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Neonatal Tetanus are we winning the war?

ABSTRACT

Aims: To determine if we are winning the war against deaths from Neonatal tetanus.

Study design: Retrospective descriptive study

Place and duration of study: Department of Paediatrics, University of Port Harcourt Teaching Hospital between 1995 to 2014.

Methodology: Hospital records on Neonatal tetanus cases treated at the University of Port Harcourt Teaching Hospital were reviewed. The records were retrieved and reviewed for age, sex, presenting complaint, mothers immunization status, examination findings, duration of hospitalization and outcome of illness.

Results: Three hundred and thirteen neonates comprising 182 (58%) males and 129(41%) females were treated, 2(0.006%) did not have any record of their sex. Most of the mothers were unimmunized and delivered outside health facilities. Fifty-one percent of the newborns with neonatal tetanus in this study died. There was not much difference in the number and characteristics of the cases over this period.

Conclusion: There appears to be an upward trend in mortality of Neonatal tetanus cases as the last review of neonatal tetanus in UPTH in 2009 gave a mortality of 50% and as such we are not winning the war the battle rages on. This review was a comprehensive one from 1995-2014, but data for 2009-2014 gave a mortality of 68.75% while the previous review of 1995-2009 gave a mortality rate of 50%.

Key words: *Neonatal tetanus mortality winning the war***.**

1. INTRODUCTION

Tetanus is a devastating disease in the neonatal period. Infection mostly results from unhygienic birth practices that expose the umbilical cord to the tetanus organism: Clostridium tetani [1].

The neonatal period represent the most vulnerable time for a child's survival. Global neonatal mortality rate in 2013 was estimated to be 20 per 1000 live births and that 2.8 million babies die before 28 days [2]. Neonatal tetanus (NNT) though a preventable disease has remained a major cause of morbidity and mortality among neonates worldwide. Global evidence has revealed tetanus as the highest mortality contributor among children after measles in vaccine preventable diseases [3]. Neonatal tetanus kills a baby every 9minutes [4]. WHO estimated that 49,000 newborns died from NNT in 2013[5]. Low income countries such as Nigeria and India account for most of the deaths from NNT [6]. Over all, in Nigeria tetanus is responsible for 4% of the neonatal deaths [7]. The percentage of neonatal deaths caused by tetanus varies considerably in various states in Nigeria with the highest of 19% reported in Yobe state and the lowest of 1% in Ekiti, Lagos and Osun States [8]. In Rivers state, neonatal deaths caused by tetanus was 3%[8].

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The prevalence of neonatal tetanus has remained high in many developing countries because a high proportion of deliveries still take place at home or in places where hygienic condition may be poor. In Nigeria, the percentage of deliveries at home has remained very high, only 36% of births in Nigeria are delivered in a health facility (as compared with 35% in 2008), 63% are delivered at home [8]. Northwest had the highest proportion of deliveries at home with 88% followed by North east 79% and the lowest was South east 20%. In Rivers State 49.6% delivered at home and only 49% in a health facility [8]. Overall, only 38% of deliveries were assisted by a skilled provider, 22% by a traditional birth attendant, 23% by relatives or other persons and 13% unassisted [8].

Elimination of NT was redefined by 1995 as less than one case per 1000 live births in every district in every country. The target date was however postponed to 2000 because of slow implementation of the recommended maternal tetanus elimination strategies, in 1999, it was reviewed by UNICEF,WHO and UNFPA and the initiative was reconstituted with a 2005 target date for maternal tetanus elimination which was later shifted to 2015 [5]. Nigeria today is still one of the high risk countries that have not yet achieved the maternal and neonatal tetanus elimination goal yet [5]. Every case of neonatal tetanus in Nigeria indicates a major failure of public health practice because it can be completely prevented by immunizing females before or during pregnancy, ensuring clean delivery, clean severance of the umbilical cord and proper care of the cord after delivery. Immunisation of pregnant women or women of child bearing age (15-49years) with at least 2 doses of tetanus toxoid is estimated to reduce mortality from NNT by 94% [6]. The percentage of women who received 2 or more tetanus toxoid (TT) injection during their last pregnancy was 48% and 53% of women had their last birth protected against neonatal tetanus [8]. The proportion of these women who received 2 or more TT injection during the pregnancy for their last live birth varies considerably across zones ranging from a high of 82% in Southeast to a low of 27% in the Northwest. In Rivers state, 76.5% of women received 2 or more TT injections during their last pregnancy and the percentage of women whose last birth was protected against neonatal tetanus was 80.3% [8].

