

Maternal Tetanus at the University College Hospital in Ibadan Nigeria: A 15-Year Retrospective Analysis

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Objective To determine the characteristics of women with maternal tetanus, pattern of presentation and outcome of management.

Methods A total of 19 women were managed with maternal tetanus between 1990 and 2005 from the University College Hospital in Ibadan Nigeria. A retrospective study was performed. The medical records of all women managed as a case of maternal tetanus were retrieved from the central record department of the hospital. The pattern of presentation, characteristics of women, the duration of hospital admission, tetanus toxoid immunization, and outcome of care were measured.

Results The records of 18 women managed were analyzed. The mean age at presentation was 25.2 ± 5.3 years. The patients were mostly single, nulliparous and had primary school education. The maternal tetanus cases seen mainly complicated induced abortion while 5 and 2 other cases were due to childbirth complication and leg wound respectively. The portal of entry of the remaining 3 cases could not be ascertained. None of the patient managed had complete immunization schedule. The average duration of admission was 11.2 ± 6.7 d. Five women had intensive care with 3 of them requiring ventilatory support. The case fatality rate was 66.7%. The only factor that significantly improved survival was presence of generalized spasm at presentation ($P=0.006$)

Conclusion The occurrence of maternal tetanus is a reflection of low quality of health care delivery and lack or inefficient routine immunization coverage in any community.

Key words: maternal tetanus; Nigeria; maternal mortality

Tetanus is one of the public health problems that have suffered neglect and it is still ravaging most developing countries including Nigeria^[1]. Although, morbidities and mortalities have drastically reduced over the years following the discovery of vaccine and its use in many countries^[2,3]. The strategic implementations of tetanus immunization programme have not received the expected priority^[3]. As such, sporadic presentation of tetanus in many of these communities still exists till today. However, countries such as Bangladesh, North and South Korea have virtually prevented the disease due to their proactive attitude towards immunization in the last 5 decades^[4,5].

Tetanus contributes to maternal mortality figures in Nigeria despite the huge resources that government at all level contributes to routine immunization^[6]. Maternal tetanus is defined as tetanus occurring during pregnancy or within 6 weeks after termination of pregnancy^[6]. It therefore includes antepartum, postpartum/puerperal and post-abortal patterns. The inoculation of the uterus or any other parts of the genitals with tetanus spores result from unhygienic delivery practices and unsafe abortion. Once the spores are in a wet, poorly oxygenated, necrotic tissue, such as a piece of retained placenta, it germinates and begins to produce the neurotoxin tetanospasmin. Sometimes, the portal of entry may not be noticeable especially those that present while pregnant. The toxins then spread along the neural pathways to the spinal cord and the central nervous system, where it affects a number of vital functions. As such, the affected women present with symptoms depending on the severity and in many cases there may be the need to offer ventilatory support.

Although, there have been difficulty in determining the prevalence of tetanus amongst women of reproductive age group in Nigeria, but most data available were grouped with adult tetanus generally^[6]. Attempts have been made to extrapolate from available community studies to determine the number of deaths due to maternal tetanus and this was put to be at least 15 000–30 000 per annum worldwide^[6]. About 5 decades ago, Johnstone reported that 20 % of adult tetanus seen in Ibadan over a period of 10 years was due to maternal tetanus and majority occurred following induced abortion^[7]. Similar findings were reported in Lagos and Zaria^[8,9].

The principle of management of maternal tetanus is the same as in any other patient except the portal of entry. The goals of management include control of spasm, neutralization of the unbound antitoxin, elimination of the toxins source by using antibiotics (metronidazole and penicillin) and cardio-pulmonary support^[6]. Most times moderate to severe tetanus will need to be managed in the intensive care unit and as such will require huge resources (manpower and finances). In cases of postpartum and post-abortal tetanus, dilatation and curettage are necessary to remove the necrotic tissue and retained product of conception which form the nidus of infection.

Despite the various efforts at effectively managing cases of maternal tetanus reported, the case fatality rate in Nigeria was still 20%–70%^[3,6].

There is therefore the need to critically review again the outcome of cases of maternal tetanus over the years with a view to providing insight into the policy/implementation strategy of tetanus immunization among women of reproductive age.

The aim of this study was to survey the outcome of cases of maternal tetanus managed over a 15-year period by determining the characteristics of victims and the pattern of tetanus with the portal of entry and also, to ascertain the outcome of those managed.

Materials & Methods

Materials

This was a retrospective study conducted at the University College Hospital in Ibadan, Nigeria on women that were managed for maternal tetanus over a 15-year period (1990–2005). The medical records of women who had a coded diagnosis of tetanus were retrieved from the hospital central records department after obtaining the approval of the University of Ibadan/University College Hospital, Ibadan ethical review board.

The data obtained include socio-demographic profile (age, educational status, religion, marital status and parity) and clinical parameters (clinical presentation, likely portal of entry, duration of hospital care including intensive care management and outcome).

Statistical analysis

The data were analyzed using SPSS11.0 software package. Bivariate analysis was performed using Chi-square and Fischer's exact test. The level of statistical significance was set at $P < 0.05$.

Results

Eighteen out of 19 cases of maternal tetanus managed between 1990 and 2005 were retrieved for analysis. This gave a retrieval rate of 94.7%. The mean age of the women was 25.2 ± 5.3 years. Two thirds of the women had up to primary school education. There were 10 (53.6%) Muslims and 8 Christians (44.4%). Two thirds of the women were single, 5 (27.8%) were married and 1 (5.6%) divorced (Table 1).

The presenting symptoms included: localised spasms seen in all the women; generalised spasms (38.9%); fever (83.3%), vaginal discharge (50.0%); respiratory embarrassment (38.9%). Three of the women (16.7%) were pregnant at presentation.

