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Tetanus immunization in pregnant women: the factors affecting maternal evaluation, tetanus vaccination and vaccination rate

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Abstract

Objective: In our study, we aimed to evaluate the knowledge, attitudes and behaviors of pregnant women about tetanus vaccine who admitted to our hospital.

Methods: The pregnant women who admitted to our clinic between January 2019 and July 2019 were included in this cross-sectional study. All participants took a questionnaire evaluating tetanus vaccine rates during pregnancy and the knowledge, attitude and behaviors of pregnant women about tetanus vaccine.

Results: A total of 227 pregnant women were included in the study. The mean age of the patients was 29.5±6.12, and the mean week of gestation was 30.79±7.49. It was found that 24 (52.1%) of the 46 (12.6%) patients who were not vaccinated for tetanus in their previous pregnancies believed that the vaccine was harmful for the baby and therefore they were not vaccinated. In addition, it was found that the physicians who carried out the follow-ups of 2 of these 46 patients, who stated that they were not vaccinated in their previous pregnancies, were also anti-vaxxers. It was found out that 172 (75.7%) patients learnt from the family practitioner's nurse that they needed to be vaccinated. The number of the patients who learnt from the obstetrician-gynecologist that they needed to get tetanus vaccine was only 2 (0.8%). While there were 177 (77.9%) patients who were / will be vaccinated for tetanus in this pregnancy, 47 (20.7%) patients were indecisive for being vaccinated or not. Also, 200 (88.1%) patients knew that tetanus vaccine does not have any side effect on pregnancy.

Conclusion: The greatest obstacles to the vaccination are the belief that vaccine may harm the baby, and the lack of knowledge about vaccination. The greatest obstacle caused by the healthcare professionals is the lack of providing sufficient information about vaccine, not explaining the necessities of vaccine to patients and the perception of obstetricians in particular that only the primary healthcare organizations are responsible for tetanus vaccine.

Keywords: Pregnancy, vaccine, vaccination, tetanus, immunization.

Özet: Gebelerde tetanoz immünizasyonu: Maternal değerlendirme, tetanoz aşılama durumu ve aşılama oranını etkileyen faktörler

Amaç: Bu çalışmada hastanemize başvuran gebelerin tetanoz aşısı hakkındaki bilgi, tutum ve davranışlarının değerlendirilmesi amaçlanmıştır.

Yöntem: Bu kesitsel çalışmada, Ocak 2019 ve Temmuz 2019 ayları arasında kliniğimize başvuran gebeler dahil edildi. Tüm katılımcılara gebelikte tetanoz aşısı oranlarını, gebelerin tetanoz aşısı hakkındaki bilgi, tutum ve davranışlarını değerlendiren bir anket uygulandı.

Bulgular: Çalışmaya toplam 227 gebe dahil edildi. Hastaların ortalama yaşları 29.5±6.12 bulunurken ortalama gebelik haftası 30.79±7.49 saptandı. Daha önceki gebeliğinde tetanoz aşısı yaptırmayan 46 (%12.6) hastanın 24'ünün (%52.1) ise aşının bebeğine zararlı olduğunu düşündüğü için aşı yaptırmadığı tespit edildi. Ayrıca daha önceki gebeliğinde aşı yaptırmadığını belirten 46 hastanın 2'sinin ise takip eden doktorunun aşıya karşı olduğu saptandı. 172 (%75.7) hastanın tetanoz aşısı yaptırması gerektiğini aile hekimi hemşiresinden öğrendiği tespit edildi. Tetanoz aşısı olması gerektiğini kadın hastalıkları ve doğum uzmanından öğrenen hasta sayısı ise sadece 2 (%0.8) idi. Bu gebeliğinde tetanoz aşısı olan/olacak hasta sayısı 177 (%77.9) olarak bulunurken 47 (%20.7) hasta ise aşıyı yaptırıp yaptırmama konusunda kararsızdı. Ayrıca 200 (%88.1) hastanın tetanoz aşısının gebelikte yan etkisi olmadığını bildiği tespit edildi.