Unfortunately, the unnecessary deaths caused by this highly preventable disease has continued in most developing countries including Nigeria despite the availability of effective preventive measures. In 1998 in Uganda, 3433 tetanus cases were recorded in newborns, of these 2043 died but after a major public health effort Uganda in 2011 was certified as having eliminated tetanus [9]. In Nigeria it is possible to eliminate tetanus with sustained public health effort.

This study therefore aims to review the trend and outcome of neonatal tetanus in University of Port Harcourt from 1995 to 2014 with a view of highlighting the morbidity and mortality status over the study period and continued existence of neonatal tetanus and as such highlight possible ways to achieving maternal tetanus elimination.

2. MATERIALS AND METHOD

The cases of neonatal tetanus managed in University of Port Harcourt Teaching Hospital from 1995 to 2014 was reviewed. All cases were diagnosed by Paediatricians using the clinical features of the disease. Details obtained included socio demographic data of patients, presenting complaints, history of the illness , onset interval , incubation period, mother's immunization status, examination findings, management, duration of hospitalization and outcome of illness. All cases were admitted into the tetanus side room of the children's ward. They all received anti tetanus serum (ATS), IV antibiotics and spasms were controlled with a combination of phenobarbitone, chlorpromazine and diazepam.
Data was analysed using SPSS 20.0 and presented using simple frequencies and in tables.

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3. RESULTS

A total of three hundred and thirteen cases of neonatal tetanus were managed in UPTH over the study period. All cases of neonatal tetanus were studied. There were 182 (58.2%) males and 129(41.2%) females (M:F 1.4:1) and 2(0.006%) did not have any record of their sex. Table 1 shows the demographic characteristics of the cases and outcome.

Table 1: Demographic characteristics of cases and outcome

Characteristics	Cases studied		Outcome					
			Survival		Parental discharge		Death	
	Total	Percent	Total	Percent	Total	Percent	Total	Percent
Sexes								
Males	182	58.2	54	29.6	23	12.6	93	51.1
Females	129	41.2	35	27.1	16	13.2	68	52.7
Sex not indicated	2	0.006	1	50				

The age distribution of cases ranged from 2-28days with mean age of 7.82 ± 3.26. Data on the outcome of 22 children was missing (7.0%), 90(28.8%) of children survived , 39(12.5%) were either discharged against

medical advice or absconded from the hospital while 162(51.7%) died. Table 2 shows the yearly distribution of cases and case fatality rates per year.

Table 2: Yearly distribution of cases and fatality rates

Year of admission	Total No of cases	No of deaths	Case fatality rate(%)
1995	**29**	**17**	**58.6**
1996	**15**	**9**	**60.0**
1997	**42**	**22**	**52.4**
1998	**50**	**28**	**56.0**
1999	**21**	**10**	**47.6**

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2000	**43**	**24**	**55.8**
2001	**31**	**15**	**48.4**
2002	**NIL**		
2003	**15**	**3**	**20.0**
2004	**NIL**		
2005	**26**	**9**	**34.6**
2006	**9**	**4**	**44.4**
2007	**5**	**3**	**60.0**
2008	**2**	**1**	**50.0**
2009	**10**	**8**	**80.0**
2010	**2**	**1**	**50.0**
2011	**2**	**1**	**50.0**
2012	**4**	**2**	**50.0**
2013	**2**	**2**	**100.0**
2014	**1**	**1**	**100.0**

