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Original Research Article

Tetanus Toxoid Vaccination Status of Women in Baghdad

Najlaa Fawzi Jamil[1*], Alaa A.Salih[2], Mayasah A.Sadiq[3], Marwa Ibrahim-MOH[4]

[1]Prof. Mustansiriyah-University-Faculty of Medicine
[2]Assistant Prof Mustansiriyah-University-Faculty of Medicine
[3]Assistant Prof Mayasah A.Sadiq- Mustansiriyah-University-Faculty of Medicine
[4]Family Physician

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***Corresponding Author:** Najlaa Fawzi Jamil
Prof. Mustansiriyah-University-Faculty of Medicine

Abstract

Background: Immunization remains one of the paramount public health interventions and a cost effective method to reduce both the ailment and death associated with infectious diseases. Uptake of vaccination is dependent not only on providing of the vaccination services but also on other influences including awareness and practice of women. ***Objectives:*** To assess tetanus toxoid immunization status of mother's. In addition, to address the factors influencing their immunization status. ***Method:*** Cross sectional study conducted in ten primary health care centers in Baghdad for the period from February until the end of October 2020. Convenient sample of mothers, who had delivered a live baby within the previous 12 months from the study and attended the selected primary health care centers in Baghdad were recruited. An interview questionnaire used to collect data regarding history of tetanus toxoid vaccine up take of the mothers during their last pregnancy. ***Results:*** The total number of mothers enrolled in the study was 400, 214(53.5%) of them were received tetanus toxoid vaccine (TTV) during their last pregnancy. 127(59.3%) of the mothers were uptake two doses of TTV. Among the study group, 31.75% of mothers were considered as immunized according to WHO classification. Age of mother, education, and respondents' working status; alongside with antenatal care attendance and place of delivery all had insignificant impact on the immunization status. Lack of time was the main reason for not vaccination (22.6%). ***Conclusion*:** Tetanus toxoid immunization coverage was inadequate. For that reason, immunization campaigns targeting enhanced utilization of immunization services by mothers and women of childbearing age are highly recommended.

Key words: Tetanus toxoid, immunization, women, Baghdad.

INTRODUCTION

Tetanus is one of the vaccine-preventable, bacterial diseases caused by a toxin produced by Clostridium tetani. It is a life-threatening disease, which causes severe mortality among maternal, neonatal, and young infant. Women exposed to the microorganism during pregnancy or within 6 weeks after delivery are likely to develop maternal tetanus (MT).

Infants born to non-immunized mothers are susceptible to neonatal tetanus (NT). Infection frequently happens through the unhealed umbilical cord. The majority of cases of neonatal tetanus develop symptoms during the first 3–14 days after birth [1, 2].

The most important predisposition to this disease is lack of mother vaccination with Tetanus Toxoid vaccine (TTV), together with deliveries performed by untrained birth attendant in an unclean environment and with unhygienic birth practices [3].

Maternal and neonatal tetanus (MNT) is a triple failure of the health system (immunization Programme, antenatal care, and clean and safe birth practices) which commonly affect deprived and underserved population groups, who did not have access to suitable health services [4].

The World Health Organization recommends that women at childbearing age should receive a 5-dose regimen of tetanus toxoid vaccination to protect the birth against tetanus. This consist of a first dose given at any time from the age of 15 years, a second dose4 weeks later, and a third dose 6–12 months after the first two doses. The fourth and fifth doses given with 1 year apart [5].

In many countries including Iraq, TT vaccination is part of routine maternal health care services, where at least two doses of the TT vaccination be given to pregnant women during antenatal care (ANC) visits [6].

In Iraq according to Ministry of Health (MOH) annual report 2019, 48% of pregnant women vaccinated with TT2+, and only (10%) of women in reproductive age were received tetanus toxoid vaccines second dose and more [7].

Women acceptance of recommended TT vaccinations is a key element for enhancing maternal immunization rates. Socio-cultural and psychological factors were identified to be of important impacts upon maternal vaccine acceptance. Previous studies had recognized some predictable factors for TT immunization utilization such as age of the mothers, educational status, marital and occupational status, In addition to joint health decision with husband, distance from health facilities, wealth index, fear of side effects, and dread of infertility [8, 9].

ANC follow-up, use of modern family planning, parity, and information about TT vaccination, alongside with knowledge, attitude and awareness of mothers towards TT vaccination also determined the TT immunization status [10, 11].