Sonuç: Aşılanmanın önündeki en büyük hasta kaynaklı engel, hastaların aşının bebeklerine zararlı olabileceğini düşünmeleri, aşı hakkındaki bilgi eksiklikleridir. Sağlık çalışanları kaynaklı en büyük engel ise hastalara aşı hakkında yeterli bilgi verilmemesi ve aşının gerekliliğinin yeteri kadar anlatılmaması ve özellikle kadın doğum hekimleri tarafından tetanoz aşısının sadece birinci basamak sağlık kuruluşlarının sorumluğunda gibi algılanmasıdır.

Anahtar sözcükler: Gebelik, aşı, aşılama, tetanoz, bağışıklama.

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Introduction

Vaccinations during pregnancy are a significant part of adult immunization practices. Due to the physiological changes during pregnancy, maternal infections and associated complications are more severe and serious compared to the normal population.[1] Thanks to the maternal immunization, preterm labor, low birth weight and intrauterine growth retardation risks are decreased.[2] Fetus is protected maternally against congenital malformations, neurological diseases and infections and the first 6 months of newborn can be healthier by the antibodies transferred from mother.[2] The studies show that this effect is a result of the protection of mother against inflammatory diseases rather than the direct protective effect of vaccine.[3]

Maternal and neonatal tetanus (MNT) is a disease which can be prevented by maternal vaccination during pregnancy.[4,5] However, due to not vaccinating pregnant women in developing countries and carrying out the deliveries in non-sterile environments, it has been still a major health problem today.[6] The vaccinations during pregnancy have attracted great and increasing attention in the recent years, and the observational studies showed that the vaccination during pregnancy is a safe and efficient health strategy not only for mothers but also for the fetuses.[7] Therefore, it is quite important to make all women at reproductive ages, pregnant women particularly, immune against tetanus and carrying out the deliveries under healthy conditions. For that purpose, MNT vaccinations were carried out in 104 countries in 2006 for MNT elimination.[7] In Turkey, within the scope of Extended Immunization Program (EIP), it has been aimed to provide immunization with three doses of tetanus vaccine for free, two doses of which during pregnancy and one dose of which after labor, for women between 15 and 49 years of age and pregnant women as part of the primary healthcare and to round up tetanus vaccine to five doses later for protection during fertility period.[8,9] Also, no correlation has been found between applying Tdap during pregnancy and spontaneous onset of preterm labor, IUGR, fetal death and hypersensitivity diseases.[10, 11] Yet, the attitude towards vaccines is not at a desired level neither in the world nor in Turkey. Many pregnant women are not vaccinated for influenza or tetanus in the USA. According to the data of the Centers for Disease Control (CDC), the vaccination rates of pregnant women who give live birth are 27% in 2014 and 42.1% in 2015.[11] It is known that the reasons of pregnant women for not being vaccinated include the safety concerns, lack of awareness and limited risk perception for themselves and their children.[12] The studies show that women having more knowledge about the benefits of vaccination are keener to get vaccinated during pregnancy.[13]

In our study, we aimed to evaluate the knowledge, attitudes and behaviors of pregnant women about tetanus vaccine who admitted to our hospital.

Methods

The adult pregnant women at the first, second and third trimesters who admitted to pregnancy class of a secondary care hospital between January 2019 and July 2019 were included in this cross-sectional study. The informed consents were received from all participants. The pregnant women who did not want to participate and those younger than 18 years old were excluded from the study. The study was prepared prospectively and a questionnaire was created by the researches for the patients by reviewing relevant literature after obtaining the approval of ethics committee (ethics committee no: 2019/01). The participants were informed about the study before the interviews and all participants were informed about the interview confidentiality.