The most likely portal of entry was postabortal in 8 (44.4%) of the women, puerperal in 5 (27.8%), leg wound in 2 (11.1%) and unknown in 3 (16.7%) of the women (Table 1).

There was evidence of previous tetanus immunization in only 3 (16.7%) of the women. Among this number, 1 had 2 doses while the other 2 had a single dose each of tetanus toxoid?.

The 3 of the women presented in pregnancy. Of these, 2 had live birth at 35 and 37 weeks,

4 and 5 weeks respectively after admission while the third presented with intrauterine fetal death together with tetanus at 32 weeks gestation and subsequently delivered vaginal by uterine stimulation using misoprostol after the acute phase management of tetanus.

The women were on admission for a mean duration of 11.2 ± 6.7 d. Five (27.8%) of the women required intensive care unit (ICU) care and they were there for a mean duration of 3 d. Three (16.7%) of the women in ICU were on ventilator for a mean period of 2.5 d. Twelve of the women died giving a case fatality rate of 66.7%.

The number of maternal tetanus cases seen was quite few during the study period and no significant associations were found between patient characteristics and outcome of management. However, better survival rates were found in: older women, the less educated, single, parous, women with previous abortions with post-abortal portal of entry and women that were not pregnant, but this association were not statistically significant.

There was significantly better survival in patients who had generalized spasms ($P=0.006$) (Table 2).

Table 1 Sociodemographics

Variable	Categories	Number in categories (n=18)	%
Age (years)	17-24	8	44.4
	25-37	10	55.6
Educational status	Primary	7	38.9
	Secondary	4	22.2
	Tertiary	2	11.1
	None	5	27.8
Religion	Islam	10	55.6
	Christianity	8	44.4
	Yoruba	12	66.7
Tribe	Hausa	2	11.1
	Igbo	4	22.2
	Single	12	66.7
Marital status	Married	5	27.8
	Divorced	1	5.6
Parity	Nulliparous	11	61.1
	Primiparous	5	27.8
	Multiparous	2	11.1
	Postabortal	8	44.4
Likely portal of entry	Puerperal	5	27.8
	Wound	2	11.1
	Unknown	3	16.7

Table 2 Relationship between survival and patient characteristics

Variable	Categories	Survived(%)	Number in categories (n=18)	P*
Age (years)	≤ 24	25.0	8	0.638
	>24	40.0	10	
Education	≤ Primary	41.7	12	0.600
	≥ Secondary	16.7	6	
Tribe	Yoruba	33.3	12	1.000
	Others	33.3	6	
Marital status	Single	41.7	12	0.600
	Married	16.7	6	
Parity	Nulliparous	27.3	11	0.627
	Others	42.9	7	
Previous abortions	Yes	30.8	13	1.000
	No	40.0	5	
Likely portal of entry	Post abortal	50.0	8	0.321
	Others	20.0	10	
Generalized spasms	Yes	71.4	7	0.006
	No	9.1	11	
Gravid at presentation	Yes	0.0	3	0.515
	No	40.0	15	

*: P value based on Fisher's exact test at 5% level of significance

Discussion

The occurrence of maternal tetanus within any community is a reflection of the level of tetanus passive immunity amongst women and children^[5,10]. Fauveau, *et al.* reported that Nigeria accounted for a third of the 1 101 maternal tetanus cases reviewed between 1958 and 1990 in all developing countries (Asia and Africa) despite the various immunizations programmes in place^[6].

From this study, the sociodemographic profiles of patients managed within the 15-year period were similar with the previous studies^[6-9]. It is most likely that a sizeable proportion of women do not have access to tetanus immunization. These women probably do not patronize orthodox medical practitioners during pregnancy but engage the services of mission homes or traditional birth attendants. Others fail to complete their immunization schedule due to poverty or scarcity^[3,11,12]. The finding from our study, that none of the patients that had maternal tetanus completed the tetanus immunization schedule is a testimony.

Another major drawback of the tetanus immunization programme in most developing countries identified by WHO was that adolescent girls who are mothers of tomorrow and that are more likely to engage in unsafe abortion are not usually included in routine immunization schedule^[3,13,14]. This leaves about 30% of women population unattended to. It is therefore not surprising that majority of those with maternal tetanus in this review were single

and nulliparous women who had maternal tetanus as a complication of an induced abortion.

The WHO in conjunction with UNICEF then suggested that routine tetanus immunization should be incorporated into the school curriculum so that at the end of their secondary schools or their first pregnancy they should have had four doses of tetanus toxoid^[13,15]. This will offer immunity for at least 20 years.

The pattern of clinical presentation of patients managed revealed that a third had severe manifestation of the disease (respiratory difficulty) that warranted intensive care admission. This type of presentation has been reported by various studies to be associated with poor prognosis^[6,16]. Expectedly, the case fatality rate was 66.7% from this study which was higher than 16% reported in Cape Town^[17]. It is obvious from this review that prevention rather than aim to cure the disease should be the goal because any maternal death within a health institution is regarded as 100 % loss to her family.

Notwithstanding the small sample size and failure of statistical significance, some observations can still be made. Contrary to the previous studies we found that older women and those with no formal education up to primary level survived better than others^[6,16]. This observation may be due to the small size of the subjects studied. In addition, we also found out that women with generalized spasm survived better. This may be due to the fact that such patients are offered intensive care service from admission with facility for ventilation support.

This study shows that maternal tetanus can still complicate labour and induced abortion especially when conducted in an unhygienic environment and it often results in mortality. It is therefore imperative that serious effort must be made to ensure adequate coverage of tetanus immunization among adolescents through awareness creation, policy implementation and at the same time reducing unhygienic practices that may precipitate infection including the avoidance of unsafe abortion.

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