Analysis of HbsAg positivity rate before and after vaccination in Turkish and Syrian refugee pregnant women

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Abstract
Introduction: In this study, we aimed to investigate the vaccination rate in Turkish and Syrian pregnant women who gave birth in our hospital, research the difference before and after vaccination, compare these results with other studies conducted in our country and be beneficial to physicians in the follow up of this patient group, who we started to encounter rather frequently in recent months.
Methodology: The data of pregnant women who were referred to Kanuni Sultan Suleyman Education and Research Hospital between January and December 2015 were retrospectively investigated.
Results: A total of 4186 pregnant women, 2158 of Syrian and 2028 of Turkish, were included in this study. The rate of hepatitis B surface antigen (HbsAg) positivity was 1.4% among all pregnant women. This value was found to be 1.8% among Turkish women and 1.1% among Syrian women. Evaluation of age distribution showed that there were 30 Turkish pregnant women born after the inclusion of vaccine into the program (1998 and later), of which one was HbsAg positive. While out of 958 Syrian women born in 1991 and later, 10 were HbsAg positive.
Conclusion: This study shows that the surveillance of hepatitis among pregnant women, including refugees and locals is important to protect fetus and guide in planning of preventive measures such as administration of vaccines and immunoglobulins. Timely prevention may decrease morbidity and mortality caused by hepatitis viruses.

Key words: HBV; pregnant; vaccine.

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Introduction
Viral hepatitis is still an important public health issue and approximately two million people in the world are reported to be infected with HBV. The rate of HBV carriership varies, and recently, regional distinction has been made in order to determine the prevalence of this infection [1].

Positivity rate of HBsAg in pregnant women varies according to geographical area and ethnicity. In pregnancy, HBV DNA levels may change due to hormonal effects and mother-to-baby transmission may be seen in utero, during birth or after birth. The perinatal transmission of HBV causes complications such as chronic infection and cirrhosis; and chronicity rates are much higher. The results of liver function test and HBV DNA levels must be monitored closely during pregnancy in order to determine the progress of the liver disease in HBV infected patients [2].

Migrations due to wars in the world cause the death of many, increase poverty, ease the spread of disease and increase health problems. Clashes in Syria cause people to flee the country and take refuge in Turkey and other counties. Along with many problems, issues arise in healthcare services, which firstly affect women in reproductive age, pregnant women and newborns [3].

According to Syrian data, prevalence of HBV was 5.62%. Hepatitis B vaccine was first included in the Extended Vaccination Program (EVP) in 1998 in Turkey and in 1991 in Syria. Syria was one of the first countries in middle east to include Hepatitis B in their vaccination program; however, comparing the rate of adult vaccinations with children, it is seen that the success achieved is not the same [4-8].

In this study, we aimed to investigate the vaccination rate in Turkish and Syrian pregnant women who gave birth in our hospital, research the difference before and after vaccination, compare these results with the other studies conducted in our country and be beneficial to physicians in the follow up of this patient
group, who we have started to encounter rather frequently in the recent months.

Methodology

In this study, the data of pregnant women who were referred to Kanuni Sultan Suleyman Education and Research Hospital between January and December 2015 were retrospectively investigated. 4186 pregnant women were included in the study. The patients were divided into two groups based on their nationalities: Turkish and Syrian pregnant women. Also, taking into consideration the inclusion date of HBV vaccine into the vaccination program, the Syrian pregnant women were divided into two groups as those born before and after 1998. Hepatitis B surface antigen in the patients’ sera were determined with enzyme immunoassay method (ELISA) using Roche Cobas E-411 (Roche Diagnostics, Mannheim, Germany) equipment, in accordance with the automatic procedure suggested by the manufacturer.

Results

A total of 4186 pregnant women, 2158 of which were Syrian and 2028 of which were Turkish, were included in this study. Overall rate of HBsAg positivity was 1.4%. This value was found to be 1.8% among Turkish women and 1.1% in Syrian women (Table 1).

Evaluation of the age distribution showed that there were 30 Turkish pregnant women born after the inclusion of the vaccine into the program (1998 and later), of which 1 was HBsAg positive, and 958 Syrian women born in 1991 and later, of which 10 were HbsAg positive (Table 2).

Discussion

Due to the clear determination of the factors of viral hepatitis, these infections can safely be followed up and diagnosed. Prevalence varies in different geographic regions; and due to HBV vaccinations, diseases related to HBV are decreased even in areas of high prevalence. HBV may be transmitted by body fluids, but vertical transmission from mother to babies is more common in endemic countries [1].