The socio-demographic characteristics of the pregnant women (age, educational status, profession, pregnancy history, current week of gestation, monthly net income) were asked in the first part of the questionnaire, and the following questions were asked in the second part: their follow-up center (private or state hospital), follow-up center for the previous pregnancy (without follow-up, private clinic, private hospital, state hospital, family practitioner), tetanus vaccination in previous pregnancy (the responses were yes / no, and the reasons were asked if it was replied "no"), which previous pregnancy did they get tetanus vaccine, and where did they get their tetanus vaccine (state hospital / family practitioner/private hospital), who recommended tetanus vaccine (my own idea/family practitioner/family practitioner's nurse/obstetrician-gynecologist), did they get tetanus vaccine except pregnancy (why if the answer is "yes"), will they get tetanus vaccine in the current pregnancy (yes/no/I do not know), do they think tetanus vaccine during pregnancy have any side effect (yes/no/I do not know). All answers were recorded.

Table 1. The socio-demographic data of the pregnant women.

Socio-demographic data	n (%)	Mean ± SD	Median (IQR)	Min-Max
Gravida		1.79±1.7	2	0–8
Parity		0.89±0.91	1 (1)	0–4
Week of gestation		30.79±7.49	32	5–41
Age				
19–29	159 (70%)			
30–39	65 (28.6%)	29.5±6.12		
40–49	3 (1.4%)			
Educational status				
N/A	11 (4.8%)			
Primary - secondary school	139 (61.2%)			
High school	55 (24.2%)			
University	22 (9.7%)			
Profession				
Housewife	212 (93.8%)			
Worker	11 (4.8%)			
Artisan	2 (0.7%)			
Other	2 (0.7%)			
Income (TRL)				
Low (<1600)	144 (64%)			
Medium (1600–2500)	52 (22.9%)			
High (>2500)	31 (13.6%)			

The data were analyzed by SPSS 24.0 (Statistical Package for the Social Sciences; SPSS Inc., Chicago, IL, USA). The statistical analyses were represented as mean ± standard deviation (mean±SS) and percentage values.

Results

All pregnant women at the first, second and third trimesters who admitted to the clinic between January 2019 and July 2019 were included in the study. Of 312 participants, 79 were excluded from the study as they could not speak and understand Turkish and 6 for not accepting to participate in the study. A total of 227 pregnant women were included in the study.

The socio-demographic data of the participants are shown in the **Table 1**. The mean age of the patients was 29.5±6.12, and the mean week of gestation was 30.79±7.49. While 212 (93.8%) of the participants were housewives, 139 (61.2%) of them were primary and secondary school graduates. One hundred and forty-four (64%) patients had low income. Previous pregnancy information and the answers for the status of getting tetanus vaccine are listed in **Table 2**. One hundred and sixty-eight (74%) patients had their follow-ups for the previous pregnancy at a state hospital. Also, 160 (78%) patients stated that they got tetanus vaccine in their previous pregnancy, and it was found that 24 (52.1%) of 46 (12.6%) patients, who did not get tetanus vaccine in their previous pregnancy, were not vaccinated because they believed that the vaccine was harmful for the baby. In addition, it was found that 2 of these 46 patients, who stated that they were not vaccinated in their previous

Table 2. Information about previous pregnancy and the status of getting tetanus vaccine.

The center where pregnancy follow-up was done (previous pregnancy)	
No follow-up (first pregnancy)	24 (10.61%)
Private clinic	1 (0.4%)
Private hospital	31 (13.7%)
State hospital	168 (74%)
Family practitioner	3 (1.5%)
Did you get tetanus vaccine in your previous pregnancy?	
No (first pregnancy)	21 (9.4%)
Yes	160 (78%)
No (why?)*	46 (12.6%)
It may be harmful for my baby	24 (52.1%)
I am not in the tetanus risk group	12 (26%)
The vaccine has no benefit	19 (41.3%)
My doctor is against vaccination	2 (4.3%)
Which previous pregnancy did you get tetanus vaccine?	
No (first pregnancy)	83 (36.5%)
<4	143 (62.9%)
All pregnancies	1 (0.4%)

*Multiple options were selected.

pregnancies, did not get vaccine as their physicians who carried out the follow-ups were anti-vaxxers.

