KNOWLEDGE LEVEL OF THE MANAGEMENT OF HEPATITIS B DURING PREGNANCY AMONG SPECIALIST AND RESIDENTS OF THE OBSTETRICS AND GYNECOLOGY: A SURVEY STUDY FROM TURKEY

Kadın hastalıkları ve doğum uzmanı ve asistanlarının gebelikte hepatit B yönetimine ilişkin bilgi düzeyi: Türkiye'den bir anket çalışması

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Abstract

In this study, it is aimed to assess the levels of knowledge of specialists and residents of gynecology and obstetrics in Turkey, concerning management of Hepatitis B virus (HBV)-positive pregnant women. A cross-sectional on-line survey study was conducted on Gynecology and Obstetrics specialists and residents between November 2019 and February 2020. Questionnaire form concerning management of HBV-positive pregnant women, which was prepared by researchers on the basis of literature, has been sent to Gynecology and Obstetrics Clinics and departments of Turkey via online means. The questionnaire form consisted of sections including socio-demographic characteristics (age grup, gender, time spent as a specialist doctor/resident (years), place of work) and assessing the level of knowledge concerning the management of HBV(+) pregnant women. The questions in this section were created by the researchers based on the literature. These questions are not questions of a scale whose validity and reliability studies have been conducted. Knowledge Level Score on the management of HBV positive pregnant women (KLS) has been calculated in a range of 0 to 18 points. Statistics Package for the Social Sciences (SPSS) version 25.0 was used for statistical analysis. A total of 215 physicians, including 50 residents (23.3%) and 165 (76.7%) specialists, have participated in the study. Since normal distribution was not observed as a result of normality evaluation, mean values are presented as median (25%-75%). Median KLS was found as 8.0 (7.0-10.0). In residents, KLS was 8.0 (6.75-9.0) and in specialists, it was 8.0 (7.0-10.0). There was no statistically significant difference between the scores of residents and specialists. The median level of knowledge of the physicians participating in the study about Hepatitis B treatment in pregnant women was 8.0 (7.0-10.0). This score was interpreted as “inadequate” out of a maximum of 18 points, by researchers. Despite limitations, this study has shown the inadequacy of level of knowledge of gynecologists and obstetricians in Turkey concerning management of Hepatitis B in pregnant women. There is a need for further studies and continuous training of Gynecologists and Obstetricians.

Keywords: Hepatitis B virus, pregnancy, gynecologists and obstetricians, survey, knowledge.

Özet

Bu çalışmada Türkiye'deki kadın hastalıkları ve doğum uzmanlarının ve asistanlarının Hepatit B virus (HBV) pozitif gebelerin yönetimine ilişkin bilgi düzeylerinin değerlendirilmesi amaçlandı. Kasım 2019 – Şubat 2020 tarihleri arasında Kadın Hastalıkları ve Doğum uzmanları ve asistanları üzerinde kesitsel çevrim içi anket çalışması yapılmıştır. Araştırmacılar tarafından literatüre dayalı olarak hazırlanan HBV pozitif gebelerin yönetimine ilişkin anket formu Türkiye'deki Kadın Hastalıkları ve Doğum Klinikleri ve bölümlerine çevrim içi olarak gönderilmiştir. Anket formu sosyo-demografik özelliklerin (cinsiyet, yaş grubu, uzman/asitan doctor olarak geçirilen zaman (yıl), çalışılan yer) yer aldığı ve HBV(+) gebelerin yönetimine ilişkin bilgi düzeyinin değerlendirildiği bölümlerden oluşmuştur. Bu bölümdeki sorular araştırmacılar tarafından, literatüre dayalı olarak oluşturuldu. Bu sorular geçerlik-güvenilirlik çalışması yapılmış bir ölçeğin soruları değildir. HBV pozitif gebelerin yönetimine ilişkin Bilgi Düzeyi Puanı (BDP) 0 ila 18 puan aralığında hesaplanmıştır. İstatistiksel analiz için SPSS v25.0 paket programı kullanılmıştır. Araştırmaya 50'si asistan (%23,3) ve 165'i (%76,7) uzman olmak üzere toplam 215 hekim katılmıştır. Normalite değerlendirmesi sonucu normal dağılım görülmediğinden ortalama değerler median (%25-%75) olarak sunuldu. Median BDP 8,0 (7,0-10,0) olarak bulundu. Asistanlarda median BDP 8,0 (6,75-9,0), uzmanlarda ise 8,0 (7,0-10,0) idi. Asistan ve uzman öğrencilerin puanları arasında istatistiksel olarak anlamlı bir fark bulunmadı (p: 0,237). Çalışmaya katılan hekimlerin gebelerde Hepatit B tedavisine ilişkin ortanca bilgi düzeyi 8,0 (7,0-10,0) olarak bulundu. Bu puan maksimum 18 puan üzerinden “yetersiz” olarak değerlendirildi. Kısıtlılıklara rağmen bu çalışma Türkiye'deki kadın doğum ve doğum uzmanlarının gebelerde Hepatit B tedavisine ilişkin bilgi düzeylerinin yetersiz olduğunu ortaya koymuştur. Bu konuda daha ileri çalışmalara gerek duyulmaktadır. Kadın Hastalıkları ve Doğum hekimleri için gebelerde HBV enfeksiyonunun yönetimi konusunda sürekli eğitimlerin faydalı olabileceği düşünülmektedir.