Objectives of study

To assess the tetanus toxoid immunization status of mothers in Baghdad and to explore the factors influencing mothers' immunization status

SUBJECTS AND METHOD

Across sectional study conducted in ten primary health care centers (PHCCs) in Baghdad/Capital of Iraq. The duration of the study extended from February until the end of October 2020, with around three months of interruption due to Covid-19 pandemic curfew. A convenient sampling method had used to select the PHCCs.

The study group comprised convenient sample of mothers in the reproductive age group, who had delivered a live baby within the previous 12 months from the study and attended the selected PHCCs for any reason related to their health or for vaccination for their children and agree to participate in the study.

A face-to-face interview was use as a data collection technique, via a structured questionnaire, which was prepared for the purpose of the study after revising, related published studies.[12]

The questionnaire encloses questions to describe some socio-demographic characteristics of the mother: Age, number of children, the education and working status. In addition to questions, about the number of TT vaccine doses obtained in last pregnancy and the different reasons of not been vaccinated. The questionnaire also inquiries about the antenatal care attendance and place of delivery in the course of the last pregnancy.

OPERATIONAL DEFINITION

Vaccinated by history

Memory recall used to determine the immunization of mothers enrolled in the study. Mothers' self-report of TT vaccination doses received without any documented evidences.

Immunization Status

According to the WHO, women who received two or more doses of TTV (TT2+) were considered immune, while those who did not receive the vaccine or received less than two doses were considered non-immune [2].

ANC attendance

The mother had attended any health facility for ANC and achieved four visits or more during the course of pregnancy.

The place of birth: Hospital, home.

Approval and official permission

An ethical clearance for the study obtained from the Iraqi Board for medical specialization. An official letter of permission acquired from Baghdad/ Al-Karkh and Al-Rusafa Health Directorates, primary health care districts in both health directorates, and addressed to directors of each selected primary health care centers.

STATISTICAL ANALYSIS

The available statistical package of SPSS-27 (Statistical Packages for Social Sciences- version 27) employed to analyze the data. Descriptive statistics, like frequencies percentages, mean and SD were computed.

Pearson's χ 2 -test was used for statistical associations. Statistical significance was declared if the P-value was <0.05.

RESULTS

The study enrolled four hundred mothers, 188 (47.0%) were at age group (30-39) years, and 63% of them had 1-2 children Table-1.

Among the study group, 96.5% and 90.5% of the mothers had attended antenatal care and delivered in hospital during the last pregnancy respectively as demonstrated in table-2.

The result in figure -1 showed that 214(53.5%) of the mothers were received TT during their last pregnancy.

Out of 214 mothers who received TT, 127(59.3%) uptake 2 doses of TT during last pregnancy.Figure-2.

According to WHO classification, 127(31.75%) of the mothers enrolled in this study were immunized, and 237(68.25%) of them were not immunized Figure-3.

Out of 400 participants, 186(46.6%) did not receive TT during last pregnancy and all of them gave reasons why they did not receive the vaccine. lack of time was the main reason mentioned by 42(22.6%) of these mothers , followed by fear of harm to self and/or baby which was stated by 27 (14.5%)mothers. The rest of reasons presented in table-3.

Table -4 illustrates the relation of some characteristics of mothers to immunization status.

The result found that the rate of immunization tend to decrease with increasing age, as 50% of those in age group less than 20 years were categorized as immunized in comparison with 24.2% of those in age group 40years and older . Despite that, the age of mothers failed to reveal a statistically significant association with immunization status (P=0.125).

Both mothers' education and working status displays no association with immunization status (p=.978, P=0.433) respectively.

The rate of immunization declined with increasing the number of children, as 37.30% of mothers with 1-2 children were categorized as immunized in comparison with 19.1% of those with five& more children. The number of children had highly significant impact on immunization status (p=0. 006).

Furthermore, when ANC attendance and place of delivery were considered, the results shown no statistically significant consequence on immunization status (p= 0.794, P=0.696) respectively.

Table-1: Distribution of the study group according to socio-demographic characteristics (N=400).

