 34:240-241.