

Perception of Tetanus Toxoid Immunization among Women in a Niger Delta Community, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. All authors were involved in the design of the study. Authors GM and EOA performed the statistical analysis, wrote the protocol, wrote the first draft of the manuscript and managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJTDH/2017/32391

Editor(s):

(1) Thomas I Nathaniel, Department of Biomedical Sciences, School of Medicine –Greenville, University of South Carolina, Greenville, USA.

Reviewers:

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Complete Peer review History: <http://www.sciencedomain.org/review-history/19373>

Original Research Article

Received 24th February 2017

Accepted 25th May 2017

Published 6th June 2017

ABSTRACT

Aims: To assess the awareness and knowledge of tetanus toxoid (TT) immunization among women in Alakahia, a community in Obio/Akpor LGA, Rivers State in the Niger Delta region of Nigeria.

Study Design: This was a cross-sectional descriptive study

Place and Duration of Study: This study was carried out in August 2016 among 276 pregnant women and women who had given birth in the last one year in Alakahia community, Rivers State.

Methodology: A cluster sampling method was used and respondents were recruited and interviewed with a pretested interviewer-administered questionnaire divided in two sections. Section A was on awareness of TT immunization structured from the WHO cluster form for TT immunization and section B was on knowledge of TT immunization. Descriptive statistical analysis was done

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using the Statistical Package for social Sciences (SPSS) version 20.

Results: The study showed a high level of awareness about TT immunization (73%); however, out of the 201 (73%) women who were aware of TT immunization, 158 (78.6%) had poor knowledge of TT immunization and its schedule while 43 (21.4%) had good knowledge of TT immunization.

Conclusion: Women in Alakahia community lack adequate knowledge of TT immunization and its proper schedule. There is need for increased education at the community level on TT immunization even from adolescence. Adequate knowledge will improve TT immunization coverage which will make maternal and neonatal tetanus elimination achievable.

Keywords: Neonatal tetanus; tetanus toxoid; immunization.

1. INTRODUCTION

Adequate awareness and knowledge about NNT and TT immunization, and community participation via hygienic delivery practices among women of childbearing age has ultimately contributed to the elimination of Maternal and Neonatal Tetanus (MNT) in several parts of the world [1]; thus tetanus infection can totally be prevented.

Although tetanus infection can affect any age group, health professionals are more concerned about women of the reproductive age (WRA) group because these women in addition to protecting themselves also protect their unborn babies from the fatal course of the disease in the neonatal period. This double protection is majorly brought about by adequate TT immunization coverage as neonates are protected by the transfer of antibodies against tetanus infection from an adequately immunized mother [2]. As such, neonatal tetanus reflects the magnitude of inadequate or no maternal antibody transfer due to low or no female/maternal immunization [3]. Nevertheless, it is quiet sad that even as little as less than 10% cases and deaths of neonatal tetanus are reported [4].

Clostridium tetani, is the second leading cause of death from vaccine-preventable diseases among children world-wide [5]. Globally in 2010, 1% of all child mortality was due to tetanus and it accounted for more than 270,000 neonatal deaths [6]. The high prevalence of NNT in some regions of the world (especially the Sub Saharan region) contributed to the non-attainment of goal four of the Millennium Developmental Goals (MDGs). An estimate of 130 million neonates are born yearly worldwide and about 3.1% of them die during the neonatal period [7]. About 7% of these deaths are due to NNT infection [8]. In 2013, the World Health Organization reported that 49,000 newborns died of this disease alone

[9]; this was a 94% decline in the situation due to international and regional efforts [1].

Tetanus kills one newborn every eleven minute or approximately 134 babies every day [4]. A significant number of women also die every year due to maternal tetanus [9]. Most of these deaths occur in Africa and in East and Southern Asia among populations with limited or no access to health care services and information related to safe birthing practices, with poor socio-economic status and low literacy rate [9].

