

The Prevalence of Hepatitis B and C Among Prisoners in Kahramanmaras, Turkey

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Abstract

Background: Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections are among the most important health issues in Turkey. Human immunodeficiency virus (HIV) infections are less frequently observed in the country. The individuals who had blood transfusions, patients undergoing hemodialysis, and intravenous drug addicted individuals, people who had tattoos/piercings, communal living environments, contamination of a family member, and prisoners are the main risk groups.

Objectives: The current study aimed to discuss the prevalence and the genotypes of hepatitis and HIV infections among a specific group, namely individuals incarcerated in prisons.

Patients and Methods: Two-hundred and sixty-six prisoners sentenced for crimes such as robbery, sexual assault, assault substance abuse or selling drugs in the Kahramanmaras closed prison were recruited for the study. Demographic data and the presence of hepatitis B, hepatitis C and HIV were investigated in the study subjects.

Results: Out of the 266 cases included in the study, 89.5% were male, 10.5% were female and the mean age was 31.21 ± 8.99 years. Risk factors were detected in 27.4% of the subjects. Out of the 73 subjects, among whom the risk factors were detected, 20.3% had intravenous substance use, 3.8% had a history of operation/transfusion, 1.9% had a history of indentation and 1.5% had unprotected sexual contact. The rate of hepatitis B surface antigen (HBsAg) positivity was 2.6%, the ratio of anti-HBs positive subjects was 35.0% and immunity was achieved with vaccination in 43% of the subjects. Anti-HCV was positive in 17.7% of the prisoners and the genotype 3 and genotype 1 were 68.1% (n = 32) and 2.1% (n = 1), respectively.

Conclusions: Continued substance abuse among most of the drug addicted individuals in prisons, common use of injection materials, tattoos and other circumstances that cause blood contact increase the risk of blood-borne infections.

Keywords: Hepatitis B, Hepatitis C, HIV, Prisoners, Turkey

1. Background

Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections are still among the important health issues, in Turkey. However, human immunodeficiency virus (HIV) infections are less frequently observed, in the country. Although the modes of transmission are through parenteral, horizontal and vertical routes, while its incidence may vary between different countries and regions. The individuals who had blood transfusions, patients undergoing hemodialysis, intravenous drug addicted individuals, people who had tattoos/piercings, communal living environments, contamination of a family member and prisoners are the main risk groups (1).

It is known that 400 million people worldwide are infected with HBV and approximately 175 million people

are infected with HCV. Turkey is accepted as intermediately endemic region for both agents. These infections become chronic and cause hepatic failure, cirrhosis and hepatocellular cancer (1, 2).

According to a 2014 report of the world health organization (WHO), 35 million people in the world are infected with HIV and approximately 39 million people have died because of this disease since it was defined in 1981. According to the data stated in June 2014 by Turkish ministry of health, there were 8,238 HIV/AIDS patients in Turkey. It is thought that this number does not reflect the reality since there is insufficient admissions to health institutions of sexually transmitted infections and inaccurate recording (3).

Unfavorable health conditions and community living environments carry risks of spreading hepatitis infections. Determination of hepatitis infections and implementing preventive measures in communal living environments, such as prisons, is of high importance. Furthermore, the high rates of drug addiction among prison inmates make this issue more challenging. Although there are several worldwide studies dealing with this risky group, few studies are conducted in Turkey.

2. Objectives

The current study aimed to discuss the prevalence and genotypes of hepatitis, and prevalence of HIV among the prison inmates regarding the literature.

3. Patients and Methods

The study was approved in the ethics committee of Kahramanmaraş Sutcu Imam university medical faculty, Kahramanmaraş, Turkey (date: 02.06.2014, number: 07) and conducted with the permission of the public prosecutor of Kahramanmaraş (date: 29.08.2014, No. 2861-2 muh). Two-hundred and sixty-six cases sentenced in Kahramanmaraş prison due to certain crimes such as robbery, sexual assault, assault, substance abuse or selling were recruited for the study. These cases were evaluated in polyclinics of Necip Fazıl city hospital from May 2014 to May 2015. The age, gender and risk factors were considered, and HBsAg, Anti-HBs, HBeAg, anti-HBe, anti-HBcIgG, anti-HCV and anti-HIV levels were examined. HBV DNA levels were studied in HBsAg positive individuals. HCV RNA levels and HCV genotypes were investigated in anti-HCV positive individuals. The study was carried out retrospectively. Medical record files issued by infectious diseases department of Necip Fazıl hospital, a clinic providing healthcare service for prisoners, for the individuals were investigated.

