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Comparison of Risk Factors Frequencies of Hepatitis C in Two Provinces

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Abstract

Risk factors for transmission routes of hepatitis C virus (HCV) may vary in countries like Turkey which has geographical, cultural and socioeconomical differences among regions. In this study data from two provinces of Turkey were analysed to evaluate and compare the risk factors frequencies of HCV. From 2007 through 2014, a total of anti-HCV positive 90 patients from Bursa Yuksek Ihtisas Research and Training Hospital located in the west region of Turkey and 100 patients from Kilis State Hospital located in the south east part were included in the study to compare risk factors of HCV infection. Patients were questioned about history of dental treatment, hospitalization, blood transfusion, surgical operation and intravenous drug use which are major risk factors for transmission of HCV. Overall history of previous dental treatment was the most prevalent risk factor in both provinces followed by hospitalization, blood transfusion and operation. The use of intravenous drugs was higher in Kilis with a statistically significant difference. In every patient at least one risk factor was present. Although Kilis has a conservative community and lower socio economical level, this unexpected observation may be related to reflections of border trade of drugs on society. Thus preventive measures should be taken, considering socioeconomical differences among regions.

Keywords Chronic hepatitis C; Risk factors; Intravenous drug; Nosocomial infection

Introduction

Hepatit C virus (HCV) is a major cause of chronic liver disease worldwide. It is estimated that more than 180 million people are infected with HCV and 70% of these infections become chronic that may lead to cirrhosis and hepatocellular carcinoma [1,2]. HCV infection is the most common indication for liver transplantation in many countries. Transmission routes of HCV infection are percutaneous, intravenous administration of contaminated blood and blood products, use of intravenous (IV) drugs, hemodialysis, nosocomial infection with unsafe medical practices, transplantation of organs from HCV infected donors and maternal transmission to infant. Sexual transmission of HCV is rare. Activities with potential exposure to blood, such as tattooing, piercing, barber shop, scarification rituals, circumcision, and acupuncture also may lead to HCV transmission. These transmission routes of HCV infections are also related with infection control protocols of countries [3]. There is a significant variation in the prevalence and risk factors of HCV infection according to geographic region studied [4,5]. The aim of this study is to evaluate and compare the major risk factors of Hepatitis C in different regions of Turkey which is a heterogenous country as far as cultures and socioeconomical levels are concerned in different geographical locations.

Material and Methods

Data were retrospectively collected from patient's self-reported history about the possible routes of infection. A total of 190 anti-HCV positive patients who applied to polyclinics from 2007 through 2014 in two different provinces of Turkey were included in the study. Provinces have different cultural, socioeconomical levels and geographical localization. Kilis is located in south east region of Turkey representing conservative public with lower socioeconomical level compared to Bursa; a modern city which is located in west part of the country with higher socioeconomic level. A hundred patients from Kilis State Hospital and 90 patients from Bursa Yuksek Ihtisas Research and Training Hospital were compared in terms of the history of dental treatment, hospitalization, blood transfusion, operation and the use of intravenous drugs. Since the questions about sexual transmission which is a minor risk factor were not replied effectively by the participants these questions were excluded from the evaluation. Sampling technique is random sampling and study design is case control study. Statistical analyses were performed with SPSS 15.0 for Windows (SPSS Inc., Chicago, Illinois, USA) software using non-parametric chi-square test. Demographic characteristics of the patients were shown with frequency, percentage, average and standard deviation. The probabilities of frequency of the risk factors among the provinces were shown with frequency, percentage and odds ratio. The confidence interval was 95% ($p<0.01$).

Results

A total of 190 HCV patients were included in the study from Kilis 100 and from Bursa 90 patients were between 17 to 71 years of age with an average of 39.99 ± 11.68. 41.6% of the patients were female and 58.40% were male (Table 1).

Most frequent risk factor of HCV infection in both provinces was history of dental treatment 64.2%. Probability rate of dental treatment as a risk factor was 7.3 (Table 2).

In Kilis most frequently observed risk factor was dental treatment like in Bursa. Compared to Bursa in Kilis the rate of hospitalization and blood transfusion and use of intravenous drugs were higher in HCV patients (Table 3).

	Total		Kilis		Bursa	
			(N=100)		(N=90)	
	n	%	n	%	n	%
Sex						
Female	79	41.6	40	40	39	43.3
Male	111	58.4	60	60	51	56.7
Age						
Mean ± SD	39.99 ± 11.68		38.42 ± 12.69		35.41 ± 10.28	
Min/Max	17/71		17/71		19/61	

Table 1: Demographical characteristics of the patients.

	Present		Not present		
Risk factors	f	%	f	%	Odds
Dental treatment	167	64.2	23	3.3	7.26
Hospitalisation	35	13.5	155	22.5	0.22
Intravenous drug use	20	7.7	170	24.6	0.11
Blood transfusion	15	5.8	175	25.4	0.09
History of operation	23	8.8	167	24.2	0.14

Table 2: Distribution of risk factors according to frequencies.

	Kilis			Bursa			
Risk factors	Present f (%)	Not Present f (%)	Odds	Present f (%)	Not Present f (%)	Odds	Odds Ratio
Dental treatment	88	12	7.33	79	11	7.18	1.02
	-60.3	-3.4		-69.3	-3.3		
Hospitalisation	20	80	0.25	15	75	0.2	1.25
	-13.7	-22.6		-13.2	-222.3		
Blood transfusion	11	89	0.12	9	81	0.11	1.11
	-7.5	-25.1		-7.9	-24.1		
History of operation	7	93	0.08	8	82	0.1	0.77
	-4.8	-26.3		-7	-24.4		
Intravenous drug use	20	80	0.25	3	87	0.03	7.25
	-13.7	-22.6		-2.6	-25.9		
Total	146(100.0)	354		114	336		
		-100		-100	0		

Table 3: Comparison of risk factors among provinces according to frequencies.