In Sub-Saharan Africa, NNT is still problematic and is one of the major cause of death among neonates irrespective of a decline globally [4]. Few available studies in the 90s on NNT reported over 120,000 cases and about 93,000 deaths [4]. In 1999, the incidence of NNT in Congo, Ethiopia, Tanzania, Malawi and Niger was in the range of 2-9/1000. In 2004, NNT caused about 130,000 deaths in the neonatal period and it is implicated in about 110,000 neonatal deaths in Africa yearly [4].

Nigeria amongst 27 other countries contributes to 90% of the worldwide burden of the infection [10]. Out of the five million babies born annually in the country, 240,000 (4.8%) die within the first 4 weeks of life and tetanus accounts for up to 20% of these deaths with an incidence of 14.6-20/1000 [11].

Despite remarkable achievements towards elimination and prevention of Maternal and Neonatal Tetanus (MNT), Nigeria still remains among the 19 countries yet to achieve the World Health Organization's (WHO) 2015 NNT elimination goal [1]. It is of more concern to know that in Rivers State, from 1995 till date, 114 cases of post neonatal tetanus, and 313 cases of NNT have been reported [2]. Also studies in this part of the world however have shown that most women do not have adequate knowledge about

TT immunization and this has hampered the achievement of elimination [12-14].

Five doses of TT immunization has been recommended by WHO for WRA group to protect against NNT and to proffer life-long immunity to these women and the level of protection against tetanus is increased at each subsequent dose [15]. In an effort to achieve this as well as MNT elimination in Rivers State, three phases of a maternal and neonatal tetanus elimination campaign were launched in Rivers State from 2009 to 2010 [16]. With these campaigns that have been carried out in Rivers State, it was worthwhile to assess the awareness and knowledge of TT immunization among women in Alakahia, a community in Rivers State in the Niger Delta region of Nigeria. This assessment helps in laying bare areas of deficiency in their knowledge of TT immunization which will help healthcare providers give specific answers and necessary information about TT immunization. It also adds to the data base on the knowledge and awareness about TT immunization in Africa at large.

2. MATERIALS AND METHODS

2.1 Study Area

This study was carried out in a semi urban community located at Alakahia in Obio/Akpor Local Government Area in Rivers State, in the Niger Delta Area of Nigeria. Alakahia shares boundaries with Rumuekini community to the north, Choba community to the south, Rumualogu community to the east and Aluu community to the west. The University of Port Harcourt Teaching Hospital (UPTH) is located within the community where several cases of post neonatal and NNT have been reported [2]. Members of the community are of the Ikwerre tribe. There are four major families in the community which are Rumudike, Rumuodimaya, Rumulugbo, and Rumuosogwu, and they live amongst themselves. Alakahia community is laid out in orderly streets and clearly delineated compounds in some areas and there are four main streets namely: NYSC, Alogu, Mgbuike and Rumualogu. Household listing obtained from the National Population Commission, showed that there are about 670 households [17]. Women are mostly house wives and petty traders, and few of them are civil servants. Pregnant women go for antenatal visits at UPTH, Aluu health centre and private clinics.

2.2 Study Population

Study population included women who had given birth in the last one year and all pregnant women in Alakahia community irrespective of their gestational age.

2.3 Study Design and Sampling

This study was a cross-sectional descriptive study and participants were recruited using a cluster sampling method. A prevalence rate of 10.1% (WRA who had received at least a dose of TT immunization during ante natal care) [13] and a cluster design effect was used. Margin of sampling error tolerated was set at 5% at 95% confidence.

2.4 Sampling Method

A cluster sampling method was used. Data was collected using an interviewer-administered questionnaire structured from the WHO cluster form for TT immunization [18]. The study area was grouped into four clusters using the four main streets as a frame, and numbers 1 to 4 were assigned to each cluster. The cluster from where participants were recruited was randomly selected by balloting and the household to start recruiting participants from was randomly selected by locating the geographical centre of each cluster, which was the market square; and a bottle was spun and the direction where the mouth of the bottle faced when it stopped spinning was chosen as a start off point. All the houses from that direction were sampled and these women recruited consecutively until the sample size was met. Ten to fifteen respondents were recruited every day.

2.5 Data Collection

The study was carried out over 4 weeks in August 2016. Two research assistants were trained by the researcher on how to administer the questionnaires. Respondent's homes were visited mostly in the evenings when members of the house-holds and respondents would be at home.