Sociodemographic characteristics		No	%
Age (years)	<20years	12	3.0
	20-29	138	34.5
	30-39	188	47.0
	=>40years	62	15.5
	Mean±SD (Range)	31.4±6.4 (17-46)	
Educational level	Primary	51	12.8
	Intermediate & secondary	67	16.8
	College & higher	282	70.4
Working status	Working	209	52.2
	Not working	191	47.8
Number of children	1-2	252	63
	3-4	101	25.3
	5 & more	47	11.7
	Mean±SD (Range)	2.5±1.6 (1-9)	

Table-2: The distribution of mothers according to antenatal care attendance and place of delivery

		No.	**%**
Attended ANC during the last pregnancy	Yes	386	96.5
	No	14	3.5
Place of ANC during the last pregnancy (n=386)	PHCC	107	27.8
	Private clinic	275	71.2
	Hospital	4	1.0
Place of birth of the last delivery	Hospital	362	90.5
	Home	38	9.5

Table-3: The reasons for not receiving TT in last pregnancy (N=186)

Reason stated by mothers for not receiving TT	**NO.**	**%**
Lack of time	42	22.6
Fear of harm to self and/or baby	27	14.5
Doctor did not inform to take the vaccine	20	10.8
Do not believe in TT(lack of interest)	18	9.7
Long Distance to PHCC	17	9.1
Lack of knowledge (unaware about TT)	15	8.1

Reason stated by mothers for not receiving TT	NO.	%
No reason	15	8.1
Not faced any problem related to being not vaccinated in previous pregnancy	10	5.3
Not allowed by husband/ other relatives	10	5.3
Poor attitude of health staff at center	8	4.30
Completed doses of TT vaccine	4	2.2
Total	186	100

Table-4: The distribution of study group according to some mothers' characteristics and immunization status (N=400)

Mother characteristics		Immunization status (according to WHO criteria)				P value
		Immunized		Not Immunized		
		No	%	No	%	
Age (years)	<20years	6	50	6	50	0.125
	20-29	51	36.95	87	63.04	
	30-39	55	29.3	133	70.7	
	=>40years	15	24.2	47	75.8	
Educational level	Primary	16	31.4	35	68.6	0.978
	Intermediate& secondary	22	32.8	45	67.2	
	College & higher	89	31.6	193	68.4	
Working status	Working	70	33.5	139	66.5	0.433
	Not working	57	29.8	134	70.2	
Number of children	1-2	94	37.30	158	62.7	.006731*
	3-4	24	23.8	77	76.2	
	5 & more	9	19.1	38	80.9	
Attended ANC during the last pregnancy	Yes	123	31.9	263	68.1	0.794
	No	4	28.6	10	71.4	
Place of birth at last delivery	Hospital	116	32	246	68	0.696
	Home	11	28.9	27	71.1	
*Significant difference between percentages using Pearson Chi-square test (χ^2-test) at 0.05 level.						

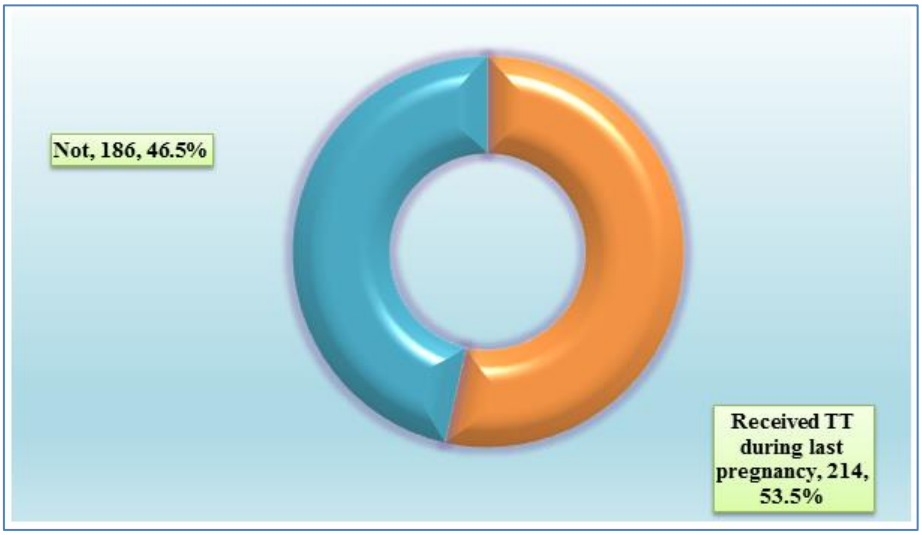

Fig-1: Utilization of tetanus toxoid immunization during last pregnancy by mothers (N=400)