Anahtar kelimeler: Hepatit B virüsü, gebelik, kadın hastalıkları ve doğum, anket, bilgi.

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Introduction

Chronic hepatitis B affects approximately 250 million people worldwide and is one of the most important reasons for hepatic cirrhosis and hepatocellular carcinoma (1). Worldwide, more than 2 billion people are infected with Hepatitis B Virus (HBV). Number of chronic carriers is more than 380 million and more than 2 million people die every year due to HBV-associated diseases (2). World Health Organization (WHO) classifies HBV prevalence as high endemicity (>8 %), moderate endemicity (2-7 %) and low endemicity (<2%). Turkey is deemed as a moderate endemicity territory (4, 5). The most effective way of preventing HBV infections is the vaccination. Relying on WHO program, Turkey has included HBV vaccination in routine vaccination schedule in 1998 (6).

Exposure to contaminated blood products, sexual activity or perinatal infection are the transmission routes of HBV. More than half of chronic HBV carriers have been infected through perinatal route. In the United States, prevalence of chronic HBV infection during pregnancy is reported as 0.2 % to 6 %. Therefore, management of chronic HBV infection is a significant opportunity to prevent perinatal transmission of HBV. Pregnant women must be routinely screened for HBV (7, 8).

No studies, measuring the level of knowledge of gynecologists and obstetricians concerning management of HBV infection during pregnancy, were found in Turkey.

The objective of this study is to assess the levels of knowledge of specialists and residents of gynecology and obstetrics in Turkey, concerning management of HBV-positive pregnant women.

Material and Method

This study is a cross-sectional survey study. The period of study was between November 2019 and February 2020. Questionnaire form concerning HBV-positive pregnant women, which was prepared by researchers on the basis of literature, has been sent to Gynecology and Obstetrics Clinics and departments of Turkey via online means. Questionnaire form consisted of a total 29 questions. First section consists of a total 9 questions concerning some socio-demographic characteristics (age grup, gender, time spent as a specialist doctor/resident doctor in years, place of work), duration of work as resident/specialist, and received training concerning monitoring of HBV(+) patient monitoring. In the second section, 18 out of 20 questions, measuring level of knowledge concerning management of HBV(+) pregnant women, have an evidence-based correct answer.

The questions in this section were created by the researchers based on the literature. These questions are not questions of a scale whose validity and reliability studies have been conducted.

For each of these 18 questions, by assigning 1 point to correct answers and 0 to wrong answers, “Knowledge Level Score” has been calculated in a range of 0 to 18 points. Remaining two questions of questionnaire have been asked to inquire the approach of physicians concerning monitoring and vaccination in HBV(+) pregnant women. These two questions have no correct answers. The frequency of answers to questions have been assessed qualitatively.

Feedbacks have been received from 46 out of 81 provinces of Turkey for the questionnaire form, which was sent online. A total of 215 physicians, including 50 residents (23.3%) and 165 (76.7%) specialists, have participated in the study.

