DOI: https://doi.org/10.54393/pbmj.v5i6.526

PAKISTAN BIOMEDICAL JOURNAL

https://www.pakistanbmj.com/journal/index.php/pbmj/index

Volume 5, Issue 6 (June 2022)

Original Article

Prevalence and Risk Factors of hepatitis B and C infections in general population of Tehsil Arifwala

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ARTICLE INFO

Key Words:

Prevalence, Hepatitis B virus, Hepatitis C virus, Risk Factors

How to Cite:

Ahmad , M., Kamran, M. . ., Amin, H. ., Zafar, S. ., Asghar, S. ., Siddique, U. ., Khalid, A., Sarfraz, A. . ., Khurshid, M. ., & Ullah, I. . (2022). Prevalence and Risk Factors of hepatitis B and C infections in general population of Tehsil Arifwala: Hepatitis B and C Infections in General Population. Pakistan BioMedical Journal, 5(6). https://doi.org/10.54393/pbmj.v5i6.526

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Received Date: 8th June, 2022
Acceptance Date: 22nd June, 2022
Published Date: 30th June, 2022

ABSTRACT

According to the WHO, over 350 and 250 million individuals have been estimated as chronic carriers of HBV and HCV, worldwide. About 1.34 million deaths are attributed to HBV and HCV, globally. **Objective:** To estimate the seroprevalence of HBV and HCV-related hepatitis. **Methods:** For this purpose, a population of 300 individuals was screened for HBsAg and Anti-HCV antibodies. Data were collected from tested individuals included their age, gender, occupation. Prevalence of HBV and HCV was found at 10% and 14% respectively. Co-infection of both pathogens was observed in 1.33% of individuals. Male (18%) were more infected with these viruses as compared to females (6%). The highest percentage (75%) of HBV/HCV was in adult patients of age between 31-50 years. The various risk factor associated with the spread of viral hepatitis were also considered for a better understanding of the routes of spread of these viral infections. **Results:** Out of 300 screened individuals, 21% had a history of going through any dental procedure, followed by 17% with needle stick injuries. Only 7.6% of persons had a history of any blood transfusion. Conducting such type of seroprevalence studies can help the administration and health care authorities to take necessary control measures to minimize the chances of acquiring these infections by eliminating risk factors. **Conclusion:** Further, these surveillance studies can also play a significant role in the launch of vaccination programs in areas of high prevalence.

INTRODUCTION

Hepatitis due to HBV and HCV is extremely prevalent around the globe and a substantial burden is exerted by these problematic pathogens on the health care settings. According to the WHO, over 350 and 250 million individuals worldwide are estimated the chronic carrier of HBV and HCV, respectively [1]. Significantly high global morbidity and mortality are associated with them, and approximately one million deaths per annum are attributed to HBV and HCV-related liver diseases and their sequelae of hepatocellular carcinoma [2]. By the rough estimation of WHO, approximately 4.3 million individuals are infected by HBV in the Eastern Mediterranean region, each year [3]. Pakistan was also considered one of the most prominent countries with a 7% prevalence of HBV in the late 1980s, it was classified as a country with an intermediate prevalence of HBV [4]. It has been estimated that the

DOI: https://doi.org/10.54393/pbmj.v5i6.526

economic burden due to chronic HCV infections exceeds $10 billion/ year, in the USA alone [5]. Unsafe and contaminated blood products, unhealthy dental procedures, contaminated barber tools, catheters, tattooing, unsafe sexual intercourse without precautionary measures, and different fluids of the body are the main sources of the spread of the causative agents [6]. HCV and HBV are the major etiological factors involved with hepatocellular carcinoma (HCC). Globally, of all tumor types, the HCC is the 5th most prevalent tumor, and 3rd leading cause of cancer-related deaths [6,7]. When these infections are accompanied by inflammatory reactions, destruction of the hepatocytes triggers the regeneration and scar formation (fibrosis), which then ultimately can lead to liver HCC and cirrhosis [8]. Hepatitis B virus is responsible for transient as well as chronic infections of the liver. Transient infections have a short span of a few months, while chronic infections have a long course [9]. It is estimated that transient hepatitis B infections result in serious illness, of which only 0.5% end with incurable fulminant hepatitis [10]. Chronic infections pose more serious consequences with 25% of the cases terminating permanent liver cancer [11]. The death toll due to liver cancer related to Hepatitis B virus infections reaches up to one million per year, worldwide. HBV has a very high mortality rate. Globally, a population of about 257 million has been estimated to have long-life chronic HBV infections. By an estimation, chronic hepatitis leading to liver cirrhosis, along with hepatocellular carcinoma results in 887,000 deaths/year, worldwide. Transmission of these deadly pathogens may occur through unprotected sexual contact, sharing the needles, unsterile surgical and medical equipment including syringes, scissors and cutters, and from mother to the fetus during birth. In Pakistan the percentage of infection is 61.45% due to infected needles and 10.62% because of unhealthy dental and surgical procedures. The WHO's global hepatitis report 2015 estimated that 71 million individuals were positive for HCV, which makes up 1% of the world's population, 2.3 million Individuals also had co-existence of HIV along with HCV infection. Uneven distribution of HCV infection is observed in the world, but the highest prevalence of HCV infections is seen in Eastern Mediterranean and The European. The individual prevalence rates in different cities of Punjab and provinces are as in Gujranwala 0.4-31.9%, in Lahore 23.8%, in Faisalabad 16% and 16% in Islamabad While in Gilgit Baltistan is 25.7%, in KPK province 1.5% and Sindh is 1.1-9% [12]. Similarly, screening of blood donors showed 2.60% positive results for anti-HCV patients in CMH Peshawar, Pakistan [13]. In various areas of the world, and also in Pakistan, the sero epidemiological various studies and research have been conducted in past, but there is a lapse in available epidemiological data on HBV and HCV in Tehsil Arifwala, which is still much required and questioned. The present study showed a true picture of the cumulative prevalence of infections caused by Hepatitis B and Hepatitis C virus and made the comparison possible with available data on HCV and HBV in other cities of Pakistan.

