HBsAg, Anti-HCV and Anti-HIV Seroprevalance Among Drug Users: a Retrospective Assessment

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ABSTRACT

Introduction: Drug abuse and co-occurring infections are associated with significant morbidity and mortality. In regions with high rates of drug usage, infections like hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) are highly prevalent. Epidemiological studies on HBV, HCV and HIV infections among users of illicit drugs are scarce in Turkey. The primary aim of this cross-sectional and retrospective study was to determine the hepatitis B surface antigen (HBsAg), anti-HCV antibody (anti-HCV) and anti-HIV antibody (anti-HIV) seroprevalences in drug users who applied to a psychiatric outpatient clinic of drug addiction of a university hospital. Secondly, the assessment of HBsAg, anti-HCV and anti-HIV parameters among intravenous drug users was aimed.

Methods: Serum samples of all patients on probation who applied to a psychiatric outpatient clinic of drug addiction of a university hospital between 2013–2017 and sent to the department of medical microbiology for routine serologic testing were included in the study. The serologic results were obtained retrospectively from laboratory records. For the

statistical analysis of the data IBM SPSS 20.0 program was used.

Results: Among the studied individuals, the ELISA results demonstrated the existence of HBsAg, anti-HCV and anti-HIV in 94 out of 4357 patients (2.2%), 27 out of 4451 patients (0.6%) and 10 (0.2%) out of 4464 patients, respectively. According to the records, 17 of the patients reported intravenous drug usage. Among this patient group, three patients were found to be anti-HCV positive and one patient was found to be anti-HIV positive.

Conclusion: In our study, the prevalence of HCV and HIV was increased in patients with intravenous drug usage, whereas in non-intravenous drug users the prevalence is similar to the normal population. In order to plan prevention and harm reduction services for this high-risk population, more national data is needed on HBV, HCV and HIV rates among this group.

Keywords: Drug abuse, intravenous, hepatitis B, hepatitis C, HIV

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INTRODUCTION

Drug usage and addiction is one of the major health problems with serious negative outcomes. According to the data from World Health Organization (WHO); one of each 20 adults or 250 million people between ages 15–64 worldwide have at least one drug usage history and approximately 12 million people use drugs intravenously (1). Drug usage in Turkey appears to be a serious problem which should be addressed with its medical outcomes. Considering the results of “Research on Attitude and Behaviour Towards Tobacco, Alcohol and Drug Usage in the General Population of Turkey” in 2011 which is conducted by TUBİM for the first time in national population, the prevalence of at least one drug usage once including marijuana between ages 15–65 is 2.7% while between ages 15–16 it is 1.5% (2). According to the 2018 National Drug Report of Turkey, the drugs which are detected nationwide can be aligned in decreasing order according to the amount and number of people

arrested with the drug as marijuana, synthetic cannabinoids, heroin, metamphetamine and ecstasy (3).

Drug usage is considered an important risk factor for the contamination of some infectious diseases and it increases the global burden of these infections. Especially the prevalence of blood-borne viral infectious diseases is higher among intravenous drug users compared to the general population (4,5). WHO estimates a prevalence of 14% for Human Immunodeficiency Virus (HIV), 52% for Hepatitis C Virus (HCV) and 9% for Hepatitis B Virus (HBV) infections among intravenous drug users in 2014 (1). In addition to the high prevalence among intravenous drug users, there are some studies showing increased prevalence of HCV and HBV infections among non-intravenous drug users (6,7,8,9).

In the countries where illegal drug usage is common, it's obligatory to take legal precautions because of the increasing rate of both individual and social problems of drug addicts. In this context, drug addicts who use, sell, produce drugs; act criminal while under the effect of drugs or while supplying drugs are scheduled in probation and connectedly, obligatory treatment. The main idea of this application is that community based treatment sanctions would be more effective than imprisonment for drug addiction and the ones who are punished would adapt easier to the society with this kind of programmes of protection (10).