Posterior power analysis was performed in the G*Power program. Question 10: “Is it possible to initiate antiviral therapy in Hepatitis B-positive pregnant women to prevent transmission?” When the distribution rates of the question according to groups were taken as Type I error 0.05 and n1 and n2

as 50 and 165 respectively, a two-way hypothesis was established, and the power of the test was calculated as 80.15%.

This study was approved by the local ethics committee of the Tepecik Training and Research Hospital, Izmir, Turkey (No: 2019/18-22). All procedures were in accordance with the ethical standards of the institutional and/or national research committee.

In the analyses of data, Statistics Package for the Social Sciences (SPSS) version 25.0 was used. The normal distribution of the numerical variables was evaluated by the Kolmogorov normality test and Q-Q graphs. The homogeneity of the variances was evaluated by Levene test. It was concluded that normal distribution was not provided. In bivariant analyses, comparison of two means was made with Mann-Whitney U Test and comparison of three or more means was made with Kruuskal-Wallis Analysis. In the analysis of qualitative data, chi square test and Fisher's exact test were used. Correlation analyses were made with Spearman correlation test. Frequency values are given as n (%) and average values are given as median (25%-75%). For statistical significance, $p<0.05$ was adopted.

Results

61.4% of all physicians (n:132) were female. Median age of specialists (38.0 (34.0-44.0) was higher than median age of residents (28.50 (26.75-30.25)) ($p<0.001$). 78% of residents (n:39) and 56.4% of specialists (n:93) were female. Frequency of females was higher in residents compared to specialists (X^2:7.579; p:0.006). For specialists, median time since becoming a specialist was 8.0(3.0-15.0) years. For residents, median time since becoming a resident was 2.0(1.0-3.0) years.

The distribution of physicians by place of work was as follows: 25.6% (n:55) public hospital, 30.7% (n:66) private hospital/private practice, 12.6% (n:62) Education-Research hospital, and 12.6% (n:27) university. There was a difference between specialists and residents according to the place of work (X^2: 84.689; $p<0.001$).

86.5% of physicians (n:186) reported that they previously followed up an HBV(+) pregnant woman. Frequency of physicians, who had followed up HBV(+) pregnant women, was no statistically significantly difference between specialists (88.5%) and residents (80.0%) (X^2:2.373; p:0.305).

The frequency of persons, who had received training on management of HBV-positive pregnant women during specialty training was 47.4% (n:102). The specialists (52.7%) had received training on management of HBV-positive pregnant women at a greater frequency compared to residents (30.0%) (X^2:8.689; p:0.013).

50 of 102 physicians (49.0%), who had received training on management of HBV(+) pregnant women, thought that the training was adequate. There was no statistically significant difference between specialists and residents, who had received training on management of HBV(+) pregnant women, in terms of belief that the training was adequate (X^2:3.767; p:0.152).

Distribution of some of the characteristics of specialists and residents are presented in Table 1.

Distribution of answers to 18 questions, measuring level of knowledge concerning management of HBV(+) pregnant women, between specialists and residents, is given in Table 2 and Table 3.

Table 1: Distribution of some characteristics of the specialist and residents.

Characteristics	Total (N:215) n (%)*	Specialist physicians (N:165) n (%)*	Residents (N:50) n (%)*	Statistical analyses X^2 or t; p
Gender				
Men	83 (61.4)	72 (43.6)	11 (22.0)	7.579;
Women	132 (38.6)	93 (56.4)	39 (78.0)	**0.006**
Institution				
Public hospital	55(25.6)	55 (34.0)	0 (0.0)	
Private institution	66 (30.7)	66 (40.7)	0 (0.0)	84.689;
Research Hospital	62 (28.8)	28 (17.3)	34 (70.8)	**<0.001**
University Hospital	27 (12.6)	13 (8.0)	14 (29.2)	
Missing**	5 (2.3)			
Training on the management of pregnant women with chronic hepatitis B during specialist training				
Yes	102 (47.4)	87 (52.7)	15 (30.0)	8.689;
No	103 (47.9)	70 (42.5)	33 (66.0)	**0.013**
Missing	10 (4.7)	8 (4.8)	2 (4.0)	
Do you find the training you have received on the management of pregnant women with chronic hepatitis B sufficient? (N: 102)				
Enough	50 (49.0)	46 (52.9)	4 (26.7)	3.767;
Insufficient	12 (11.8)	10 (11.5)	2 (13.3)	0.152
I am not sure	40 (39.2)	31 (35.6)	9 (60.0)	

**Column percent, **Missing data not included in chi-square analysis*

Table 2: Comparison of correct answers, given by specialists and residents to questions concerning management of pregnant women with Hepatitis B (Questions 1-8).

