



Evaluation of HBsAg, Anti-HCV, Anti-HIV Seroprevalence and Perinatal Outcomes in Pregnant Women

Gebe Kadınlarda HBsAg, Anti-HCV, Anti-HIV Seroprevalansının ve Perinatal Sonuçların Değerlendirilmesi

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ABSTRACT

Objectives: Vertical transmission of hepatitis B virus, hepatitis C virus, (HBV, HCV) and human immunodeficiency viruses (HIV) infections is an important public health problem. The aim of this study was to determine the rates of hepatitis B, anti-HCV and anti-HIV seropositivities in pregnant women in a city and to evaluate the infections in terms of perinatal outcomes.

Materials and Methods: In this retrospective study, 8,464 patients who gave birth in obstetrics and gynecology clinic were recorded. Seropositivity rates of pregnant women were investigated according to the results of hepatitis B surface antigen (HBsAg), HCV antibody and anti-HIV antibody. The rates were determined according to years and perinatal results and statistical comparison was made.

Results: HBsAg seropositivity in pregnant women included in the study was 2.8 % (n=55) in 2015, 2.2% (n=52) in 2016, 2.3% (n=47) in 2017 and 2.2% (n=49) in 2018. The 4 year average was found to be 2.3% (n=203). There was no significant difference between the years (p>0.05). Among all our patients, 4-year mean anti-HCV seropositivity was 0.57% (n=49) and there was no difference between years (p>0.05). Anti-HIV seropositivity was found to be 0.09% on average, and there was no statistically significant difference over the years (p>0.05).

Conclusion: Since hepatitis B, which is a preventable viral disease, has a risk of transmission during delivery and if it is transmitted to the fetus, it may lead to fatal complications at later ages, it is necessary to screen all pregnant women in terms of HBsAg seropositivity and to include it in an antepartum planning program to protect and treat newborns from infection. Although the transmission rate of HCV is low in the society, considering its clinical course, screening of HCV

ÖZ

Amaç: Hepatit B virüsü, hepatit C virüsü (HBV, HCV) ve insan immün yetmezlik virüsleri (HIV) enfeksiyonlarının dikey bulaşması önemli bir halk sağlığı problemidir. Bu çalışmadaki amaç bir ildeki gebelerde hepatit B, anti-HCV ve anti-HIV seropozitiflik oranlarını belirlemek ve enfeksiyonları perinatal sonuçlar açısından değerlendirmektir.

Gereç ve Yöntemler: Bu retrospektif çalışmada kadın hastalıkları ve doğum kliniğinde doğumu gerçekleştirilmiş 8,464 hasta kayıt altına alınmıştır. Gebelerde seropozitiflik oranları, hepatit B yüzey antijeni (HBsAg), HCV antikoru ve tespit edilen anti-HIV antikoru sonuçlarına göre araştırıldı. Yıllara göre ve perinatal sonuçlara göre oranlar belirlenip istatistiki karşılaştırma yapıldı.

Bulgular: Çalışmaya alınan gebelerde HBsAg seropozitifliği 2015 yılında %2,8 (n=55), 2016 yılında %2,2 (n=52), 2017 yılında %2,3 (n=47) ve 2018 yılında ise %2,2 (n=49) bulunmuş olup 4 yıllık ortalaması %2,3 (n=203) olarak hesaplanmıştır. Yıllar arasında anlamlı bir farklılık gözlenmemiştir (p>0,05). Tüm hastalarımız içinde dört yıllık ortalama anti-HCV seropozitifliği %0,57 (n=49) olup yıllar arasında fark bulunmadı (p>0,05). Anti-HIV seropozitifliği ortalama olarak %0,09 olarak saptanmış olup yıllara göre istatistiki anlamda bir farklılık izlenmemiştir (p>0,05).