The information about current pregnancy of the patients and their knowledge, attitudes and behaviors about tetanus vaccine are given in the **Table 3**. Two hundred and twenty-one (97.4%) patients had their follow-up for their current pregnancy in a state hospital, 172 (75.7%) patients learnt from family practitioner's nurse that they needed to get tetanus vaccine. The number of the patients who learnt from the obstetrician-gynecologist that they needed to get tetanus vaccine was only 2 (0.8%). While there were 177 (77.9%) patients who were / will be vaccinated for tetanus in this pregnancy, 47 (20.7%) patients stated that they were indecisive for being vaccinated or not. Also, 200 (88.1%) patients knew that tetanus vaccine does not have any side effect on pregnancy.

Table 3. The information about current pregnancy of the patients and their knowledge, attitudes and behaviors about tetanus vaccine.

The center where pregnancy follow-up was done (current pregnancy)	
Private hospital	6 (2.6%)
State hospital	221 (97.4%)
Where will / did you get tetanus vaccine in your current pregnancy?	
State hospital	2 (0.8%)
Family practitioner	190 (83.7%)
Private hospital	35 (15.4%)
Who recommended tetanus vaccination?	
My own idea	1 (0.4%)
Family practitioner	20 (8.8%)
Family practitioner's nurse	172 (75.7%)
Obstetrician-gynecologist	2 (0.8%)
No one recommended	32 (14%)
Did you get tetanus vaccine except pregnancy?	
Yes (why?)	21 (9.2%)
Trauma	18 (85.7%)
My doctor recommended	3 (14.2%)
No	166 (73.1%)
I do not remember	40 (17.6%)
Did / will you get tetanus vaccine in your current pregnancy?	
Yes	177 (77.9%)
No	3 (1.3%)
It may be harmful for my baby	2 (66.6%)
I am not in the tetanus risk group	1 (33.3%)
The vaccine has no benefit	0
My doctor is against vaccination	0
I do not know	47 (20.7%)
Do you think tetanus vaccine during pregnancy have any side effect?	
Yes	10 (4.4%)
No	200 (88.1%)
I do not know	17 (7.4%)

Discussion

The majority of the participants in this study were housewives and primary - secondary school graduates. Most of the patients learnt that they need to be vaccinated not from obstetricians but from family practitioner's nurse. Also, while 77.9% of the participants reported that they got / will get vaccinated in this pregnancy, 88.1% of the patients knew that tetanus vaccine had no side effect on pregnancy. Twenty-four of 46 patients who refused to get vaccinated in their previous pregnancy believed that the vaccine could be harmful for the baby and therefore did not get vaccinated, and 2 of 3 patients who did not / will not get vaccinated in the current pregnancy were anti-vaxxers due to the same reason.

A study conducted in Turkey about the vaccination rates of pregnant women reported that the pregnant women mostly accepted to get tetanus vaccine with a rate of 47% compared to other recommended vaccines.[14] This rate was followed by influenza vaccine with a rate of 3% and hepatitis B vaccine with a rate of 0.5%. In the same study, the most common reason for refusing tetanus vaccine (26.8%) reported by the pregnant women was "my doctor did not recommend".

The vaccine which is most commonly recommended during pregnancy and achieves the highest success with guidance is tetanus vaccine.[15] Other studies carried out in 2001 in Turkey reported the vaccination rate of pregnant women for tetanus as 46.7%[16] and a study conducted in 2002 reported the rate as 54.8%.[17] In our study, 77.9% of the patients stated that they got or will get tetanus vaccine in their current pregnancy. This rate is quite high compared to the rates reported in the literature in Turkey. The possible reasons of the high rate of getting tetanus vaccine are the health policies increasing in time and the controlled vaccine follow-up. In 2009, the Ministry of Health started to recommend it to the pregnant women as a routine practice.[18] In 2010, World Health Organization (WHO) announced that Turkey was one of 39 countries where MNT could not be eliminated.[19] We might have a higher rate than the literature due to the up-to-date data in our study and vaccination rates increasing in time. However, this rate shows that there are still anti-