	Specialist physicians (N:165) n (%)*	Asistant physicians (N:50) n (%)*	Statistical analyses X^2; p
Question 1: "Do you screen pregnant women you follow, for Hepatitis B?"			
****Correct answer:** "I routinely screen all pregnant women."	1 (0.6)	1 (2.0)	Fisher: 0.412
Question 2: "Which tests do you use in Hepatitis B screening?"			
Correct answer: "HBsAg, AntiHBs, AntiHBc"***	16 (9.7)	8 (16.0)	1.537; 0.215
Question 3: Question 3 "Is it necessary to screen all pregnant women for Hepatitis B in the first trimester?"			
Correct answer: "Yes"	150 (90.9)	43 (86.0)	1.007; 0.316
Question 4: "Is the risk of a chronic infection higher in persons, who are exposed to Hepatitis B Virus at an earlier age?"			
Correct answer: "No"	40 (24.2)	17 (34.0)	1.875; 0.171
Question 5: "Is Hepatitis B vaccine contraindicated in pregnancy?"			
Correct answer: "No"	135 (81.8)	33 (66.0)	5.621; **0.018**
Question 6: "Is exposure of baby to blood and vaginal fluids during birth, the most frequent route of transmission of HBV from mother to child?"			
Correct answer: "Yes"	122 (73.9)	37 (74.0)	0.000; 0.993
Question 7: "Is it necessary to apply caesarean section to prevent transmission from mother to child?"			
Correct answer: "No"	136 (82.4)	36 (72.0)	2.606; 0.106
Question 8: "Is it necessary for Hepatitis B-positive mothers to avoid breastfeeding their children?"			
Correct answer: "No"	134 (81.2)	37 (74.0)	1.226; 0.268

**Column percent **: The distribution of wrong answers was not shown on table.*
****The answers of persons, who marked the three tests, were deemed correct.*

Table 3: Comparison of correct answers, given by specialists and residents to questions concerning management of pregnant women with Hepatitis B (Questions 9-18).

	Specialist physicians (N:165) n (%)*	Residents (N:50) n (%)*	Statistical analyses X^2; p
****Question 9: "Is it necessary to administer vaccine and hyperimmunoglobuline within the first 24 hours to a baby, given birth by a hepatitis B-positive mother?"**			
Correct answer: "No"	0 (0.0)	0 (0.0)	No correct answers. Not analyzed.
Question 10: "Is it possible to initiate antiviral therapy in Hepatitis B-positive pregnant women to prevent transmission?"			
Correct answer: "Yes"	78 (47.3)	12 (24.0)	8.540; **0.003**
Question 11: "For prevention of infection of baby, under which conditions may antiviral therapy be initiated?"			
Correct answer: "HBV DNA>200.000 IU/mL"	7 (4.2)	2 (4.0)	0.006; 0.940
Question 12: "When must prophylactic antiviral therapy be initiated?"			
Correct answer: "Weeks 28-32"	15 (9.1)	3 (6.0)	0.478; 0.489
Question 13: "What is the percentage of HBsAg-positive persons in Turkey?"			
Correct answer: 4 %	49 (29.7)	13 (26.0)	0.256; 0.613
Question 14: "On transmission of Hepatitis B Virus to newborn, what is the risk of infection becoming chronic?"			
Correct answer: 65-90 %	26 (15.8)	8 (16.0)	0.002; 0.967
Question 15: "What are the most frequently seen symptoms in persons with Hepatitis B?"			
Correct answer: "None"***	35 (21.2)	11 (22.0)	0.014; 0.905
Question 16: "Which condition is consistent with HBsAg (-), AntiHBs (+), AntiHBcIgG (+) serological profile?"			
Correct answer: "Previous Hepatitis B with Immune Response."	112 (67.9)	34 (68.0)	0.000; 0.987
Question 17: "Which condition is consistent with HBsAg (-), AntiHBs (+), AntiHBcIgG (-) serological profile?"			
Correct answer: "Vaccinated individual"	107 (64.8)	33 (66.0)	0.022; 0.881
Question 18: "Which condition is consistent with HBsAg (+), AntiHBs (-), AntiHBcIgG (+) serological profile?"			
Correct answer: "Chronic Hepatitis B infection"	113 (68.9)	34 (68.0)	0.015; 0.904