Sonuç: Önlenebilir bir viral hastalık olan hepatit B'nin doğum esnasında bulaş riski olduğundan ve fetusta bulaş olursa ilerleyen yaşlarda ölümcül komplikasyonlara yol açabileceğinden tüm gebelerin HBsAg seropozitifliği açısından taranması ve bunun bir antepartum planlama programına dahil edilmesi yenidoğanların enfeksiyondan korunması ve tedavi edilmesi için gereklidir. HCV'nin toplumda bulaş oranı düşük bir düzeyde olmasına karşın klinik

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ABSTRACT

together with HIV in risky groups and pregnant women antibody positivity is considered important for the health of the society and newborns.

Keywords: Seroprevalance, pregnancy, HBsAg, anti-HCV, anti-HIV, perinatal outcomes

ÖZ

seyri dikkate alındığında riskli gruplarda ve gebelerde HIV ile birlikte taranması toplum ve yenidoğan bebeklerin sağlığı için önemli görülmektedir.

Anahtar Kelimeler: Seroprevalans, gebelik, HBsAg, anti-HCV, anti-HIV, perinatal sonuçlar

Introduction

Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections seen worldwide are still important infectious diseases today. Hepatitis is the most common infection in our country and HBV, which is the leading one, is a major health problem (1,2). Although there are many ways of transmission of hepatitis B, it is a viral agent that can be transmitted most frequently with infected body fluids, through permucosal or percutaneous contact. Viral encounter can occur between individuals living in the same house through sexual or parenteral transmission, with vertical transition from mother to baby, and horizontal transmission (3). Since almost half of the carriers receive HBV in the perinatal period, transmission from mother to baby draws attention as an important way of transmission of this virus (4). Perinatal transmission is rarely seen after birth, and it is known that 5-10% is transplacentally. Transition from mother to baby usually occurs during birth and 70-90% of these babies can be chronic carriers (5). In our country, which is in a moderately endemic region and has an hepatitis B surface antigen (HBsAg) seroprevalence rate of 3.9-12.5%, regional differences can be observed (6).

It is known that millions of people around the world have HCV infection. It has been reported that the risk of transmission to the baby is less than 5% in mothers who are positive after the HCV-RNA test. There is no special protection method to prevent perinatal transmission of HCV. However, pregnant women with a high viral load can infect newborns and the infection can become chronic in babies who develop acute infection (7). The number of anti-human immunodeficiency virus (anti-HIV) positive cases reported each year in Turkey is increasing. It is seen that approximately 0.8% of HIV cases are transmitted from infected mother to baby (8). Although the benefits of the measures to prevent the perinatal transmission of HCV have not been fully determined today (9), it is recommended to screen patients who come for pregnancy follow-up, as the measures to be taken during pregnancy may reduce the risk of transmission for hepatitis B and HIV (10). HCV antibodies (anti-HCV) for HCV, HBsAg for HBV, HIV antibodies (anti-HIV) for HIV are markers screened in the blood.

It is important to know the presence of viruses in early interventions in babies with a healthy follow-up of pregnant women and in deliveries with seropositivity. The aim of this study is to determine the rates of hepatitis B, anti-HCV and anti HIV seropositivity in pregnant women in a province and to evaluate the infections in terms of perinatal outcomes.

Materials and Methods

Eight thousand four hundred and sixty four pregnant women who were delivered in the Gynecology and Obstetrics Clinic of

Van Training and Research Hospital between January 1, 2015 and December 31, 2018 were included in the study. HBsAg, anti-HCV and anti-HIV seropositivity rates were examined by ELISA method in pregnant women. Age, abortion, parity, gravida number, birth weight, gestational age, and demographic characteristics were recorded retrospectively by archive registry scanning. In the study, patients who were anti-HIV positive in ELISA results were detected during delivery. With the recommendation of this group of patients to the prenatal infectious diseases clinic, HIV-RNA tests were taken immediately, antiretroviral treatment was initiated, and their deliveries were carried out by cesarean section. Postnatal antiretroviral treatment and follow-up were carried out by the infectious diseases clinic.

Patients with positive HBsAg values were detected during delivery. Emergency deliveries of this patient group were realized and HBV-DNA, HBeAg positivity, treatment, and follow-up were carried out by the infectious diseases clinic in the postpartum period.