vaxxer pregnant women refusing vaccination and that the tetanus vaccination is not at a desired level. Anti-vaccination has become a threat not only in Turkey but also in the world. Due to this attitude, immunization rates have declined across the world. For example, the rate of tetanus vaccination declined to 85% in Italy in 2015 and to 88% in the entire Europe. According to 2017 data, the rate of diphtheria-tetanus-pertussis vaccination declined to 92% in Europe and to 91% in the USA.[20]

Pregnancy is the most convenient period to establish immunization. According to 2013 Turkey Demographic and Health Survey (TNSA) results, 95% of women get service at least once from a healthcare professional (doctor or nurse / midwife) during prenatal care.[21] Although there are patients in our country who cannot have sufficient doctor follow-up during pregnancy, prenatal care program created by the Ministry of Health recommends providing qualified follow-up to each pregnant woman at least four times.[22] Since midwives and nurses in particular are the healthcare professionals who meet with the pregnant women the most during their follow-ups at primary care, they have an ideal position to train and inform pregnant women about which vaccines are recommended during pregnancy. The study conducted in the USA highlighted that midwives and nurses have a great importance for the vaccination of pregnant women.[23] In our study, we found that the pregnant women learnt from the midwives and nurses in the primary care the most that they needed to get tetanus vaccine.

Among the responses given to the question "Where did you learn that you need to get tetanus vaccine during pregnancy?" in the questionnaire, the response "from my obstetrician" given by 0.8% of the population is the most important issue that should be paid attention. While Çelikel et al. reported that approximately one fourth of the pregnant women did not get vaccinated as their doctors did not recommend,[14] another study revealed that the pregnant women did not get vaccinated as they did not know that they needed to get tetanus vaccine and their obstetricians did not inform them.[24] The most important reason for the low rates of recommending tetanus vaccine is the belief of the physicians that all labors would be done in hospitals and under sterile conditions. However, according to 2013 TDHS results, the rate of pregnant women giving birth at hospital is 97% and there is still a population of 2.3% in the country who give birth at home.[21] Therefore, all healthcare professionals and obstetricians in particular should recommend all pregnant women to get tetanus vaccine during pregnancy regardless of the delivery setting.

The studies conducted in Turkey investigated the association of anti-vaccination with socio-demographic data, and these studies[25] reported that tetanus vaccination rates are not associated with age, profession groups, income levels and educational status. However, the study carried out in Italy reported that the compliance to the recommendation for tetanus and influenza vaccines during pregnancy is associated with the socio-demographic data.[26] It has been found that the women with lower educational level were indifferent to the vaccines recommended during pregnancy while the women with higher educational level were more sensitive in terms of understanding and interpreting the information, and taking doctor recommendations more seriously. While the correlations between socio-demographic data and anti-vaccination vary from country to country, we did not compare socio-demographic data and knowledge levels in our study.

One of the limitations of our study is not using a standardized and widely accepted questionnaire. However, we do not consider it as a limiting factor for this issue as there is no universal evaluation system for anti-vaccination. Another limitation is that our study is a single-center study and conducted in a secondary care hospital.

Conclusion

The rate of tetanus vaccination during pregnancy is higher compared to the other vaccines. However, there is still a population that refuses to get vaccinated or not getting vaccination due to the lack of knowledge. The greatest obstacles to the vaccination are the belief that vaccine may harm the baby, and the lack of knowledge about vaccination. The greatest obstacle caused by the healthcare professionals is the lack of providing sufficient information about vaccine, not explaining the necessities of vaccine to patients and the perception of obstetricians in particular that only the primary healthcare organizations are responsible for tetanus vaccine.

Conflicts of Interest: No conflicts declared.

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