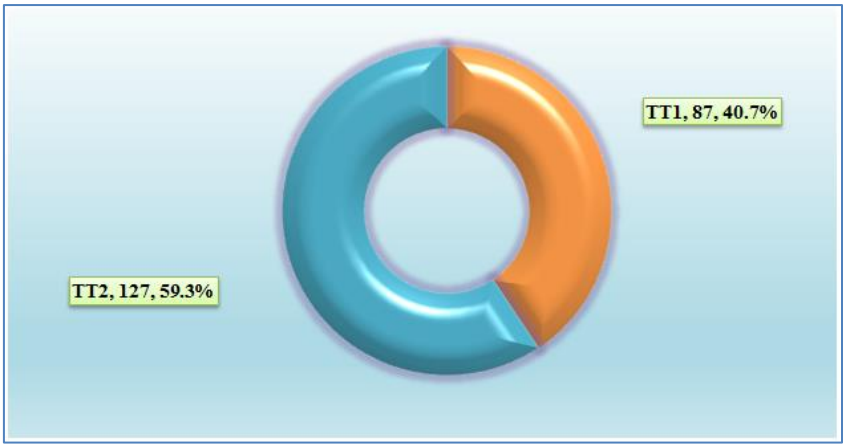

Fig-2: Tetanus toxoid doses up take by mothers during last pregnancy (N=214)

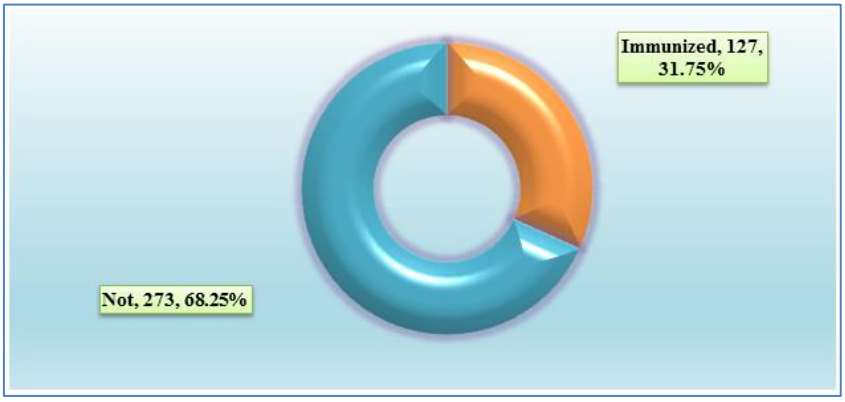

Fig-3: The immunization status of mothers according to WHO classification

DISCUSSION

It has been recognized that the approach of mothers concerning having TT vaccine to prevent their new-born from the NNT is a sign of their orientation to the vaccine in addition to their willingness to receive TT vaccine as a means of avoiding their new-born babies from contacting NNT.

Many factors may affect TT vaccination during pregnancy. The delivery and acceptance of recommended vaccinations is an ongoing challenge for health care providers and public health system [13].

According to the results obtained from the present study, TT vaccine utilization during the last pregnancy found to be relatively low (53.5%). This rate was on the same line with results reported by studies from Turkey [14], Pakistan [15], and Egypt [16] in which TT vaccination rate ranged between (< 60% to 74%).

The low level of TT vaccination uptake might be a result of refutation of TT vaccination by pregnant women due to mistaken belief and irregular immunization leading to low vaccination rate. Furthermore, up take of tetanus toxoid immunization was subjective based on information provided by the mothers enrolled in the study. Such information is reliable to the extent the mothers can recall and answer.

In this study, 59.3% of study group received two doses of TT during last pregnancy. This rate of TT vaccinations was parallel to other studies accomplished in other countries such as in: in Ethiopia (52.6%) [17], Kenya (52.0%) [18] and Pakistan (55.6%) [19]. This finding submit the need for health workers to pay more attention to educating pregnant women and women of child bearing age on TT immunization schedule(mainly its protective doses), its usefulness in protecting mother and newborn baby from tetanus, and its safety in order to expedite uptake the vaccine by them [12].