**Column percent **: The distribution of wrong answers was not shown on table.*
**** None of the jaundice, weight loss, fatigue options are among the most frequently seen symptoms in persons with hepatitis B.*

No correct answers were received for Question 9 *"Is it necessary to administer vaccine and hyperimmunoglobulin within the first 24 hours to a baby, given birth by a hepatitis B-positive mother?"*

For Question 1, *"Do you screen pregnant women you follow, for Hepatitis B?"* only 1 of residents and only 1 of specialists answered, "I routinely screen all pregnant women."

Another question with low correct answer frequency was Question 11 *"For prevention of infection of baby, under which conditions may antiviral therapy be initiated?"* 4.2% of specialists and 4.0% of residents gave correct answer: "HBV DNA>200,000 IU/mL" to this question. There was no difference between residents and specialists in terms of correct answer frequency (p:0.940).

There was no difference between specialists and residents with highest correct answer frequency (p>0.05 for each). These questions and their answers are as follows: Question 3 *"Is it necessary to screen all pregnant women for Hepatitis B in the first trimester?"* (Correct answer: Yes); Question 7 *"Is it necessary to apply caesarean section to prevent transmission from mother?"* (Correct answer: No) and Question 8 *"Is it necessary for Hepatitis B-positive mothers to avoid breastfeeding their children?"* (Correct answer: No).

For Question 5 *"Is Hepatitis B vaccine contraindicated in pregnancy?"* correct answer *"No"* was given by 81.8 % of specialists and 66.0 % of residents and there was a statistically significant difference (p:0.018).

For Question 10 *"Is it possible to initiate antiviral therapy in Hepatitis B-positive pregnant women to prevent transmission?"* correct answer *"Yes"* was given by 47.3% of specialists and 24.0% of residents and there was a statistically significant difference (p:0.003).

The participants were asked about their approach on two issues. A particular correct answer was not sought for these questions. First question was: *"What is your approach on detection of chronic hepatitis B in a pregnant woman, followed by you?"* Eleven residents (22.0%) and 54 specialists (33.0%) responded: "If she has high viral load and ALT/AST values, I refer her to related specialist." Thirty-three residents (66.0%) and 94 of physicians (56.9%) said, *"I refer her directly to Infectious Diseases/Gastroenterology Specialist."* Only five (3.03%) specialists responded, *"I recommend a visit to related specialist following pregnancy."* Six residents and 12 specialists did not answer this question.

Second question was *"Do you recommend vaccination to pregnant women with negative Hepatitis B serology?"* Twenty-two (44.0%) residents and 99 (60.0%) specialists responded, *"I do."* Ten residents (20.0%) and 21 specialists (13.0%) responded *"I recommend it after pregnancy due to potential harmful effects on fetus."* Twelve (24.0%) residents and 32 (19.0%) specialists responded, *"I don't."* Six residents and 13 specialists did not answer this question.

For all participants, median knowledge level score for management of Hepatitis B-positive pregnant women was found as 8.0 (7.0-10.0).

In residents, median knowledge level score was 8.0 (6.75-9.0) and in specialists, it was 8.0 (7.0-10.0). There was no statistically significant difference between the scores of residents and specialists.

Median knowledge level score for male physicians was 9.0 (7.0-10.0) and for female physicians, it was 8.0 (7.0-9.0). Median knowledge level score did not differ on the basis of gender (p:0.154).

The presence of a correlation between ages and knowledge level of physicians, was sought. And no correlation was found (r:0.006; p:0.931).