Data was collected using a pretested interviewer-administered questionnaire; section A was on awareness of tetanus and TT immunization structured from the WHO cluster form for TT immunization [18], section B was on knowledge about TT immunization.

2.6 Data Analysis

Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 20. Socio-demographic and other variables were presented as frequency tables. A simple two grade rating scale was derived from the multi-choice questions which were used to assess knowledge. On a scale of 1 to 10, participants that scored 6-10 were rated as good and those scored 5-1 were rated as poor.

3. RESULTS AND DISCUSSION

3.1 Socio-demographic Characteristics of Respondents

This study was carried out among 276 women in Alakahia. Two-hundred and seventy-six (100%) questionnaires were retrieved from participants.

Majority of the women (75%) were between 31 to 40 years; 61 (22.1%) were aged 21 to 30 years and 50 of the women (8%) were above 40years with a mean age of 36.36 ± 4.38. Two hundred and seventy-three women (98.9%) were married while only 3 women (1.1%) were single. Most of the women had three children (29.3%), 65 of them (23.6%) had four children while 50 of the women (18.1%) had more than four children. One hundred and thirty-nine of the women (50.4%) had secondary level of education, 68 of them (24.6%) had tertiary level of education while 69 (25%) had primary level of education. Majority of their husbands (57.6%) had completed secondary education, 58 (21%) had primary education, 40 (18.5%) had tertiary education while 19 (6.9%) had no formal education.

Majority of the women were house wives (39.5%), while those that had a source of income were mainly traders (33.7%) and artisans (26.4%) and majority of their husbands were artisans (36.6%) (Table 1).

3.2 Respondents' Awareness of Tetanus and TT Immunization

All the women (100%) had heard about neonatal tetanus (NNT) and their source of information was from a health centre. One hundred and thirty-nine of the women (50.5%) were aware that mothers could also get infected with tetanus and 137 (49.5%) did not know if mothers could get infected (Table 2).

Table 1. Socio-demographic characteristics of women in Alakahia community

Socio-demographic variables	Frequency (276)	Percent
Age		
21-30 years	61	22.1
31-40 years	207	75.0
41-50 years	8	2.9
Mean ± SD (years)	36.36 ± 4.38	
Marital status		
Single	3	1.1
Married	273	98.9
Parity		
One	29	10.5
Two	51	18.5
Three	81	29.3
Four	65	23.6
More than four	50	18.1
Religion		
Christianity	274	99.3
Muslim	2	0.7
State of origin		
Abia	19	6.9
Akwa Ibom	54	19.6
Anambra	27	9.8
Benue	4	1.4
Delta	37	13.4
Enugu	24	8.7
Imo	32	11.6
Osun	3	1.1
Rivers	76	27.5
Mother's level of education		
Primary	69	25.0
Secondary	139	50.4
Tertiary	68	24.6
Mother's occupation		
House wife	109	39.5
Trader	93	33.7
Artisan	73	26.4
Civil servant	1	0.4
Husband's level of education		
No formal education	19	6.9
Primary	58	21.0
Secondary	159	57.6
Tertiary	40	14.5
Husband's occupation		
Business man	65	23.6
Trader	81	29.3
Artisan	101	36.6
Civil servant	8	2.9
Banker	11	4.0
Taxi driver	8	2.9
Others	2	0.7

Out of the 276 women, two hundred and one (73%) of them were aware that poor TT immunization will result in NNT. In addition, all the women were aware that delivery in unhygienic places (100%) and poor cord care (100%) could also lead to NNT (Fig. 1).

“poor”, while those that scored 6-10 were rated “good” (Table 3).

Out of the 201 (73%) women who were aware of TT immunization, 158 (78.6%) had poor knowledge about TT immunization while 43 (21.4%) had good knowledge.

3.3 Respondents’ Knowledge of TT Immunization

The knowledge of TT immunization was rated using a scale: women that scored 1-5 were rated

Poor level of knowledge about TT immunization was majorly in the area of TT immunization schedule (Table 4).