Probation Application which is applied as an important step about the concept of punishment and security precautions, was initiated by the government of Turkey on July 20 2005 issued by the number 25881 of the National Newspaper through the research on criminology and progression in scientific methodology (11). According to the "Treatment of Cases on Probation" notice which was released on 22 December 2009 by the Ministry of Health, probation cases are directed to the state hospitals which employ psychiatrists and psychologists. A urine test once in every two weeks for three times, a clinical assessment for addiction and at least three months of follow up by a psychiatrist and an educational programme for probation with a duration of six weeks by a psychologist are implemented for the cases on probation. By the end of the follow up, a report is drawn up for each case and delivered to the probation offices. Ege University School of Medicine Psychiatry Department Outpatient Clinic of Addiction is tasked with being a center for probation follow-up and continues the surveillance of the cases.

In the initial psychiatric interview of the cases during the probation process, infectious comorbidities related to drug abuse are screened via routine laboratory tests of serologic markers. With this routine application, both the assessment of the prevalence of the infectious comorbidities among drug users and the recommendation and implementation of preventive care as a public health service is aimed.

Although studies on prevention of drug addiction are being conducted, epidemiological studies about infectious diseases among drug users are scarce in Turkey. In this retrospective and cross-sectional study, prevalence of hepatitis B surface antigen (HBsAg), hepatitis C antibody (Anti-HCV) and human immunodeficiency virus antibody (Anti-HIV) among cases on probation who applied to Ege University School of Medicine Psychiatry Department Outpatient Clinic for Addiction with a history of drug usage and routine screening for infectious markers, was targeted.

METHOD

Study Sample

In this study, the records of psychiatric interview of 4483 cases on probation who applied to Ege University School of Medicine Psychiatry Department Outpatient Clinic for Addiction between January 2013 and

December 2017 were investigated, drug usage data and drug usage methods of these cases were recorded.

Material and Application

Clinical data were assessed in accordance with the test results of viral parameters of probation cases which were sent to the serology laboratory retrospectively. From the serum samples, HBsAg was examined in 4357 cases aging between 14-71 (mean±SD 30±9), anti-HCV was examined in 4451 cases aging between 17-74 (mean±SD 30.01±9) and anti-HIV was examined in 4464 cases aging between 17-74 (mean±SD 29.9±9). Peripheral serum samples were analyzed by Architect i20000SR (Abbott, USA) using Architect HBsAg Qualitative Reactive Kit for HBsAg, Architect Ag/Ab Combo Reactive Kit for anti-HIV and Architect Anti-HCV Reactive Kit for anti-HCV. Positive samples for anti-HIV were verified by Anti-HIV Line Immunoassay Test (INNO-LIA™ HIV I/II Score Fujirebio).

Statistical Analysis

IBM SPSS Version 20.0 was used during the data analysis. Statistical significance was set at $p < 0.001$.

Ethical Issues

For the execution of this research, an approval from the local Ethics Committee of Ege University School of Medicine was obtained.

RESULTS

Among all the cases included in the study, 94 (2.2%) out of 4357 cases were HBsAg positive, 27 (0.6%) out of 4451 cases were anti-HCV positive and 10 (0.2%) out of 4464 cases were anti-HIV positive (Table 1). 10 cases which were positive for anti-HIV enzyme immunoassay were verified as HIV-1 by HIV line immunoassay. 17 cases were detected as positive for the history of intravenous drug usage from the medical records of the psychiatric interviews. The ages of these cases were between 21-40 (mean±SD 29.84±5.7) and all of these cases were male. Three out of 17 cases were detected positive for anti-HCV (17.6%) and one was detected positive for anti-HIV (5.8%). No positivity was detected for HBsAg.

The cases were categorized in six groups according to age (17-25, 26-30, 31-35, 36-40, 41-45, 46≤). Seropositivity distribution by age was summarized in Table 2.

HBsAg positivity significantly increased by age ($p < 0.001$). Due to the limited numbers of anti-HCV and anti-HIV positive cases, age-related statistical analysis could not be performed. Similarly, due to the limited numbers of the cases with a history of intravenous drug usage, statistical analysis for the comparison of intravenous drug users and non-intravenous drug users for anti-HCV and anti-HIV positivities could not be performed.

Table 1. HBsAg, Anti HIV-1/2, Anti-HCV Results in the studied population

	HBsAg (%)	Anti-HCV (%)	Anti-HIV (%)
Positive	4263 (97.8)	4423 (99.4)	4454 (99.8)
Negative	94 (2.2)	27 (0.6)	10 (0.2)
Total	4357	4451	4464

HBsAg, Hepatitis B surface antigen; Anti-HCV, Hepatitis C antibody; Anti-HIV, HIV antibody.

