

Inappropriate Maternal Tetanus Toxoid Immunization : a potential predisposing Factor for Neonatal Tetanus Infection

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Summary

Ekunwe EOA. **Inappropriate Maternal Tetanus Toxoid Immunization : a potential predisposing Factor for Neonatal Tetanus Infection.** *Nigerian Journal of Paediatrics* 1996; 23: 16. The possible reasons for the observed occurrence of neonatal tetanus despite maternal antenatal care and tetanus toxoid (TT) immunization during pregnancy were examined by evaluating the immunization implementation strategies and health workers' knowledge of the issues involved. Results indicated that 27.8 percent of 162 mothers with valid TT immunization, were inappropriately immunized and therefore, probably did not possess adequate levels of antibodies which could be transferred through the placenta. The implication of this is that babies of such mothers would not be protected against neonatal tetanus. It is recommended that health services should be made as convenient as possible for clients, with adequate and regular supply of vaccines.

Introduction

ERADICATION of neonatal tetanus (NNT), one of the child health goals of the world summit for children, is crucial because 770,000 infant deaths result annually from NNT and most of these deaths occur in developing countries.^{1,2} The declared health goal is also feasible with available technology, including safe and hygienic delivery techniques and effective immunization of pregnant or potentially pregnant women with tetanus toxoid (TT).³ De-

spite the above available measures, cases of NNT continue to occur in some babies born to mothers with a history of antenatal care and tetanus toxoid immunization during pregnancy.⁴⁻⁶ This situation has led the WHO and other international health agencies to express serious concern about the efficacy of the Nigerian TT immunization programme and its consequences for the eventual elimination of NNT.⁷

Strategies for eradicating NNT include increased TT immunization coverage by the use of TT of the proper quality to be administered to women at appropriate times and intervals, in order to produce protective levels of antibodies. In view of the fact that TT is extremely

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thermostable⁸ and Nigeria receives TT supply from UNICEF, the present study was undertaken in order to examine the implementation strategies of the programme of TT immunization of pregnant women rather than the quality of the TT employed, as the possible cause of the problem of NNT in babies of women who have had antenatal care and received tetanus immunization during pregnancy.

Materials and Methods

The study was in two parts, namely; exit survey of pregnant women receiving antenatal care and secondly, focussed group discussion with health care providers. For the exit survey part, a protocol was designed to discover a woman's last menstrual period and thus, her expected date of delivery (EDD) and the doses of tetanus toxoid (TT) received and the dates they were received as validated by her immunization record card. The study was carried out in the Mushin Local Government Area (LGA) and Lagos Island LGA of Lagos State. These two areas were selected because the two major public sector health facilities for pregnant women, the Lagos University Teaching Hospital (LUTH) and the Lagos Island Maternity Hospital (LIMH) are located there. Three primary, one secondary, one tertiary and one private health facilities were selected in both LGAs as being representative of health care facilities providing maternal care services, including antenatal care. The exit survey was conducted by experienced interviewers, using the protocol, as pregnant women exited from health care facilities after receiving antenatal care.

Interview protocols were analysed for validity of immunization and appropriateness of

immunization. A woman was deemed to be validly immunised if, at the time of the interview, she possessed an immunization record card to confirm her immunization history. If a woman was not immunized, but still had enough time during which to receive an adequate course of protective TT before delivery, she was excluded from subsequent analysis. A woman was appropriately immunized if she had validly received at least, two doses of TT, with a minimum of 28 days interval and her last dose of TT at least, 30 days prior to her EDD. All others were considered to be inappropriately immunized.

Questions included in the protocols for the focussed group discussion (FGD) were designed to test the discussants' knowledge of the following: symptoms and signs of NNT, benefits of TT immunization of pregnant women, route of administration of TT, source(s) and storage conditions of TT supplies and the schedule of TT immunization during pregnancy. Major public health facilities in the two selected LGAs were identified and their nurses/midwives who were assigned to immunization services, selected as participants in the FGD sessions. Private hospitals with high volumes of TT immunization were similarly selected. Venues of FGDs were selected to be within walking distance of the various health care facilities so as not to introduce a bias into the health care providers who would actually participate as for example, the wealthier ones who can easily afford to get to a distant venue.