National Vaccination programs vary during the year and from country to country. Epidemiological conditions of the disease in a country are among the affecting factors. The national data as well as the recommendations of the World Health Organization are effective in creating the vaccination programs. In Turkey, this vaccine was first included in EVP in 1998. It is a part of the national vaccination programs in 83% of the countries around the world [4].

In majority of the Middle Eastern countries, hepatitis B virus (HBV) infection is still an important public health issue. According to Syrian data [6], the general prevalence of HBV is 5.62%, while the city of Aleppo has the highest infection rate with a prevalence of 10.6%. The Hepatitis B vaccine has been included in the Extended Vaccination Program of Syria in 1991. In Muselmani et al.’s [7] study on 3896 blood donors in 2014, 66 were found to be HBsAg positive, while 402 of 3896 donors (10.32%) were HBsAg-negative and anti-HBc positive.

The transmission risk of HBV to the fetus is low because of the placental barrier. Vertical transmission is more likely to be seen during birth. Early membrane rupture, spontaneous abortions and contact with the mother’s vaginal secretions increase the vertical transmission risk of HBV. HBV DNA levels in

Table 1. HBsAg positivity rates of Turkish and Syrian Pregnant Women.

|                        | Turkish pregnant women (n = 2028) | Syrian pregnant women (n = 2158) | Total (n = 4186) |
|------------------------|-----------------------------------|----------------------------------|-----------------|
|                        | n       | %    | n       | %    | n       | %    |
| HBsAg Positive         | 36      | 1.8  | 24      | 1.1  | 60      | 1.4  |
| HBsAg Negative         | 1992    | 98.2 | 2134    | 98.9 | 4126    | 98.5 |

Table 2. HBsAg positivity rates between Turkish and Syrian Pregnant Women before and after Vaccination.

|                        | Turkish pregnant women | Syrian pregnant women |
|------------------------|------------------------|-----------------------|
|                        | Those born in 1998 and later | Those born in 1997 and before | Total |
|                        | Those born in 1991 and later | Those born in 1990 and before | Total |
| Total                  | 29                     | 1999                | 2028 | 948     | 1210 | 2158 |
| HBsAg Positive         | 1                      | 35                  | 36   | 10      | 14   | 24   |
maternal serum are the most important indicator and risk factor for transmission [9].

Many problems arise with the increasing number of refugees both in our country and around the world. Many people were forced to leave their country or migrate to other cities within the country due to ongoing war in Syria for the last 4 years. Along with many other problems, infection and malnutrition have become major issues for these people [10].

In our study, the HBsAg rate in total and among Turkish and Syrian pregnant women were determined to be 1.4%, 1.8% and 1.1% respectively; and these rates were seen to be close to the results of other studies, albeit slightly lower. We believe that this may be caused by regional differences and the differences in the ratios of vaccinated groups. The rates are seen to vary by region in some of the studies conducted in our country. The results of some of these studies are presented in Table 3.

### Conclusions

As a result, taking into consideration the increasing number of Syrian refugees, we believe it is important to know the prevalence of hepatitis among pregnant women, including refugees and locals, to protect the babies to be born, plan initiatives such as the vaccines and immunoglobulins to be administered after birth and decrease the morbidity and mortality these viruses may cause.

### References

1. Tosun S (2013) Epidemiology of Viral Hepatitis B Meta-analysis of Publications in Turkey. In Tabak F, Tosun S editors. Viral Hepatitis 2013, Tip Publisher. Istanbul. 25-81.

2. Saltoğlu N (2013) Gebelik ve kronik hepatitler. In Tabak F, Tosun S editors. Viral Hepatitis 2013. 1. baskı. İstanbul. 499-510

3. Şimşek Z, Yentür Doni N, Doğan F, Hilali NG, Yıldırım Kayaya G (2015) Iron B12 and Folate Deficiency in Syrian Refugee Women in The Age of Reproduction in A Provincial Center. Proceedings of 18th National Public Health Congress (pp 291-292), Konya.

4. Özçift EN (2008) Progress in the national immunization practices in the World and in Turkey. Çocuk Sağlığı ve Hastalıkları Dergisi 51: 168-175

5. Ibrahim N, Idris A (2014) Hepatitis B awareness among medical students and their vaccination status at Syrian private university hepatitis research and treatment. Hepat Res Treat 131920.

6. Yacoub R, Al Ali R, Moukeh G, Lahdo A, Mouhammad Y, Nasser M (2010) Hepatitis B vaccination status and needle stick injuries among healthcare workers in Syria. J Glob Infect Dis 2: 28-34.

7. Muselmanni W, Habbal W, Monem F (2014) Prevalence of “anti-HBc alone” among Syrian blood donors. J Infect Dev Ctries 8: 1013-1015. doi:10.3855/jidc.3827 8.