Table 2. Distribution of Infectious markers by age

Age groups	HBsAg (%)			Anti-HCV (%)			Anti-HIV (%)		
	Negative	Positive	Total	Negative	Positive	Total	Negative	Positive	Total
17–25	1650 (98.5)	25 (1.5)	1675	1704 (99.5)	8 (0.5)	1712	1720 (99.9)	2 (0.1)	1722
26–30	1038 (98.3)	18 (1.7)	1056	1070 (99.5)	5 (0.5)	1075	1071 (99.6)	4 (0.4)	1075
31–35	671 (97.5)	17 (2.5)	688	704 (99.7)	2 (0.3)	706	709	-	709
36–41	416 (97.9)	9 (2.1)	425	432 (99.3)	3 (0.7)	435	433 (99.5)	2 (0.5)	435
41–45	208 (95.4)	10 (4.6)	218	215 (98.2)	4 (1.8)	219	219 (99.5)	1 (0.5)	220
46≤	280 (94.9)	15 (5.1)	295	300 (98.7)	4 (1.3)	304	302 (99.7)	1 (0.3)	303
Toplam	4263 (97.8)	94 (2.2)	4357	4425 (99.4)	26 (0.6)	4451	4454	10 (0.2)	4464

HBsAg, Hepatitis B surface antigen; Anti-HCV, Hepatitis C antibody; Anti-HIV, HIV antibody.

DISCUSSION

Drug usage and the concomitant infections are important for morbidity and mortality. It is estimated that in European Union, over 93 millions of adults or one quarter of the population aging between 15-64 had tried illegal drugs at one point in their lifetime. Drug usage is reported higher for men (56.8 million) than women (36.8 million) (12). In regions where drug addiction prevalence is high, viral infections such as HIV and HCV are more prevalent. Most of the infections detected among drug users are blood-borne viral infections transmitted during intravenous drug usage by unsafe injections. It is recorded that most of the new HCV infections worldwide are due to drug use, mainly by intravenous route. Each year 60 percent of new HCV infections are detected among cases who use drugs intravenously (13, 14). Many studies on intravenous drug users, HBV and HIV prevalences are recorded higher compared to the general population (8).

Although there are programmes for the prevention of drug addiction in Turkey, studies investigating infectious diseases transmitted with drug usage are limited. In 2012, 1821 out of 2007 cases of intravenous drug users who received inpatient treatment in Turkey were assessed for markers of viral hepatitis. Nine hundred twelve (50.1%) of them were anti-HCV positive and 156 (8.57%) were HBsAg positive. In addition, according to the data of Turkish Public Health Organization, 170 anti-HIV positive cases out of 6215 which were reported between 1985-2012 were intravenous drug users. Mode of transmission in six of 1068 new HIV cases detected in 2012 was reported as intravenous drug usage (2).

In a study conducted in Turkey in 1993, HBsAg and anti-HCV prevalences among drug users were found to be 7.3% and 54.8%, respectively (15). In another study from Van, Turkey with a small sized sample of non-intravenous drug users between 2010-2011; one (1.8%) out of 55 cases was found to be positive for HBsAg and one (1.9%) out of 53 cases was found to be anti-HCV positive while there were no positive cases for anti-HIV (16). In another study conducted in Elazığ, Turkey, 235 cases of drug users were assessed and among these cases 2.6% were positive for HBsAg, 9.4% were positive for anti-HCV and there were no anti-HIV positive cases (17). In our study, most of the cases were non-intravenous drug users and 94 (2.2%) out of 4357 were HBsAg, 27 (0.6%) cases out of 4451 were anti-HCV and 10 (0.2%) out of 4464 were anti-HIV positive.