TT vaccination uptake ≥ TT2 doses is consider to have a considerable period of protection against tetanus infection. TT2+ immunization coverage among pregnant mothers accounts for 75% worldwide ranging from 95% in South East Asia to 53% in the East Mediterranean and 63% in Africa [20]. In Iraq, it was 48% according to MOH annual report 2019 [7].

While, the result of the current study showed that only (31.75%) of study participants were protected against tetanus during last pregnancy. The result was in agreement with findings from previous studies

conducted in Ethiopia (39.12%)[9],Egypt (27.7%) [21], and Yemen(33.6%)[22].

The findings from aforementioned studies might point out that most countries as well as Iraq could not reach the WHO Global Immunization target of at least 90% of national TT vaccination coverage and at least 80% of TT vaccination coverage in every district [23].

The main reason stated by mothers in the present study for the non-receiving TT vaccine was lack of time. The study result seems to be a common reason according to the results of studies carried out in Pakistan [19, 24].

This finding might be related to that mothers are habitually busy at home since they are responsible for many household tasks, such as caring for children and older people as well as other house hold activities. For that reason, they often hesitate to attend PHCCS, which might be are relatively far from their homes. Moreover, TT vaccination requires repeated visits to health facilities for complete immunization, such recurrent visits might be demanding for mothers if PHCCS are relatively far away. Ensuring accessible health facility coverage in every part of the district could minimize such problems.

Factors associated with TT Immunization Status

The study revealed that there was an insignificant association between mothers' age and immunization status. This finding also confirmed by previous studies from Sudan [25] and Turkey [26] which reported that tetanus vaccination status**,** are not associated with age of woman.

Mothers having secondary and above education were more likely to immunize with at least two dose of tetanus toxoid vaccine as compared to those mothers with primary education. Yet the results failed to reveled statistical significant association between education and immunization status. The results were consistent with findings reached by studies from Nigeria [10], Egypt [27], and Pakistan [28].

The result did not show any relationship between working status of the mother and immunization status, the study result in agreement with finding from studies conducted in Sudan [25] and Afghanistan [29] where woman's occupation found to play no role on utilization of TT vaccination.

The number of children has shown significant association with immunization status. It adversely affects the probability of TT vaccination. Previous studies support such type of influence [30, 31]. The probable justification may be that during their prior pregnancies, women are more wary and they attempt to seek ANC. By the passage of time owing to experience and self-confidence from earlier pregnancies, they feel less necessity of maternal health-care in the form of TT vaccination for following pregnancies. Moreover, at higher birth-order of child the women feel themselves protected due to TT vaccination during previous pregnancies [32].

Previous studies revealed that having ANC follow-up during pregnancy would help mothers' uptake of TT2 and above doses [28, 33]. While the present study finding found that ANC attendance had no significant influence upon TT vaccination up take. This could be attributed to that, the results disclosed that 95.5% of mothers enrolled in the current study claim that they received ANC during last pregnancy and 71.2% attended privet clinic for this care. It could be determined that there were a substantial number of missed opportunities for TT immunization within the same group of mothers as only 53.5% were received TT immunization that was too far from the ANC service was attained. Health care providers in different health facilities have to fill this gap by taking a better advantage of mother's ANC attendance opportunities during the ANC visits [34].

According to the results, no significant difference established between places of delivery and immunization status. These finding was in parallel with the results from previous study conducted in Egypt [21], which confirmed that the women who were expected to deliver at home were advised to take the vaccine, while those who were expected to deliver in reasonably well equipped hospitals are advised otherwise. It seem like that obstetricians themselves hold a wrong concept that as long as delivery occurs in equipped and clean hospital, then, there is no need for TT vaccine. This outcome might explain the current study result.

In fact, this argument would only be useable in circumstances where all deliveries are performed under optimum conditions and when effective tetanus immunization programs and good post-exposure prophylaxis after pregnancy offered, which is almost not the case in most developing countries [35].

CONCLUSION AND RECOMMENDATIONS

The utilization of TT vaccination was inadequate; as a result, substantial number of mothers was not immunize and not protected against Tetanus during their delivery. There is a need to launch of health awareness s and tetanus toxoid vaccination campaigns by MOH targeting females in reproductive age, at the secondary schools of girls, and universities to rise the coverage of TTV to reach the national target rate. Rising the awareness of public about the importance of TTV to every person, via different forms of mass media, posters and information pamphlets, as well as religious and community leaders.

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