



## Seroprevalance of hepatitis B and C infections in Turkey

Tozun N, Ozdogan O, Cakaloglu Y, Idilman R, Karasu Z, Akarca U, Kaymakoglu S, Ergonul O. Seroprevalance of hepatitis B and C virus infections and risk factors in Turkey: a fieldwork TURHEP study. *Clin Microbiol Infect.* 2015; Nov 21(11):1020-6.

Viral hepatitis is the leading cause of cirrhosis and liver cancer. Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections represent a serious public health concern. An estimated 240 million people show chronic HBV infection and between 130 and 170 million people show chronic HCV infection worldwide (1-3). HBV- and HCV-related liver diseases account for 686,000 and 700,000 deaths each year, respectively (1,2). The knowledge and awareness regarding chronic viral hepatitis are insufficient at the public level. Furthermore, the lack of surveillance strategies underrepresents the exact seroprevalance of HBV and HCV infections. Surveillance strategies can establish reliable epidemiological data to improve the prevention and control of HBV and HCV infections.

According to World Health Organization, Turkey has an intermediate endemicity for HBV and low endemicity for HCV. Epidemiological studies examining the seroprevalance of HBsAg report a prevalence of 2%–7% in Turkey (4-8). However, most of these data were based on retrospective analysis of cohorts comprising blood donors or risk groups. The data on prevalence of hepatitis C in Turkey is very limited, comprising a few studies from the southeastern and southwestern regions (9,10). A study by Tozun et al. (11) was the largest population-based study in Turkey, including 5460 participants from the rural and urban areas of 23 cities. The mean age of the study population was 41 years, and 51% were women. Overall HBsAg positivity was 4% with a higher prevalence in the eastern regions. Of the HBsAg-positive participants, 59% were male and 95% were HBe antigen negative and 37.6% had HBV DNA >2,000 IU/mL, almost all HBV genotypes were type D. Prevalance of HDV and HCV coinfection was 2.8% and 0.9%, respectively. The risk factors for HBV infection were male sex, lower education level, history of contact with an HBV-

infected patient, residing in the southeastern region of Turkey, being married, history of dental intervention, and history of use of non-disposable syringes. Anti-HCV was positive in 1% of all participants, with 92.1% showing genotype 1b. Age older than 50 years was the only risk factor for anti-HCV positivity.

The study is a well-designed field study with a large number of participants providing a clear data on the current state of HBV and HCV in Turkey. The study has numerous practical implications for screening and prevention of HBV. First, the study established the seroprevalance of HBV infection, confirming that Turkey has an intermediate endemicity for HBV. Second, intrafamilial transmission, low educational level, and residing in the southeastern region of Turkey were risk factors for hepatitis B. Considering that 95% of the HBsAg-positive participants were anti-HBV positive, horizontal transmission can be assumed to have a greater role in sustaining HBV infection. Despite the success of vaccination and antiviral therapy, chronic HBV infection still remains a serious problem because many patients are unaware of their disease. Furthermore, the reported frequency of previous HBV vaccination was very low (10.7%). These results should endorse the primary healthcare providers to screen the patients at risk and ensure the vaccination of all family members of HBV-infected patients and to increase the knowledge and awareness of the public regarding hepatitis B. In Turkey, a national HBV vaccination program for newborns was launched in 1998, whereas an additional catch up vaccination is offered at primary school. This study included the patients born before the vaccination program. However, HBsAg seroprevalance substantially decreased after the launch of the national vaccination program, as reported in a study showing a decline in the number of infected individuals from 12% in 2000 to 5% in 2012 (4). Third, 20% of the HBsAg-positive individuals had HBV DNA >20,000 IU/mL and 18% had HBV DNA 2,000–20,000 IU/mL, suggesting that these individuals had chronic hepatitis B and might have a need for treatment. Large number of infected persons who are unscreened may

remain undiagnosed and may not have adequate referral to medical care. Finally, anti-HDV was positive in 2.8% of HBV-infected patients. Hepatitis D is the most severe form of viral hepatitis and a serious health threat, particularly in the south-eastern regions of Turkey because it accounts for almost half the total number of cases of liver cirrhosis and hepatocellular carcinoma (12). Because HDV can only cause infection in the presence of HBV, the widespread introduction of HBV vaccine will ultimately result in a decrease in the prevalence of HDV.

The study by Tozun et al found that hepatitis C prevalence was 1% in Turkey and approximately half of the HCV-infected participants were >50 years old. HCV genotype 1b was the most prevalent subtype in Turkey. A study comprising 500 patients that investigated the phylogenetic analysis of HCV-infected patients showed that HCV genotype 1b remained the most prevalent type throughout the previous decade (13). In Turkey, there is no national screening program for HCV. In routine clinical practice, screening of pregnant women and couples before marriage and screening prior to surgical procedures are performed. The remarkable advances in HCV also represent a challenge to many healthcare systems because of the cost of new treatments. The reimbursement of direct-acting antiviral drugs (DAAs) for HCV, including sofosbuvir, ledipasvir/sofosbuvir, and a "3D regimen" of paritaprevir (ritonavir boosted), ombitasvir, and dasabuvir was approved in June 2016 by the Turkish Ministry of Health. Treatment is prioritized for patients with an Ishak fibrosis score of  $\geq$ F3, cirrhosis, and decompensated cirrhosis. With the availability of DAAs, HCV has become curable. Solid estimates of disease burden will enhance the healthcare strategies to decrease the incidence and prevalence of HCV infection.

Advances in the prevention and treatment of HBV and HCV infections are expected to significantly change the global burden of disease in future. Universal HBV vaccination programs improved screening of blood products, and increased availability of safe injection materials reduced the incidence and prevalence of HBV and HCV infections. With the availability of potent antiviral agents, virological suppression of HBV has been achieved. Development of DAAs led to a cure that has been shown to alleviate chronic liver disease and hepatocellular carcinoma and reduce liver-related mortality. Health authorities and physicians should combine their efforts to take national actions against HBV and HCV infections through screening, prevention, and accurate treatment administration.

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