Ethics committee approval was obtained for the study from Van Ministry of Health University Training and Research Hospital Clinical Research and Ethics Committee with the decision number of 2019/05 and dated 07-03-2019. Written informed consent was obtained from the patients included in the study and our study was conducted in accordance with the Declaration of Helsinki Principles.

Statistical Analysis

Data were analyzed using (SPSS) 20.0. Student's t-test was used for comparing the means between independent groups, and the chi-square test was used to compare categorical variables. Descriptive statistical methods (number, mean, standard deviation) were used. $P < 0.05$ was considered significant.

Results

Eight thousand four hundred and sixty four pregnant women between the specified dates were included in the study. Mean delivery week of the pregnant women participating in the study is 38.5 ± 3.3 weeks. The average birth weight of babies is $3,156.6 \pm 547.8$ grams. HBsAg seropositivity in pregnant women included in the study was found to be 2.8% ($n=55$) in 2015, 2.2% ($n=52$) in 2016, 2.3% ($n=47$) in 2017 and 2.2% ($n=49$) in 2018 and the 4-year average was found to be 2.3% ($n=203$). There was no statistically significant difference between the years in terms of HBsAg positivity ($p > 0.96$). Anti-HCV seropositivity in pregnant women included in the study was found to be 0.4% ($n=9$) in 2015, 0.5% ($n=13$) in 2016, 0.5% ($n=12$) in 2017 and 0.6% ($n=15$) in 2018. The 4-year average was found to be 0.57% ($n=49$). There

was no statistically significant difference between the years in terms of anti HCV positivity ($p>0.63$). Anti-HIV seropositivity in pregnant women included in the study was found to be 0.05% ($n=1$) in 2015, 0.08% ($n=2$) in 2016, 0.14% ($n=3$) in 2017 and 0.09% ($n=2$) in 2018, the average was found to be 0.09% ($n=8$). There was no statistically significant difference between the years in terms of anti HIV seroprevalence ($p>0.74$). The distribution of HBsAg, anti-HCV and anti-HIV values and the number of births by years is shown in Table 1 and Figure 1.

According to age groups, HBsAg ($n=8,464$) seroprevalence was determined as 2.5%, 2.4%, 2.4% and 2.3%, respectively. Anti-HCV seroprevalence ($n=8,464$) was determined as 0.4%, 0.6%, 0.5%, and 0.5%, respectively, according to age groups.

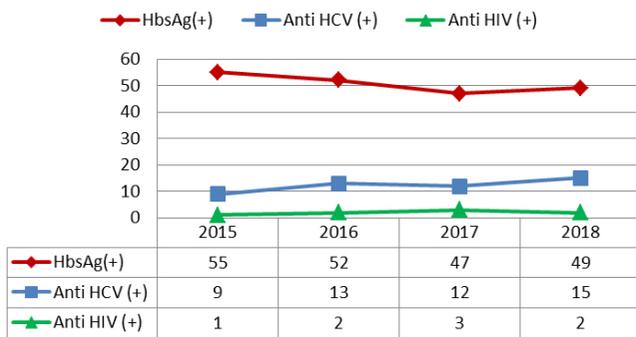


Figure 1. Distribution of HBsAg (+), anti-HCV (+), anti-HIV (+) births by years

HBsAg: Hepatitis B surface antigen, HCV: Hepatitis C virus, HIV: Human immunodeficiency virus

Anti-HIV seroprevalence was found to be 0.07%, 0.07%, 0.07% and 0.15%, respectively, according to age groups. There was no statistically significant difference between age groups and HBsAg, anti-HCV and anti-HIV positive/negativity ($p>0.43$, $p>0.23$, $p>0.26$, respectively) (Table 2).

There was no statistically significant difference between HBsAg, anti-HCV, anti-HIV positivity/negativity according to some perinatal variables (abortion, parity, gravida, gestational week and birth weight) ($p>0.05$) (Table 3).