Table 2. Respondents’ awareness of neonatal tetanus and tetanus toxoid immunization

Awareness of NNT and TT immunization	Frequency (n = 276)	Percent
Heard about neonatal tetanus infection		
Yes	276	100
No	0	0
Source of information about NNT infection		
Health worker	276	100.0
Mother can get infected with tetanus		
Yes	139	50.5
No	0	0.0
I don't know	137	49.5
NNT can be prevented by immunization		
Yes	201	72.8
No	0	0.0
I don't know	75	27.2

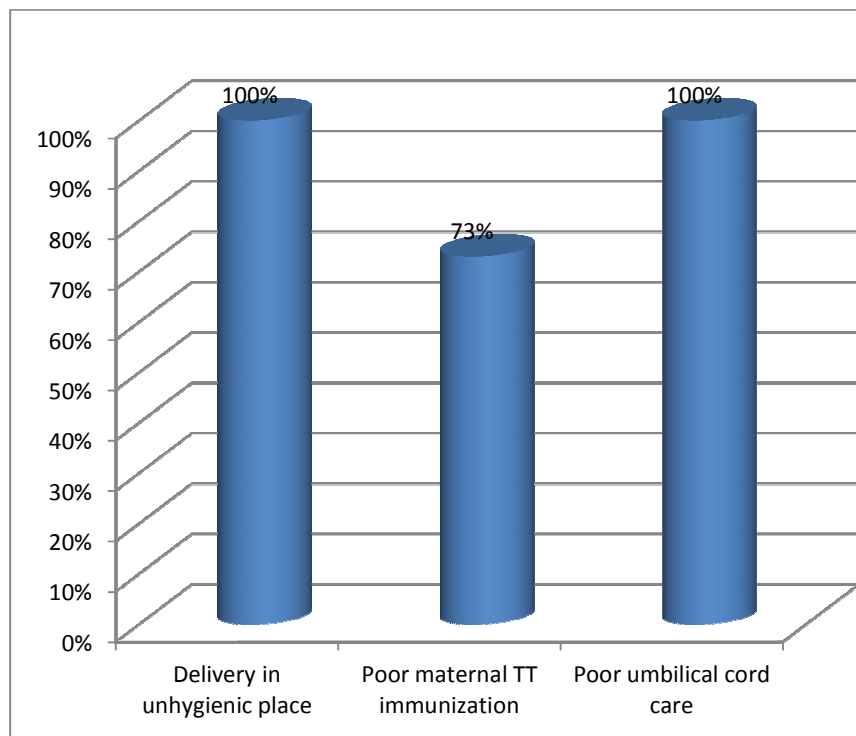


Fig. 1. Respondents’ awareness of possible causes of NNT infection

Majority of the women (27.9%) agreed that a woman requires three doses of TT vaccination to protect her baby from NNT, 27 women (9.8%) agreed that a dose is required which is higher than the 19 women (6.9%) who agreed that two doses of TT vaccination protects against NNT. Eighty-eight women (31.9%) agreed that three doses of TT immunization provide long-lasting protection for a woman while 7 women (2.5%) agreed that two doses proffer long-lasting protection; 18.5% of the women don't know the number of doses needed for long-lasting protection for a woman.

Table 3. Level of knowledge of TT immunization

Level of knowledge (number of answers assessed = 10)	Frequency (n =201)	Percent (%)
Good	43	21.4
Poor	158	78.6

According to the Integrated Management of Pregnancy and Childbirth standard, all women giving birth and their newborn babies should be protected against tetanus [15]. This is aimed at preventing maternal and neonatal tetanus. This basically can be achieved when the women in a community are aware of and have fundamental knowledge of tetanus and its prevention, then they can co-operate with available implementation strategies and participate towards achieving this goal.