8. Karim M and Lahham H (2008) Prevalence of viral hepatitis B and C in Syria. Syrian Epidemiol Bul 3: 10-11

9. Aktuğ-Demir N, Asan A, Ayaz C, Çelen MK, Köse Ş, Kuruözüm Z, Örmen B, Saltağlu N, Sayan M, Sirmatel F, Tekin-Koruk S, Tülek N, Türker N, Ural O, Yazed U (2013) Management of chronic hepatitis B in pregnancy: a consensus report of the study group for viral hepatitis of the Turkish society of clinical microbiology and infectious diseases. Klimik Jounal 26: 12-19

10. Sever ÖN, Petekkaya I, Çırák Y, Ürün Y (2015) Evaluation of treatment related toxicities and treatment adherence in Syrian refugees with cancer ACU. J Health Sci 4: 216-219

11. Kuru U, Turan O, Kuru N, Saglam Z, Ceylan Y, Nurulõluoğlu M, Agacifidan A (1996) Prevalence of hepatitis B virus infection in pregnant Turkish women and their families. Eur J Clin Microbiol Infect Dis 15: 248-251.

12. Gül A, Türkoğlu MK, Zeteröglu S (1998) The prevalence of hepatitis B and C group of pregnant women. Partnam Derg 6: 67-69.
13. Sırmatel F, Bozkurt Aİ, Karslıgil T, Çakmak A, Geyikli İ (2008) Hepatitis B in pregnant women and results of follow up of immunized children whose mothers are hepatitis B surface antigen positive Med J Bakirkoy 4: 31-33.
14. Madendağ Y, Çol Madendağ İ, Çelen Ş, Ünlü S, Danışman N (2007) Seroprevalence of Hepatitis B, Hepatitis C and HIV at whole Obstetric and Gynecologic Patients who Applplied Our Hospital. Türkiye Klinikleri J Gynecol Obst 17: 442-446.
15. Kölgelier S, Güler D, Demirslan H (2009) The prevalence of HBsAg and Anti-HCV in pregnant women in Adiyaman, Dicle Med J 3: 191-194
16. Atılgan R, Kavak SB, Çelik B (2009) The ratio of hepatitis B and hepatitis C seropositivity in pregnant. Turkish Clinics J Gynecol Obst 19: 34-37
17. Uyar Y, Cabar C, Balci A (2009) Seroprevalence of hepatitis B virus among pregnant women in northern Turkey. Hepatitis Monthly 9: 146-149.
18. Api O, Bektaş M, Akıl A, Api M, Battrel A, Bayer F, Ünal O (2009) Hepatitis B virus seroprevalance in the pregnant population admitting to an education and research hospital in Istanbul. J Turk Soc Obstet Gynecol 6: 103-110
19. Eser Karlıdağ G (2011) HBsAg seroprevalence in pregnant women admitted to a hospital in central of Elazığ. Firat Uni Med Jour of Health Sci 25: 111-113
20. Araz NC, Dikensoy E (2012) Seroprevalence of hepatitis B among pregnant women in Southern Turkey. J Pak Med Assoc 61: 176-177.
21. Coşkun Eİ, Dinçgez B, Genç Koyucu R, Aynoğlu YA, Yumru AE (2011) The Incidence of HBSAg, Anti-HBS and Anti-HCV in Pregnant Women. Perinatal J 19: 71-75
22. Deveci Ö, Yula E, Özer TT, Tekin A, Kurkut B, Durmaz S (2011) Investigation of intrauterine transmission of Hepatitis B Virus to children from HBsAg-positive pregnant women. Journal of Microbiology and Infectious Diseases 1: 14-16
23. Çakmak B, Karataş A (2012) Sero-positivity ratios of hepatitis B and C in pregnant women living in Kocaeli region. Medical Journal of Selçuk 28: 80-82
24. Özlı T, Taş T, Fırat Zafer Mengeloğlu Z, Koçoğlu E, Dönmez ME (2013) Frequency of HBsAg, anti-HCV, and anti-HIV in pregnant women and/or patients with gynecologic diseases in a tertiary hospital. J of Clin Exp Invest 4: 166-170
25. Özcans Dağ Z, Gül S, İşık Y, Tulmaç ÖB, Şimşek Y (2015) Hepatitis B and Hepatitis C Seropositivity Rates in Pregnants who Live in Kırıkkale Region. Bozok Med J 5: 1-4
26. Aynoğlu A, Aynoğlu Ö, Akar T, Aydın M, Altmuk ES (2015) HBsAg, Anti-HBs and Anti-HCV Seropositivity Rates among Pregnant Women Attending a University Hospital in Zonguldak. Viral Hepat J 21: 31-34

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