METHODS

For estimating the seroprevalence of HBV and HCV in district Arifwala, province Punjab, a descriptive cross-sectional study was conducted and 300 individuals were screened by ICT kit method followed by confirmation through ELISA. Immunochromatographic tests (ICT) were used to screen for HBV and HCV-positive samples. According to the manufacturer's directions, accurate Acon (Acon, USA) strips were utilized. ICT-positive samples were subsequently confirmed through ELISA. SPSS version 23.0 and Microsoft Excel 2016 were used for the data analysis.

RESULTS

Out of 300 screened individuals, 24% (n=72) were found positive for either HBV or HCV. Prevalence of HCV was 14% (n=42) followed by HBV with 10% (n=30). Of tested population, 71.7% (n=215) were male and 28.3% (n=85) were female. Prevalence of viral hepatitis was high in males (18%, n=54) followed by females (6%, n=18). The patient's age ranged from a minimum of 13 years to a maximum of 63 years. With the highest frequency, 79.7% (n=239) of individuals were adults of age between 25-64 years followed by 20% (n=60) of young ones who fell in the age group 15-24 years, and only 0.3% (n=1) children of age 13 years. Marital status of 66.67% (n=200) was 'married' while 33.33% (n=100) person were unmarried. By occupation, the highest proportion was of shopkeepers with 25.3% frequency, followed by the farmers, teachers, and health care personnel with frequencies of 17.7%, 16.7%, and 14.7%, respectively. It is interesting to note that the highest number of tested individuals were under matriculation in their studies with 34.7% frequency, followed by persons with the education of FA/F.Sc with 32% frequency. The person who was master's and M. Phil counted for only 5.3% and 0.7% of the total sample population (Table 1).

Demographic Characteristics		Number (N)	Percentage (%)
Gender	Female	85	28.3%
	Male	215	71.7%
Age	Children (0-14 Years)	1	0.3%
	Youth (15-24 Years)	60	20.0%
	Adults (25-64 Years)	239	79.7%
Marital Status	Married	200	66.67%
	Unmarried	100	33.33%
	Businessman	31	10.3%
	Farmer	53	17.7%

DOI: https://doi.org/10.54393/pbmj.v5i6.526

Occupation	Health Care	44	14.7%
	Shopkeeper	76	25.3%
	Student	46	15.3%
	Teacher	50	16.7%
Residence	Arifwala	300	100.00%
Education	FA	96	32.0%
	Graduate	82	27.3%
	M.Phil	2	0.7%
	Master	16	5.3%
	Under metric	104	34.7%
Transfusion	No	277	92.3%
	Yes	23	7.7%
Dental Procedures	No	237	79.0%
	Yes	63	21.0%
Needle Stick Injuries	No	249	83.0%
	Yes	51	17.0%
Sharing Shaving Razors	No	268	89.3%
	Yes	32	10.7%
Endoscopyc / Colonoscopy	No	252	84.0%
	Yes	48	16.0%
Total		300	100.0%

Table 1: Overview of collected data for estimating seroprevalence of HBV and HCV in Arifwala

Out of 42 HCV positive patients, 9.5% (n=4) were also detected positive for HBsAg, while 90.5% (n=38) were negative for HBsAg. With respect to the total population of samples, 1.3% (n=4) individuals were found infected with HBV as well as HCV (Table 2).

HBsAg	HCV Negative	HCV Positive
Negative	77.33% (n=258)	12.67% (n=38)
Positive	8.67% (n=26)	1.33% (n=4)

Table 2: Co-existence of HCV with reactive HBsAg

A direct relation was observed between occupation and the prevalence of viral hepatitis. Both HBV and HCV were prominent in health care workers with 3% (n=9) and 2.66% (n=8) prevalence, followed by shopkeepers with 2.66% (n=8) and 4.66% (n=14) prevalence of HBV and HCV respectively (Figure 1).