The leading risk factor of HCV infection among patients was found as the history of dental treatment (88%,87.8%) in provinces of Kilis and Bursa respectively, followed by history of hospitalization (20%, 16.7%), blood transfusion (11%,10%), history of operation (7%,8.9%) and use of intravenous drugs (20%,3.3%) . At least one risk factor was present in every patient. There was no statistically significant difference among provinces in terms of dental treatment, history of hospitalization, blood transfusion and history of operation in HCV patients.($p>0.05$). But intravenous drug use in Kilis among HCV patients was higher compared to Bursa which was statistically significant ($p<0.01$) (Table 4).

Discussion

HCV is an important cause of chronic liver disease, cirrhosis and an indication for liver transplantation. It is estimated that two thirds of liver transplants are due to HCV infection. The risk factors are important to prevent the disease [6]. In our study the leading risk factor in both provinces was history of dental treatment. This can be due to inappropriate sterilization and poor hygienic conditions of the dental clinics in the country. Turkey is very different culturally and economically as far as geographical localizations are concerned. But as major risk factor dental applications suggested that sterilization and disinfection were improper and control mechanisms were not sufficient especially in both provinces of the country. But this is of paramount importance for dentists in order to protect themselves as well [7]. Hospitalization is the second leading risk factor in both Bursa and Kilis.

This risk factor is also correlated with blood transfusion and history of operation which are of course possible only in hospitals. Compared to Bursa in Kilis the rate of hospitalisation and blood transfusion were higher in HCV patients but there was no statistically significant difference among these provinces. These were the other important risk factors in both groups, consistently with the literature. For HCV infection, especially contact with blood and body secretions is quite important and infection occurs usually after blood transfusion and medical applications [8,9]. Our findings were similar to those of previous studies. In the present study blood transfusion was important risk factor in two groups. In our country, blood tests before transfusion have been performed since 1995. Therefore infection rate before that time could be higher in transfusions. In majority of the cases history of blood transfusion belongs to period before 1995. History of operation may be an important risk factor for HCV infection. In a study in Turkey 320 HCV positive patients were evaluated for the risk factors and in majority of the cases presence of 2 or more risk factors were determined [10]. In our study in every patient at least one risk factor was present. In a study in Peru unsafe injection and medical or dental applications were reported to play a major role in HCV infection [11].

	Kilis		Bursa		
Risk factors	Present	Not	Present	Not	p
	N (%)	Present	N (%)	Present	
		N (%)		N (%)	
Dental treatment	88 (88.0)	12 (12.0)	79 (87.8)	11 (12.2)	0.963
Hospitalisation	20 (20.0)	80 (80.0)	15 (16.7)	75 (83.3)	0.554
Blood transfusion	11 (11.0)	89 (89.0)	9 (10.0)	81 (90.0)	0.823
History of operation	7 (7.0)	93 (93.0)	8 (8.9)	82 (91.1)	0.63
Intravenous drug use	20 (20.0)	80 (80.0)	3 (3.3)	87 (96.7)	0

Table 4: Comparison of risk factors among provinces according to percentages.

In another study with 12 cases in Egypt, risk factors of acute hepatitis C were reported as dental applications in 5 patients, use of IV drugs in 2 patients. Whereas in 5 cases parenteral contact was not determined [12]. Although risk factors were nearly similar the order of factors may vary in different regions of the world. When the two groups were compared in the current study rate of the use of intravenous drug was higher in Kilis representing the south east region with a statistically significant difference ($p<0.05$). Bursa is located in the west part of city but Kilis has demographically specific sociocultural characteristics. The city is located in the southeastern part of Turkey. Although it seemed to have conservative and religious residents, intravenous drug abuse is surprisingly common due to possible illegal border drug trade. According to 2012 statistics drug abuse rate is nearly 1% which is quite high compared to overall population in Turkey [13]. In a study, which is related to risk factors of hepatitis, C in a border city of Southern Anatolia in Turkey it was found that risk factors might vary compared to overall country. Previous dental procedures and working abroad in neigbouring countries seem to play a role in this difference [14]. In a study related to healthcare associated risk factors for Chronic Hepatitis C infection in Korea it was observed that having multiple sex partners play a minor role in transmission [15]. In our study dental treatment, hospitalization, blood transfusion and history of operation were major risk factors in both regions but intravenous drug abuse were surprisingly a more important risk factor with a statistically significant difference in this eastern city of Turkey which prompted us to understand and explain the differences in terms of regions. Intravenous drug abuse which affected the transmission of Hepatitis C infection was common due to probable illegal border drug trade in Kilis. Hepatitis C infection has no vaccines and treatment is quite expensive. It may result in cirrhosis and hepatocellular carcinoma. Therefore protection from Hepatitis C should be the primary goal. Major risk factor was dental treatment in both cities. In every patient at least one risk factor was present But the use of intravenous drug as a risk factor of HCV infection was considerably higher in Kilis. Although the region represents conservative part of Turkey, it was surprising to make this unexpected observation which is possibly related to border trading of drugs and it's reflections on society in eastern part of Turkey. This result showed that for the prevention of new infections with HCV, precautions should be taken especially considering the differences between regions.

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