In residents, there was no correlation between the duration of work as resident and knowledge level scores (r:0.070; p:0.633).

In specialists, there was no correlation between the duration of work as specialist and knowledge level scores (r:0.089; p:0.258).

Median knowledge level scores were 8.0 (7.0-10.0) for those who work in state

hospitals, 9.0 (7.0-10.0), for those who work in private institutions, 8.0 (7.0-9.25) for those who work in training and research hospitals and 8.0 (7.0-10.0) for those who work in university hospitals. There was no correlation between the employer institution and median knowledge levels of physicians (p:0.971).

The median knowledge level score (9.0-7.0-10.0) in physicians, who had previously followed Hepatitis B-positive pregnant women, was higher than the median knowledge level score of physicians, who had not previously followed Hepatitis B-positive pregnant women (3.0-0.0-8.0) (p<0.001).

The median knowledge level score (9.0-7.0-10.0) in physicians, who received training on management of Hepatitis B-positive pregnant women during specialty training was not found to be different from the median knowledge level score (9.0-7.0-10.0) of physicians, who did not (p:0.061).

Of 102 physicians, who had received training on management of pregnant women with chronic hepatitis B, the median knowledge level scores of those, who thought that the training was adequate, who thought it was not and who are not sure, are 8.0 (7.0-10.0), 8.0 (7.0-10.0), and 8.0 (7.0-10.0), respectively. There was no statistically significant difference between these groups.

The median knowledge level score of physicians with respect to some of their characteristics, is given in Table 4.

Table 4: Comparison of median knowledge level score of physicians with respect to some of their characteristics.

Some characteristics	Average knowledge level score concerning management of pregnant women with chronic hepatitis B (median (25%- 75%)	Statistical analyses (Mann Whitney U or Kruskal Wallis or Spearman correlation)
Specialist / Resident		
Specialist	8.0 (7.0-10.0)	p:0.237
Resident	8.0 (6.75-9.0)	
Gender		
Male	9.0 (7.0-10.0)	p:0.154
Female	8.0 (7.0-9.0)	
Age (years)		r:0.006; p:0.931
In residents (N: 50) duration of work as resident (years) - average knowledge level score		r:0.070; p:0.633
In specialists (N: 165) duration of work as specialist (years) - average knowledge level score		r:0.089; p:0.258
Employer Institution		
State hospital	8.0 (7.0-10.0)	p:0.971
Private institutions	9.0 (7.0-10.0)	
Training-Research hospital	8.0 (7.0-9.25)	
University hospital	8.0 (7.0-10.0)	
Previous follow-up of pregnant women with Hepatitis B		
Those who have followed	9.0 (7.0-10.0)	**p<0.001**
Those who have not	3.0 (0.0-8.0)	
Receipt of training concerning management of pregnant women with Hepatitis B, during specialty training		
Those who have	9.0 (7.0-10.0)	p:0.061
Those who have not	9.0 (7.0-10.0)	
Among those, who have received training concerning management of pregnant women with Hepatitis B (N: 102), finding the training adequate		
Finds adequate	8.0 (7.0-10.0)	p:0.630
Does not find adequate	8.0 (7.0-10.0)	
Not sure	8.0 (7.0-10.0)	
Average level of knowledge score in overall physicians		8.0 (7.0-10.0)

Discussion

Considering that in Turkey, a country of moderate endemicity for HBV prevalence, more than half of HBV carriers were infected through perinatal route, it is important for Turkish physicians and in particular specialists of gynecology and obstetrics to know how to manage HBV infection during pregnancy (4-8). In a study (11), conducted in Northern Turkey, rate of hepatitis seropositive women was reported as 2.1% in pregnant women. Despite including of Hepatitis B vaccine in routine immunization in Turkey, it is recommended to screen pregnant women routinely. However, in our study, there were only 1 specialist and 1 resident, who said, "I screen pregnant women for Hepatitis B." (Table 2). 193 among all physicians, 96.1% of specialists and 95.7% of residents said, they screened "pregnant women with risky behavior." It was concluded that training on this issue must be given to specialists of gynecology and obstetrics.