The annual case fatality rates showed no consistent pattern, the percentage of deaths ranged from 20% in 2003 to 100% in 2013. The duration of hospitalization ranged from a few days to 35days or more. The earliest recovery time was 7 days during which period only 5(1.6%) children recovered, most deaths occurred within the first 7days. 46(14.6%) of mothers received ANC in a health facility. Most deliveries were outside a health facility, the place of delivery was however not indicated in most of the records (166:53%), only 29(9.2%) delivered in a health facility, 69(22%) in a TBA's home or at home, 47(15.0%) in a prayer house. Data on cord care for 204(65.1%) patients was missing, cord care with methylated spirit was done by 54(17.2%), 59(18.8%) used Robb, 17(5.4%) Vaseline, 8(2.6%) herbs. The immunization status of the mothers was largely unknown with 20(6.4%) claiming to have received 1 dose of TT and 28(8.9%) received two or more doses of TT. Among these patients, 40.0% and 60.7% respectively died thus receiving at least a dose of TT increases the chances of survival. The educational

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status was not indicated in most of the records (213: 68%), 39(12.4%) had primary education, 60(19.1%) had secondary education and 1 (0.3%) had tertiary education.

4. DISCUSSION

There were more males than females in our study with male: female ratio of 1.4:1, this is similar with the report from other studies in Nigeria [10,11].The reason for this finding is not clear but may partly explained by the preference given to the male child in the society that makes parents to seek for medical attention promptly. This contrasts with the study by Babatunde et al [12] and Peterside et al [13] who reported more females than males with neonatal tetanus in Ado-Ekiti and Bayelsa respectively. Emodi et al [14] in Enugu however reported equal sex ratio among patients with neonatal tetanus.

The findings in our study have shown that neonatal tetanus has remained a major cause of morbidity and mortality in Nigeria despite over two decades of commitments by the public health community globally to the elimination of tetanus. In this review, a high proportion of women delivered outside a health facility, only 5.1% delivered in a hospital and 4.1% in a maternity this is similar to the report by other authors in Nigeria [11,15].

Most of the mothers were unimmunized or incompletely immunised and this may be attributed to the fact that very few mothers (14.6%) received antenatal care in a health facility which corroborates with other studies in Nigeria [12,15]. Most mothers in our study had low level of education, 19.1% completed secondary school and 0.3% post-secondary education which has been a consistent finding by most authors in Nigeria [1,16-18]. Osaghae et al [1] in his study illustrated that there was a vicious cycle of low level of maternal education contributing to lack of antenatal care, low immunization, delivery outside a health facility, poor cord care and other risk factors for neonatal tetanus. These prevalent conditions have persisted for several years and are the reasons for continuous existence of NNT in Nigeria thus indicating that not much impact has been made in terms of combating this preventable disease and therefore a pointer to the failure of our health care system. In developed countries with better female education, adequate vaccination coverage and neonatal care, the numbers of cases of neonatal tetanus reported were rather small when compared to developing countries [6,19].

The case fatality rates noted in this review showed that there appears to be an upward trend in the mortality rates of neonatal tetanus in the recent years though the number of cases in the recent years reduced; from the previous review between 1995-2009, the mortality rate was 50% while in the recent years between 2009, the mortality rate increased to 68.75% and as such we are not winning the war the battle rages on. The mortality rate in this review falls within the range of 30-70% mortality found by other workers in Nigeria [12-15]. This calls for a reappraisal of our control programme on tetanus in Nigeria. The majority of the mortalities in our review occurred within the first seven days of admission, this is consistent with the findings in other studies in Nigeria [13,15] suggesting that the first week of hospitalization is a critical period.

5. CONCLUSION/RECOMMENDATION

There is an upward trend in the mortality of tetanus suggesting a failure in the health system in combating neonatal tetanus. There is need to promote female education and increase the level of public awareness on tetanus and the associated risk factors. Immunisation campaigns for women of child bearing age (15-49years) should be strengthened. The health facilities should be made more accessible and affordable

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pregnant mothers and neonates by offering them free or subsidized health care services. We can borrow a leaf from Uganda public health effort in achieving tetanus elimination in Nigeria.

6. LIMITATIONS

There were repeated strikes by the health workers in 2014 which may have been the reason why only one case of neonatal tetanus was recorded in 2014 as most cases would have presented to private health facilities to seek medical care. Poor record keeping system in our hospital resulting in a lot of missing data and the values used in this study are actually an underestimate of the true picture.

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