Data were analyzed using SPSS ver.15.0. The relationship between diagnosis and individuals' characteristics was evaluated using Pearson's chi-square test with Yates' continuity correction and Fisher's exact test. A $P < 0.005$ was considered significant. Data were expressed as the mean \pm SD and the distribution of frequencies as percentage.

4. Results

Out of 266 subjects participated in the study, 89.5% ($n = 238$) were male and 10.5% ($n = 28$) were female with a mean age of 31.21 ± 8.99 years (min = 18, max = 63). Regarding the examined risk factors, 72.6% ($n = 193$) of the subjects were free from risk factors; while, 27.4% ($n = 73$) showed risk factors. Out of 73 subjects with the risk factors, 20.3% had intravenous substance use, 3.8% had a history of operation/transfusion and 1.9% had a history of indentation; while, 1.5% of subjects had previous unprotected sexual contact.

When the subjects were examined according to the presence of hepatitis B, HBsAg positivity was detected in 2.6% ($n = 7$) and HBV DNA level in only two subjects was above 2,000

IU/mL. No subject had received chronic hepatitis B treatment. The ratio of anti-HBs positive subjects was 35.0% ($n = 93$) and 43% ($n = 40$) of them had been immunized by vaccination (57% were anti-HBs and anti-HBc IgG positive), isolated anti-HBc IgG positivity was detected in only one subject.

Anti-HCV was positive in 17.7% ($n = 47$) of the Kahramanmaraş prison inmates and genotypes 3 and 1 were 68.1% ($n = 32$) and 2.1% ($n = 1$), respectively. The ratio of anti-HCV positive and HCV RNA negative individuals who had not received treatment was 29.8% ($n = 14$). It is not clear whether these 14 subjects demonstrated the presence of infection or it was false anti-HCV positivity. While there was a history of intravenous substance use in eight subjects and a history of dental treatment in one, however, no risks were found in five subjects. The ratio of anti-HCV positive and HCV RNA negative individuals who had received treatment constituted 3.8% ($n = 10$) of the study population. HCV-RNA values were 2070-170999068 IU/mL. The coupling of HBV and HCV infections was not detected. Anti-HIV positivity was not encountered in any individuals included in the study. The data regarding subjects included in the study are presented in Table 1.

Table 1. Laboratory Results of the Study Subjects^a

	Positive	Negative
HBsAg	7 (2.6)	259 (97.4)
Anti-HBs	93 (35)	173 (65)
Anti-HCV	49 (17.7)	217 (82.3)
HCV RNA ($n = 47$)	23 (49.8.9)	24 (51.1)

^aValues are expressed as No. (%).

5. Discussion

When the prisons were examined in general; the prison inmates had risky behavioral patterns, violent tendencies, deviant sexual behavior and substance abuse; and it was found that the cleaning and hygiene procedures were not properly followed in the environments where such crowded groups live together with continued risky behaviors in prisons (4). Continued substance abuse in prisons by most of the drug addicts, common use of injection materials, tattoos and other circumstances that result in blood contact increase the risk of infections (2).

It is reported that 60% - 80% of the individuals in prisons previously had an HBV infection and only 5% - 10% of them carry the disease; however, the relation of HBV infections to substance use could not be fully demonstrated (5-7). It is stated that HCV transmission is observed among intravenous drug addicts, especially in industrially developed countries (8-11). HCV seroprevalence is 30% among the prison inmates and in a meta-analysis including 30 studies, a relation was found between HCV infection and intravenous substance use (8, 12, 13).

The subjects included in the current study were primarily young (mean age 31 years) and male. The higher ratio

of males when compared to females was due to the fact that the number of female prisoners was less than the male ones. When the risk factors were examined, there was a history of intravenous substance use in 20.3% of the prisoners included in the study. In the previously conducted studies, it was reported that HCV transmission was a result of intravenous substance use (8, 12, 13).