A strategy for detection of virus, is to search for surface antigen of Hepatitis B - HBsAg before birth. The US Preventive Services Task Force recommends screening of all pregnant women for HBsAg (12, 13). WHO Guidelines on hepatitis B and C testing, recommends the use of HBsAg, AntiHBs, AntiHBc in order to screen for HBV infection (14). In our study, the frequency of persons, who declared that they used all these three tests, was found to be very low (9.7% in specialists, 16.0% in residents), (Table 2). The reason for this may be the belief of participants that HBsAg test alone was sufficient. Because 91.6% of physicians reported that they used HBsAg test in screening.

It has been reported that 10% of babies, born to women with acute HBV infection in the first trimester were found to be HBsAg positive at birth. In addition, 80-90% of the newborn may be HBsAg-positive without prophylactic treatment in case the mother develops acute infection in the third trimester of pregnancy (15). Under the light of this information, it is appropriate to screen for HBV in first trimester of pregnancy. Our study has shown that about nine-tenths of specialists and residents of gynecology and obstetrics had the knowledge that HBV screening had to be made in the first trimester (Table 2).

In our study, the risk of chronic infection in persons, who had exposure to disease at an early age, was queried. The information that risk of chronic infection would not be higher, was sought. About one-fourth of specialists and one-third of residents responded correctly (Table 2). These response rates may be deemed as "inadequate." It is known that Hepatitis B virus infections becoming chronic thereby yielding progressive consequences, was inversely proportional with age (16).

Although many vaccinations are contraindicated in pregnant women, Hepatitis B vaccine can be administered during pregnancy. It must be noted that there is limited data on safety of Hepatitis B vaccinated in pregnant women (17). 81.8% of specialists and 66.0% of residents responded correctly (Table 2). These response rates may be deemed as "adequate." In this question, higher frequency of correct answer by specialists compared to residents ($p<0.05$), suggests that training of residents of gynecology and obstetrics must be supplemented with the issue of vaccination during pregnancy.

The most frequent route of transmission of HBV is exposure of baby to blood and vaginal fluids during birth (18). In our study, three-fourths of specialists and residents possessed this knowledge and this is a good result (Table 2).

In a study on HBsAg positive mothers, mother-to-child-transmission (MTCT) of HBV in case of vaginal delivery, elective c-section and emergency c-section, was examined (19). Compared to vaginal delivery, C-section had no effect on vertical transmission. Thus, c-section as a method to prevent mother-to-child-transmission, is not appropriate. 82.4% of specialists and 72.0%

of residents have answered this question correctly (Table 2). This positive result shows that a positive attitude is adopted by gynecologists and obstetricians in Turkey against c-section.

In Turkey, the belief “HBV (+) mothers must not breastfeed their children” has been adopted as a false belief (20). For correction of this knowledge, healthcare professionals are expected to attract attention to the issue in healthcare training programs for public. Our study group have provided correct answers to this question at high frequency (81.2% in specialists and 74.0% in residents) (Table 2).

Administration of HB immunoglobulin and HBV vaccine to children on birth (within 12 hours) and then 2 additional vaccines at 6-12 months, prevent 95% of HBV transmissions from HBsAg-positive mothers to children (18, 21). In our study, HB Immunoglobulin and HB vaccine to babies was asked “within the first 24 hours.” The reason for failure of all physicians to answer correctly, is believed to be the failure to consider “first 24 hours” emphasis (Table 3).

The study group was asked, “Is it possible to initiate antiviral therapy in Hepatitis B-positive pregnant women to prevent transmission?” Frequency of correct answers by specialists (47.3%) was higher compared to residents (24.0%) ($p<0.05$). The results of a study, conducted by Pan et al, (22), on a cohort with HBV DNA levels greater than 200,000 IU per milliliter in the third trimester, are as follows: “In patients, receiving tenofovir disoproxil fumarate (TDF) therapy, rate of mother-to-child-transmissions was found to be lower compared to those who do not receive the same.” In our study, the correct answer frequencies for necessity to administer antiviral treatment, were deemed as low.

The most important risk factor in mother-to-child-transmission is mother level of HBV DNA > 200,000 IU/mL. Only 4.2% of specialists and 4.0% of residents answered this question correctly (Table 3). As an explanation for low correct answer frequency, the presence of HBV DNA>2,000 IU/mL and HBV DNA>20,000 IU/mL in options, was deemed as a justification.