Discussion

When looking at the distribution of HBV infection in the world, where Turkey is in the middle endemic group, there are three endemic regions: low, medium and high (6). Hepatitis B vaccination was put into the vaccination program by many countries and there was a significant reduction in the disease there. However, in countries without hepatitis B vaccination program, the disease is still seen at high rates. In our country, as in most countries, the frequency of hepatitis B has decreased significantly over the years after the vaccination program was implemented (11). Horizontal and perinatal infection have been reported as the most important infectious pathways of hepatitis B infection. With the addition of low socioeconomic environment and poor hygiene conditions to crowded and public environments such as domestic, nursery, school, prisons, boarding school and kindergarten, the rate of infection increases even more (12).

Chronic HBV infection due to mother-to-child transmission in the perinatal period continues to be an important global health problem. Despite the standard passive-active immunoprophylaxis

Year	HBsAg (+) n (%)	HBsAg (-) n (%)	p	Anti-HCV (+) n (%)	Anti-HCV (-) n (%)	p	Anti-HIV (+) n (%)	Anti-HIV (-) n (%)	p	Total
2015	55 (2.8)	1864 (97.2)	0.96	9 (0.4)	1910 (99.6)	0.63	1 (0.05)	1918 (99.95)	0.74	1919
2016	52 (2.2)	2308 (97.8)		13 (0.5)	2347 (99.5)		2 (0.08)	2358 (99.92)		2360
2017	47 (2.3)	1983 (97.7)		1 (0.5)	2018 (99.5)		3 (0.1)	2027 (99.9)		2030
2018	49 (2.2)	2106 (97.8)		1 (0.6)	2140 (99.4)		2 (0.09)	2153 (99.91)		2155
Total	203 (2.3)	8261 (97.3)		4 (0.5)	8415 (99.5)		8 (0.09)	8456 (99.91)		8464

HBsAg: Hepatitis B surface antigen, HCV: Hepatitis C virus, HIV: Human immunodeficiency virus

Age	HBsAg (+) n (%)	HBsAg (-) n (%)	p	Anti-HCV (+) n (%)	Anti-HCV (-) n (%)	p	Anti-HIV (+) n (%)	Anti-HIV (-) n (%)	p	Total
<20	97 (2.4)	3,810 (97.5)	0.43	24 (0.6)	3,891 (99.3)	0.23	3 (0.07)	3,912 (99.93)	0.56	3,915
>20	65 (1.4)	4,331 (98.6)		25 (0.6)	4,412 (99.4)		5 (0.1)	4,432 (99.9)		4,437

HBsAg: Hepatitis B surface antigen, HCV: Hepatitis C virus, HIV: Human immunodeficiency virus

Table 3. HBsAg, anti-HCV and anti-HIV distribution according to abortion, parity, gravida, gestational week and birth weight

	HBsAg (+) (mean ± SD)	HBsAg (-) (mean ± SD)	p	Anti-HCV (+) (mean ± SD)	Anti-HCV (-) (mean ± SD)	p	Anti-HIV (+) (mean ± SD)	Anti-HIV (-) (mean ± SD)	p
Abortion (n)	1.2±0.3	0.9±0.2	0.67	1.1±0.4	0.9±0.5	0.54	0.8±0.2	0.7±0.1	0.43
Parity (n)	2.0±0.2	1.9±0.7	0.45	2.3±0.6	1.7±0.3	0.34	2.2±0.5	2.0±0.5	0.37
Gravida (n)	2.5±1.4	2.3±1.1	0.43	2.8±0.5	2.6±1.4	0.38	3.3±1.1	2.8±0.7	0.21
Gestational week	39.3±2.5	38.4±3.6	0.21	38.6±3.1	38.4±2.6	0.17	38.4±3.6	37.6±2.3	0.52
Birth weight (gr)	3292.2±337	3284.3±643	0.12	3333.5±323	3300.5±232	0.26	3233.4±323	3404.4±245	0.15

HBsAg: Hepatitis B surface antigen, HCV: Hepatitis C virus, HIV: Human immunodeficiency virus, SD: Standard deviation

with hepatitis B immunoglobulin (HBIG) and hepatitis B vaccine in newborns, up to 9% of newborns are still infected with HBV. Chronic HBV infection due to transmission from mother to child in the perinatal period is an important global health problem. Standard passive-active immunoprophylaxis with HBIG and HBV vaccine in newborns within 12 hours after birth has proven successful in protecting approximately 90% of newborns from perinatal transmission of HBV (13).