This study showed that all the women were aware of NNT, and 73% of the women were aware that TT immunization is required to

prevent NNT. Seger and Abbasil [19] also reported 73% awareness of TT immunization among women in Pakistan. Nigeria and Pakistan are among the countries yet to achieve elimination of MNT [1]. This high level of awareness can serve as a strong foundation to take a step further in educating these women on the proper TT schedule and motivating them to participate in MNT elimination. Similarly, in the northern and south-western part of Nigeria respectively, Sule et al. [12] and Bamidele & Umoh [20] reported high levels of awareness among their participants. A higher level of awareness of 79.9% was reported by Alex Hart and Okoh [13]. This could be attributed to the fact that their study was carried out in a tertiary institution as compared to this study in a semi urban community.

Despite the high level of awareness of TT immunization, there was inadequate and poor knowledge about TT immunization, more so TT immunization schedule. With regards to TT immunization schedule: this study reported 27.9% of women who agreed that at least 3 doses of TT immunization are required to protect their baby from NNT infection, 6.9% and 9.8% admitted that 2 doses and a dose are required to prevent NNT respectively; also 31.9% and 2.5% agreed that three and two doses of TT immunization are required for long life immunity for women. This poor knowledge on proper TT immunization schedule was also seen in studies in Pakistan [19,21,22]. The low level knowledge on proper TT immunization schedule may have contributed to the persistence of maternal and neonatal tetanus in this part of the world, and Nigeria in particular.

Table 4. Level of knowledge of TT immunization schedule

TT immunization doses	Frequency (n =276)	Per cent
Number of doses of TT a woman requires to protect her baby from NNT		
One dose	27	9.8
Two doses	19	6.9
Three doses	77	27.9
Four doses	11	4
Five doses	0	0.0
I don't know	12	4.3
Number of doses that provides long-lasting protection for a woman		
One dose	0	0.0
Two doses	7	2.5
Three doses	88	31.9
Four doses	0	0.0
Five doses	0	0.0
I don't know	51	18.5

None of the women in this study knew that up to 4 doses could be given and that 5 doses are required to give long life immunity. The study by Alex Hart and Okoh [13] reported that 18.2% of the participants knew that 5 doses of TT immunization proffers long lasting immunity. This can probably be attributed to differences in the level of education, as participants in their study were all undergraduates. Abdelrhman [23] reported a strong association between level of education and knowledge about TT immunization schedule. Seger and Abbasi [19] in their study also observed a relationship between level of education and knowledge of TT immunization, however some of their participants (19.2%) knew that 5 doses of TT immunization should be the complete dose for women when compared to this study; focus group discussion may have influenced these women's response to questions concerning TT immunization.

Women of child bearing age can get information about tetanus and TT immunization from the media, schools, health facilities, religious groups, etc. [23]. All the women in this study heard of tetanus and TT immunization from a health worker. This highlights the importance of health workers in the community and the need to train and equip them to further disseminate information.

Elimination of neonatal and maternal tetanus is said to be achieved when there is less than one NT case per 1000 live births in every district [1]. Once neonatal tetanus has been eliminated, it is assumed that maternal tetanus infection has also been eliminated as well. This can be achieved with high level of TT immunization coverage. High level of TT immunization could be achieved with high level of awareness and adequate knowledge of TT immunization. Roosihemiatie et al. [22] reported the impart of adequate TT immunization knowledge on TT immunization coverage, that women who had knowledge of TT immunization were 2.15 times more likely to have been immunized. This calls for the need to improve the knowledge on proper TT immunization schedule among Alakahia women. This can be achieved via the mass media, use of religious groups and community heads. Also starting early to create the awareness in primary and secondary schools for the girl child will go a long way.

4. CONCLUSION

There is a high level of awareness of NNT and TT immunization among women in Alakahia

however they lack knowledge of TT immunization and its proper schedule. Thus there is need for stake holders to strategize on measures and ways to make information about TT immunization available and relevant to these women.

CONSENT AND ETHICAL APPROVAL

Ethical clearance was obtained from the Research and Ethics Committee of University of Port Harcourt before commencement of the study. Permission was obtained from the village chiefs, village heads and husbands of these women. Informed consent was gotten from the women and the reason for the study was explained to them in the local language that they understood.

All information collected was securely kept in the official database, and data access was restricted to authorized persons.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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(Accessed March 29 2017)

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Peer-review history:
The peer review history for this paper can be accessed here:
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