In a review which analyzed 129 studies about seroprevalences in general population in Turkey between 1999-2009; HBsAg positivity in general population was reported as 4.57% (18). Another population based epidemiologic study in 2015 HBsAg positivity rate was 4%. Other studies reported that, in general population, HBsAg positivity had decreased from 4-5% to 2% in Turkey recently (19,20). Results of our study have indicated that HBsAg seroprevalence among drug users is not different than the general population. This finding may be due to increase in HBV vaccination rates and low number of intravenous drug users in the study group. Still, the significant increase by age may be the indicator for the unvaccinated population being at risk.

HCV infection is common in Europe among drug-injecting population, therefore this population is presented as a target group for the HCV testing and treatment in order to prevent the progression of the liver disease (12). There are also studies which demonstrate higher prevalences of HCV infection among non-intravenous drug users compared to the general population (21, 22). The equipment being used during the preparation of the drug as well as the HCV presence in the nasal secretions are considered to be the mode of transmission for HCV (23). In three other Turkish studies, anti-HCV positivity rates were found to be 1.9% (among non-intravenous drug users), 9.4% (1.8% among cannabis users, 15.7% among opiate users) and 54.8% (among intravenous drug users) respectively. On the other hand, in our study, seroprevalence of anti-HCV was found as 0.6% which is not different from the seroprevalence rates in the general population that ranges between 0.4-1.5% (20, 24, 25, 26) but when the limited number of intravenous drug users were considered (n=17), the rate of anti-HCV increases to 17.6%.

In Turkey, cases of HIV/AIDS infection have been reported since 1985. In a research which was conducted in five cities in 2007 within high risk groups (Research on the Services Related to Sexually Transmitted Diseases and HIV in Turkey), the HIV prevalences among illegal sex workers, men who have sex with men and intravenous drug users were found to be 0.8%, 3.5% and 1.2% respectively (27). According to the data of the Ministry of Health, Public Health General Directorate, Infectious Diseases Department; there were a total number of 17884 cases (16201 cases positive for HIV and 1651 cases of AIDS) reported since the detection of the first case in 1985 until 31 December 2017 (28). There are many studies showing the increasing risk of HIV among intravenous drug users. Intravenous drug usage is being held responsible for 10% of the HIV cases and this rate goes up to 30% in Africa (29). In countries

like Greece, Bulgaria and Iran which are neighbours of Turkey, anti-HIV positivity among intravenous drug users are found to be 20.4%, 8.9% and 18.4% respectively (30,31,32). In our study, ten anti-HIV positive samples were detected in the total number of 4464 cases being mostly non-intravenous drug users. Anti-HIV positivity was detected in one of the 17 cases using drugs by intravenous route. Due to the highly risky behaviours such as unprotected sexual intercourse and multiple sexual partners, a high prevalence of HIV is being reported among non-intravenous drug users (33,34).

Intravenous drug users are under risk of infectious diseases, especially like HBV, HCV and HIV. Some of the studies indicate that among non-intravenous drug users, the prevalence for these infections also increases. Besides, drug users are considered to be sources for these infections. Compared to similar studies, the presented study has quite a larger sample size. The prevalences of these infections were not significantly different from the general population. Still a careful follow-up of this group and attaining national data by investigating the rates in different regions are essential for developing preventive programmes. The effective treatment of HCV infection by new generation antiviral agents in this group might be beneficial for reducing the number of cases which could transmit the infection. European clinical guidelines recommend the assessment of all cases with chronic liver disease due to HCV infection for treatment. Likewise treatment of the cases infected with HIV with highly active retroviral agents, risk counselling about infectious diseases, supplying HBV vaccination for those who are seronegative for hepatitis B are main approaches for the reduction of infections in this population.

In our study HBV, HCV and HIV prevalences among drug users assessed as part of probation application were similar to the general population. This finding is important to underline the significance of followup and close monitoring of serologic comorbidities for early guiding towards treatment and taking protective precautions in this group especially when the lifestyles and risky behaviour under the effect of drugs are considered. The increased prevalences of HCV and HIV among intravenous drug users are open to discussion about causality since there is only a correlation, considering the study design. The main limitation of this research is the possible data loss about the drug usage methods and risky behaviours of the cases which weren't noted in the case files. Bearing in mind that there is no possible causality methodologically, assuming the possibly increased intravenous drug usage prevalence, the rise of seroprevalences of infections might be higher.

Ethics Committee Approval: The study was approved by the Medical Research Ethics Committee of Ege University.

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