In the studies on prisoners with a history of intravenous substance use, the rate of HBsAg positivity was 2.9% to 4.5% (14-17). The ratio of HBsAg positivity in the current study was 2.6%, which was lower compared to the related literature. It is stated that 35% of the prisoners were immunized against hepatitis B infection. The rate of the subjects immunized via vaccination was 15%. A study from Iran reported that 12.37% of the individuals in the specific groups were immunized (isolated HBsAb positive) by vaccination (15). Therefore, it is demonstrated that the rate of immunization among the individuals who demonstrate risky behaviors is low and vaccination is necessary to protect public health.

According to a report of WHO in 2013, the prevalence of HCV increased to 2.8%, worldwide. The reported stated that this ratio was 3.6% (3.2% - 4.1%) in north Africa/middle east region, in which Turkey is located (18). In a study, dealing with general European population, by Esteban et al. the prevalence of HCV was reported 0.5% in western Europe, 2.5% in Southern Europe and 6% in eastern Europe (19). In a meta-analysis conducted by Vescio et al. the prevalence of HCV was 30% - 40% (2% - 58%) among the prisoners (8). According to the literature, the rate of HCV infection among prisoners was higher compared to the general population. In Turkey, the rate of anti-HCV positivity among the general population varies from 0.1% to 0.9% (20, 21). It is thought that the data do not reflect the worldwide populations as the studies are conducted in relatively limited regions. No study demonstrated the presence of HCV among the prisoners in Turkey. Thus, authors believe that the current study could represent the statistics of Turkey. Worldwide examination of the patients with HCV based on genotype revealed that the most common subtypes were genotypes 1 and 3; however, it was found that genotype 3 was particularly higher among prisoners (22-27).

Anti-HCV was positive in 17.7% of Kahramanmaraş prison inmates and positivity rates of genotypes 3 and 1 were 68.1% and 2.1%, respectively. The ratio of anti-HCV positive, HCV RNA negative subjects, who had never received treatment, was 29.8%. The study by Roman et al. which included patients and prisoners who had been hospitalized for treatment (28.4%), found that 53.4% of HCV positive cases among the general population were genotype 1 and in prisoners, 46.5% of the HCV positive cases were genotype 3 (28). When the studies on prisoners were examined, an HCV genotype 3 coupling was 13.4% in Germany (29); 22% - 63% in France (30, 31) and 29.3% in the Netherlands (32). Many studies have revealed that the most important risk factor among the individuals with HCV genotype 3 was intravenous substance use (33-35).

In the studies previously carried out in various states of USA, HIV positivity was 0.7% - 7.0% among the prisoners and this ratio was 0.4% in Australia (2, 36). In the current study, HIV positivity was not detected. In general, the disease has an asymptomatic duration of approximately 8 - 10 years if the virus is transmitted through unprotected sexual contact or substance use. A failed registry system that does not work properly and the patients do not apply to a health center because of fear of being stigmatized make the diagnosis, treatment and follow up of the disease more difficult.

5.1. Conclusions

In conclusion, the current study provides an approximate HCV prevalence and genotypic distribution among the prisoners in Turkey. Similar to European countries, intravenous drug use is a significant risk factor in HCV transmission. Thus, it is necessary to decrease the rate of intravenous substance use. It is important to prevent intravenous drug user (IVDU) or develop preventive measures for HCV transmission among the individuals in prisons. It is essential to consider this situation both to develop preventive public health policies for human health and effective use of economic resources and also plan the diagnosis and early treatment. It is necessary to conduct large scaled studies to determine HCV prevalence and substance abuse in Turkey.

Footnote

Authors' Contribution: Study concept and design: Derya Keten, Mehmet Emin Ova, Hamit Sirri Keten, Alper Keten, and Evrim Gulderen; analysis and interpretation of data: Seray Tumer, Ahmet Caliskan, and Suleyman Kulotu; drafting of the manuscript: Derya Keten, Mehmet Emin Ova, Hamit Sirri Keten, and Alper Keten; critical revision of the manuscript for important intellectual content: Derya Keten, Mehmet Emin Ova, Hamit Sirri Keten, and Alper Keten; statistical analysis: Hamit Sirri Keten.

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