Considering the studies conducted on pregnant women around the world, the prevalence of chronic hepatitis B was found to be 5% on average. Depending on the endemic situation in the region, it can be seen at different rates from 0.6% to high rates exceeding 20% (14,15).

HBsAg rate in pregnant women in studies on hepatitis B prevalence in pregnant women in Turkey was determined to be 4.7%. It was stated that pregnant women should be screened for HBV in order to protect newborns from hepatitis B infection (16). In another study covering the period 2001-2009, they found the hepatitis B carrier rate in pregnant women to be 2.5% (17). In a comprehensive study involving 90351 pregnant women, it was stated as 2.1% HBsAg positivity and it was recommended that hepatitis B examination be performed for every pregnant who comes to follow up (18). In a nationwide study conducted on 20,472 people between 1987-1998, HBsAg and anti-HBs positivity were reported as 4.4% and 23%, respectively. In another nationwide study conducted between 1998 and 2012, 4.3% of the 41,107 people tested were HBsAg-positive (19). In the study conducted with 9,420 pregnant women, HBsAg was found positive in 4.7%, anti-HBs in 38.4%, and anti-HCV in 0.286% of pregnant women (20). In a 20-year evaluation study; 7,605 pregnant women were tested, HBsAg prevalence was 1.5% and anti-HBs positivity was 11.5%, respectively (21). In the study in which 35,295 pregnant women were tested; HBsAg and anti-HBs levels were positive in 425 (1.2%) and 9,583 (27.7%) patients, respectively. In this study, it is stated that from 2013 to 2016, HBV carrier rates decreased from 1.4% to 0.8%, while anti-HBs positivity increased from 25.4% to 30.2% (22).

In our study, HBsAg positivity rates were 2.8% in 2015, 2.2% in 2016, 2.3% in 2017, and 2.2% in 2018. The four year average positivity rate is 2.3%, which is consistent with the literature and supports the fact that we are in the middle endemicity region. Although there are regional differences in these studies, it is seen that the rate of carrier has decreased over the years. The low rate in our study may be related to the increase in social awareness

with the spread of hepatitis B vaccine and its inclusion in the routine vaccination program. In addition, the catch-up vaccination initiated after the hepatitis B vaccine was included in the national vaccination program may have also contributed to the decrease in these rates.

Hepatitis B vaccines, which are typically used in three doses, have been included in the routine vaccination program in Turkey since August 1998. While it is administered in 3 (three) doses in the normal administration scheme, vaccination is recommended at 0, 1, 2, and 12. months for people with infection risk. Considering the risk of perinatal transmission, HBIG should be administered in addition to hepatitis B vaccine in the first 24 hours in the postpartum period to newborns from HBV-infected mothers (23).

All babies born from HBsAg positive mothers born in our clinic were consulted by pediatricians. These babies were given HBIG in addition to hepatitis B vaccine. In addition, infected mothers were followed up by infectious diseases physicians.

Since there is no vaccine and antiviral treatment that can reduce the vertical transmission of the infection in pregnant women with anti-HCV positivity, the necessity of routine testing during pregnancy is discussed. However, it has been reported that conditions such as cesarean section and not breastfeeding in elective conditions do not reduce the vertical transmission of HCV infection (9). Considering the studies conducted abroad on anti HCV seropositivity, the seroprevalence in Burkino Faso was determined to be 5.4% and it was stated that this viral agent was mostly transmitted by sexual intercourse (24). In the study conducted on pregnant women in Switzerland, a rate of 0.71% was found (25). There are many studies on anti-HCV positivity in pregnant women in our country. Anti-HCV positivity was detected as 0.6% in the study of Gönen (26) In the study covering 2006-2012, the anti-HCV rate in pregnant women was found to be 0.5% (27). The anti-HCV positivity rate in Turkey has been reported to be in the range of 0-1.5% in the general population and 0-2.04% in pregnant women (28).

In our study, anti-HCV rates in all pregnant women were 0.4% in 2015, 0.5% in 2016, 0.5% in 2017 and 0.6% in 2018. The average four year anti-HCV rate is 0.5%. There was no difference between the years and it is compatible with the literature.