According to the results of a meta-analysis study, Brown et al (23), reported that in HBV (+) pregnant women, antiviral therapy must be initiated in weeks 28-32 in the third trimester. Rates of possession of this knowledge were found to be very low in our study, with 9.1% for specialists and 6.0% for residents (Table 3).

It is reported that Turkey was a country with moderate endemicity for HBV and the rate of HBsAg positive persons was about 4% (4, 5). However, possession of this knowledge by 29.7% of specialists and 26.0% of residents, is not adequate for gynecology and obstetrics. (Table 3). This suggests that the physicians, constituting the study population had some information, albeit incomplete, on frequency of Hepatitis B in society.

65% to 90% of babies, born by HBsAg-positive mothers, may become chronic hepatitis B carriers when left untreated. However, more than 80 % of study population have chosen lower frequencies (Table 3). Level of knowledge of study group concerning this issue, is insufficient.

Participants, in the questionnaire form, have answered a question concerning “Most frequently seen symptoms of Chronic Hepatitis B.” Only one-fifth of participants answered this question correctly (Table 3).

In this study, three questions were asked on serological profiles. About two-thirds of physicians knew that “HBsAg (-), AntiHBs (+), AntiHBcIgG (+)” profile was “Previous Hepatitis B with Immune Response” and “HBsAg (-), AntiHBs (+), AntiHBcIgG (-)” profile as “Vaccinated individual” and “HBsAg (+), AntiHBs (-), AntiHBcIgG (+)” profile as “Chronic Hepatitis B infection” (Table 3). However, more than two-thirds of participants were expected to know these profiles. In this sense, it may be said that the participant physicians had inadequate knowledge.

The median level of knowledge of the physicians participating in the study about hepatitis B treatment in pregnant women was 8.0 (7.0-10.0). This score was interpreted as “inadequate” out of a maximum of 18 points, by researchers.

Discussions concerning possible factors, believed to have affected the

knowledge level of study group, have been made. It was seen that being a specialist or a resident made no difference on the level of knowledge concerning management of Hepatitis B in pregnant women ($p>0.05$), (Table 4). These results underline the importance of continuous post-graduate training after specialty training.

In this study, no relationship was found between gender, age, duration of work as a specialist/resident, and level of knowledge (for each $p>0.05$), (Table 4). Also, there was no significant relationship between having training about HBV management in pregnant women and the level of knowledge ($p>0.05$). 102 physicians, who reported to have received a training, were asked a question concerning adequacy of training. It was seen that finding training adequate has no effect on the level of knowledge concerning management of Hepatitis B in pregnant women ($p>0.05$) (Table 4). These results suggest that the quality of training is not adequate as well. During residency, it is necessary to provide continuous training on management of Hepatitis B in pregnant women. Certainly, our study does not cover all gynecologists and obstetricians in Turkey and has low representative power. However, due to lack of another study on this issue, the results of this study have given us clues, pointing to insufficiency of training.

Level of knowledge concerning management of Hepatitis B in pregnant women was found to be higher in physicians, who had previously followed Hepatitis B-positive pregnant women, compared to those who had not ($p<0.05$) (Table 4). This result suggests that practical experience was superior to theoretical knowledge.

Limitations and Strengths

No sampling has been made in this study. As reasons for not performing sampling, voluntary completion of the survey and low participation may be given. However, participation from 46 provinces of Turkey, is a strong point of the study. Another limitation is that the questions used to measure knowledge level do not belong to a scale whose validity and reliability studies have been conducted.

Conclusion

In this study, median level of knowledge concerning management of Hepatitis B in pregnant women was found as 8.0 “inadequate.” There are no differences in terms of level of knowledge between specialists and residents. During specialty training, having training of Hepatitis B management, has not increased level of knowledge. However, following up a pregnant woman with Hepatitis B, is effective on level of knowledge. Despite limitations, this study has shown the inadequacy of level of knowledge of gynecologists and obstetricians in Turkey concerning management of Hepatitis B in pregnant women. There is a need for further studies and continuous training of Gynecologists and Obstetricians.

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