Each discussion group consisted of eight to 10 of the selected health-care workers. To be included they had to be active in immunization services in their various health-care facili-

ties in order to ensure homogeneity within the group. Experienced FGD moderators were recruited and trained in a classroom setting with the protocol designed for the study, during which time questions were modified where necessary. FGD sessions were carried out under the researcher's supervision and recorded on audiotapes as well as on paper. The results were analysed for general tendencies.

Results

Two hundred and seventy women were interviewed in six health facilities and of these, 108 (40.0 percent) were excluded from subsequent analysis for not being validly immunized. Of the 162 women (60.0 percent) with valid TT immunization, 45 (27.8 percent) were inappropriately immunized based on the reasons in Table.

TABLE

Reasons for Inappropriate Tetanus Toxoid Immunization of 45 Pregnant Women

<i>Reason</i>	<i>No of Women</i>	<i>Percent of Total</i>
2nd dose <30 days before EDD	9	20.0
2nd dose <28 days after first dose	4	8.9
Only one dose at >8 months of pregnancy	27	60.0
No dose at >7 months of pregnancy	5	11.1
Total	45	100.0

EDD = Expected date of delivery

Focussed group discussion revealed that all the participants had adequate knowledge of the causative agent, mode of transmission and physical manifestations of the disease. There was also universal knowledge of the two-fold benefit of antenatal administration of TT in protecting both the woman and her newborn baby. Similarly, all the participants knew the storage condition of TT as +4°C to +8°C and the importance of retaining TT's potency. One of the participants could not correctly state the route of administration.

Sixty percent of the participants accurately described the five-dose schedule, while the others accurately described the old schedule of two doses of TT during each pregnancy. All the participants correctly described appropriate time and interval of TT immunization for the production of protective levels of antibodies in the woman.

Public sector participants received TT supplies from EPI stores, while their private sector colleagues received theirs from nearby pharmacy outlets who in turn, received them from sources unknown to the participants. Public sector participants reported experiencing delays and reductions in their vaccine supplies, problems that were not being experienced in the private sector.

Discussion

The results of the present study have shown that 27.8 percent of the women who regularly attended antenatal clinic were inappropriately immunized against tetanus by either of the schedules. The implication of this finding is that babies of such women were born unprotected against NNT and this may partly explain

the observed phenomenon of cases of NNT in babies of women who claimed to have been immunized with TT during pregnancy. The findings of the FGDs indicate that the reason for such a high percentage of inappropriate immunization is not to be found in the knowledge, or lack of it, of health workers.

The more important benefit of the TT immunization of pregnant women is that their babies should be born protected against NNT. This requires that each woman receives a course of TT which allows her to produce protective levels of tetanus antibodies, which she can transfer to her baby transplacentally. In order to achieve this, a woman must be appropriately immunized, that is, she should receive at least two doses of TT during the course of each pregnancy, with at least a 28-day interval between both doses and the second dose should be administered at least 30 days before the date of delivery. In the alternative, a woman should receive five doses of TT at appropriate intervals whether or not she is pregnant. In both cases, her babies would be protected against NNT.

Strategies for increasing the percentage of pregnant women who are appropriately immunized with TT, should be implemented in order to eradicate NNT. To this end, health services, with particular reference to antenatal care, should be made as convenient as possible for clients because, if the antenatal visit is inconvenient in any way, mothers will delay as long as possible, before they register for antenatal care, thus effectively reducing the period during which they can receive adequate courses of TT immunization. This was the finding in the present study as most women started attending the antenatal facility at or after seven

months of gestation. Factors identified by health facility clients as constituting 'inconveniences' in the delivery of health care included long waiting time, hostile staff attitude and high cost.⁹

Vaccine supplies should be improved both in quantity and regularity because irregular and inadequate supplies of vaccines, as reported by health workers in the public sector facilities in the present study, may result in mothers making fruitless journeys to the clinics. This would have the effect of becoming a disincentive, such that they either stop attending altogether, or delay their TT immunization until it is no longer effective.

The use of one or two specific days of the week for antenatal care might also contribute to this problem. A woman whose "clinic day" falls on a public holiday has to wait for another week before she can attend the clinic and receive her last dose of TT, by which time the dose may prove inappropriate. The full integration of health services, such that all components of health care are available every day, should help in this regard. However, it has been observed that even when services are fully integrated, women resist the change from their traditional practice of attending health facilities only on "clinic days".⁹ Therefore, integration of health services should be combined with constant encouragement of women to use the health facility at all times for all services, if it is to increase the proportion of women who are appropriately immunized.

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