Prevention of HIV transmission from mother to newborn is possible by screening the mother during pregnancy, antiviral treatment and prophylaxis applied to the newborn after birth. Especially pregnant women in the risk group should be screened in HIV-endemic regions (29). Since there is a high risk of transmission

to the baby during delivery in infected mothers with HIV positivity, early diagnosis of HIV and rapid initiation of treatment is of great importance as it may prevent transmission to the baby. It is important to take measures such as starting antiretroviral therapy immediately after diagnosis, planning the delivery method by cesarean section and not breastfeeding the baby in the postpartum period (30) Özlü et al. (27) could not detect a positivity in their study. Madendağ et al. (18) detected a positivity of 0.004 % in their study. In a recent study, all 7,113 pregnant women screened for HIV had negative results (22).

Although there are not enough studies on the subject in our country, it is observed that anti-HIV positivity is low in studies. In the study, the average of four-year anti-HIV positivity was 0.09%, and the rate ranged from 0.05% to 0.14% according to years. The positivity rates are similar to the low case rates detected in our country.

In our study, no significant difference was found between age groups in terms of HBsAg, anti-HCV and anti-HIV seropositivity. This finding indicates that all age groups may be at similar risk for these infections. Similarly, in a study performed on 5,894 patients, no significant difference was found between age groups in terms of HBsAg and anti-HCV seropositivity (31). In the literature, it is stated that the anti-HCV positive patient group is mostly in the advanced age groups (32,33) We think that the reason for the lack of difference between age groups in our study is that the pregnant women in reproductive age who gave birth were in a certain age range.

Considering the studies conducted on HBsAg, anti-HCV and anti-HIV seropositivity in our country, it is seen that studies on the relationship between these infections and pregnancy conditions such as gravida, parity, abortion, birth weight and gestational week are not sufficient. Since all pregnant women in our study were followed-up in our outpatient clinics and their deliveries were carried out in the maternity ward of our clinic, the data were reached safely. In our study, no statistically significant difference was observed between HBsAg, anti-HCV and anti-HIV positivity rates and important perinatal outcomes such as abortion, gravida, parity number, birth weight and gestational week among all pregnant women. In a study conducted in our country, it was reported that there was no significant difference between the HBsAg and anti-HCV groups in terms of abortion, gravida, parity and the number of living children (34).

Study Limitation

The results of the research are valid only for the group in which the research was conducted cannot be generalized.

Conclusion

We think that all pregnant women should be screened for HBsAg, anti-HCV and anti-HIV serology during pregnancy follow-up. Babies born from HBsAg positive mothers should receive HBIG in addition to the postnatal vaccine. Although the transmission risk of HCV is low, we recommend screening pregnant groups in terms of the health status of the society and newborns. In addition, in case of detection of anti HIV positivity, anti HIV testing may be recommended, especially in risky groups, since it is an antiretroviral treatment option. In addition, we think that it would be appropriate

to examine HBsAg, anti-HCV and anti-HIV tests at the first examination in pregnant women with low socio-economic status and coming from rural areas. In addition to all these, we believe that it would be beneficial to know the HBsAg, anti-HCV and anti-HIV serologies of the patients in order to protect obstetricians and gynecologists from these viruses.

Ethics

Ethics Committee Approval: Ethics committee approval was obtained for the study from Van Ministry of Health University Training and Research Hospital Clinical Research and Ethics Committee with the decision number of 2019/05 and dated 07-03-2019.

Informed Consent: Written informed consent was obtained from the patients included in the study and our study was conducted in accordance with the Declaration of Helsinki Principles.

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Authorship Contributions

Surgical and Medical Practices: K.U., İ.Ç., T.U., Concept: K.U., İ.Ç., T.U., Design: K.U., İ.Ç., T.U., Data Collection or Processing: K.U., İ.Ç., T.U., Analysis or Interpretation: K.U., İ.Ç., T.U., Literature Search: K.U., İ.Ç., T.U., Writing: K.U., İ.Ç., T.U.,

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