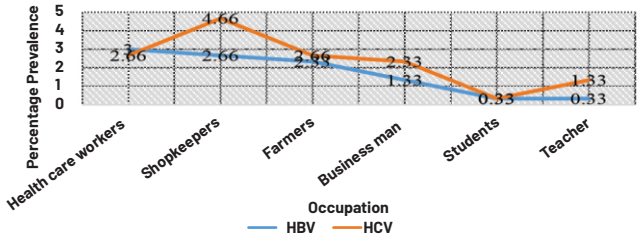

Figure 1: Association of Relative prevalence with occupation

Of the tested population, the highest frequency of HBV/HCV positive individuals was of those who have gone through any dental procedure (n=63) followed by individuals who experienced needle stick injuries (n=51). Only 23 individuals had a history of blood transfusion, of which 10 were HCV positive followed by 7 with reactive HBsAg (Table 3).

Viral infections	Blood transfusion	Dental procedures	Needle stick injuries	Endoscopy	Sharing shaving tools
HBV	23 (7)	63 (14)	51 (16)	48 (8)	32 (7)
HCV	23 (10)	63 (25)	51 (20)	48 (16)	32 (15)

Table 3: Risk factors associated with HBV& HCV

DISCUSSION

In the present study, a total of 24% test population was screened positive for either HBV or HCV. HBV was less prevalent as compared to HCV. Seroprevalence of HBV is estimated at 10% in Arifwala through this study. Similar results were observed during a study conducted in Shenzhen People's Hospital between August 2015 to September 2018, and 9.69% of individuals were detected positive for HBsAg [14]. Similarly, a Nationwide survey on the prevalence of HBV estimated the seroprevalence of HBV as high as 13.7%, in Taiwan [15]. Another study conducted in Cameroon reported an 11.2% seroprevalence of HBV [16]. While the prevalence of HCV was found at 14% in the present study. A study carried out in DHQ Mardan of province KPK reported a 9% prevalence of HCV [17]. A cross-sectional study at Paediatric Medicine Unit in Teaching Hospital Dera Ghazi Khan reported only 3.9% HCV carriers [18]. This unevenly disturbing of HCV in varying patterns around different geographical regions suggests that the prevalence of HCV is significantly co-related with the non-availability of vaccines and directly depends on the living conditions, literacy, public awareness, and also upon the healthcare facilities. While almost even distribution of HBV might be due to the easy availability of vaccines. In fact, after the availability of the HBV vaccine in the 1980s worldwide, the prevalence of HBV declined remarkably. Gender is another prominent factor that has a direct imprint on the prevalence of viral hepatitis in a specific region due to respective behavioral differences of genders, social trends and cultural follows of the community. The present study reported 75% (n=54) of the positive individuals as males while only 25% (n=18) as females. An almost similar trend was observed in a study conducted in Rawalpindi, Pakistan, with 7.15% male patients and 5.35% female patients [19]. In contrast, a study conducted in Vehari, Pakistan reported that 35.19% of males and 37.8% of females had viral hepatitis [20]. In the present study, HBV and HCV infections were more prevalent in patients of age between 31-50 years. 37.5% (n=27) of patients with viral hepatitis were falling in the age group 31-40 years and 41-50 years. Similar results were observed in a work carried out in Khyber College of Dentistry, Peshawar. This work reported the highest frequency of HBV and HCV in age groups 56-65 years and 34-45 years respectively [21]. Similarly, another study conducted in western Rajasthan, India also reported

DOI: https://doi.org/10.54393/pbmj.v5i6.526

the highest (54.3%) prevalence in patients of age 30-49 years [22]. Several miscellaneous risk factors are associated with the spread of HCV and HBV. Most prominent of these factors may include unhygienic living conditions, septic medical and surgical procedures including the dental procedures that are carried out without sterilization of tools, unprotected sexual intercourse, transfusion of body fluids especially the transfusion of blood, and unhygienic routine practices like sharing the shaving razors and injection syringes among the drug abusers. In the present study, the tested population had a significant number of individuals who had a history of experiencing one of these risk factors. 63 out of a total of 300 persons had gone through any dental procedure. Of these 63 individuals, 39.68% (n=25) were anti-HCV positive, while 22.22% (n=14) were positive for HBsAg. Another study conducted in Iraq reported that 77% and 75% of HBV and HCV-positive patients with a history of any dental procedure [23]. According to the Fact sheet on hepatitis 2017, by WHO, dental quackery is unrestrainedly practiced in that area of underdeveloped countries that have the highest burden of hepatitis [24]. In the meanwhile, of 300 individuals, only 23 had a history of blood transfusion. Of these 23 people, 43.48% (n=10) were anti-HCV positive followed by 30.43% (n=7) HBsAg positive individuals. A study carried out by the general public in Malaysia reported that 8% of HCV-positive individuals had a history of blood transfusion [25]. This low frequency of transfusion-related transmission of HCV/HBV is due to the practice of blood screening that is followed in every health care setting in routine.

CONCLUSIONS

In underdeveloped areas like Arifwala, a lack of adequate blood screening facilities and a lack of understanding about probable HBV and HCV transmission channels contribute significantly to the infection's spread among people. Proper sanitation and screening measures must be made essential in public health care facilities to avoid a much greater hazards of HCV infection. Policymakers should enact legislation and enforce its implementation prohibiting untrained dental quakes from practicing in specific sections of the province.

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