

# Comparison of Factors Associated with Hepatitis B and C in Different Age Groups of Patients Visiting A Tertiary Hospital in Lahore: A Cross-Sectional Study

Waqas Shabbir<sup>1</sup>, Kiran Namoos<sup>2</sup>, and Muhammad Aslam<sup>3</sup>

## ABSTRACT

**Objective:** To compare the risk factors and the possible mode of acquisition of Hepatitis B and C in patients of different ages

**Methodology:** A descriptive cross-sectional study was carried out at Lahore General Hospital from January 2020 to June 2020. Total 350 previously unscreened patients with ages between 16 and 55 years were included in the study after approval from the Ethical Review Committee of PGMI/LGH (095/20- 8/6/20). Patients were grouped according to age: Group 1 (16-35 years) and Group 2 (36-55 years). Screening was done by ELISA technique. Data was collected through questionnaire and was analyzed on Statistical Package for Social Sciences (SPSS) version 21.

**Results:** Incidence of Hepatitis C Virus (HCV) was found to be more common than Hepatitis B Virus (HBV) in both genders. Risk of developing viral infection in both genders increased with age. Use of I/V drugs, barber shave (via razor), dental procedures, and body piercings were the risk factors for developing infection observed in more in Group 2. Co-infection was observed more in males in Group 2.

**Conclusion:** Major contributors for Hepatitis B and C are the use of unsterilized injections tools and unscreened blood during dental procedures, blood transfusions, and visits to community barbers. Awareness regarding equipment sterilization in both the age groups may help in reducing the burden of infection in this community.

**Key words:** Age, HBV, HCV, co-infection

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## INTRODUCTION

Viral Hepatitis is caused by etiological mediators with different epidemiological and clinical characteristics, responsible for global morbidity and mortality. In 2015, an estimated 257 million people were living with chronic hepatitis B virus (HBV) infection, and 71 million people with chronic hepatitis C virus (HCV) infection globally<sup>1,2</sup>. In Pakistan, the prevalence of HBV is 3.83% and for HCV is 11.96%<sup>3</sup>.

In developing countries, the reasons for increased frequency are multifactorial like blood transfusion, use of unsterilized needles and syringes used by drug addicts and some professions including healthcare staff, barbers, household contacts<sup>4</sup>. Besides age and gender, unsafe practices in using contaminated injections, injuries due to needles, tattooing, piercing of body, use of razors, use of injecting drugs, dental care, body fluid including saliva and seminal fluid etc increase the risk of HBV and HCV<sup>5</sup>. Sharing of syringes by intravenous drug abusers is a significant risk factor for Hepatitis B and C globally<sup>6</sup>. Similarly, the people who regularly need blood/blood products, as well as patients who undergo dialysis and organ transplantation are also at risk of developing viral hepatitis<sup>7</sup>.

HBV and HCV can affect both males and females of different ages<sup>8</sup>. However, provincial level estimates regarding the epidemiology in the most populous province of Pakistan, risk factors, and prevalence in different age groups for hepatitis B and C are currently not available. Therefore, we initiated the current study with the purpose of finding out the prevalence and

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1 Assistant Professor Gastroenterology, Lahore General Hospital/PGMI/AMC, Lahore, Pakistan

2 Assistant Professor Biochemistry, Shalamar Medical and Dental College, Lahore, Pakistan

3 Senior Registrar, Gastroenterology, PKLI Lahore, Pakistan

**Correspondence:** Dr. Waqas Shabbir, Assistant Professor Gastroenterology, Lahore General Hospital/PGMI/AMC, Lahore, Pakistan

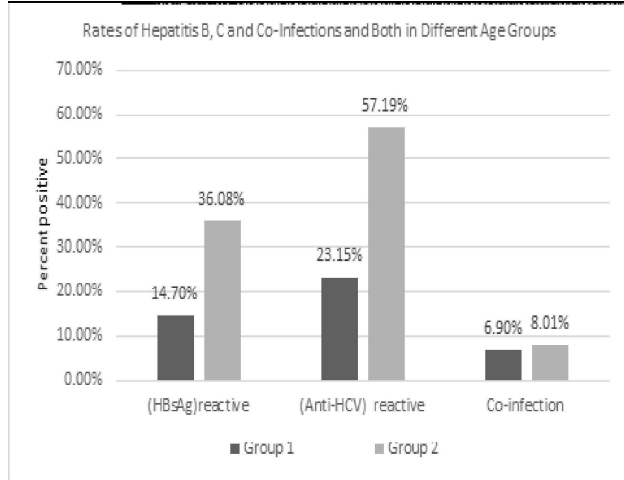
**Email:** waqasshabbir197@hotmail.com

common risk factors among the male and female populations of different age groups visiting a tertiary hospital in Lahore.

A cross sectional study was designed to compare risk factors and the possible mode of acquisition of hepatitis B and C in patients of different ages.

**METHODOLOGY**

This descriptive/cross sectional study was carried out at Lahore General Hospital Lahore, Medicine Unit 1 after approval from Ethical Review Committee of PGMI/LGH (095/20- 8/6/20) from Jan 2020 to June 2020. Sample size of 350 was calculated using WHO software and patients were selected by Non-probability sampling technique.



**Figure 1:** Rates of Hepatitis B and C and Both in Different Age Groups

**Table I: Distribution of Reactive and Non-Reactive Cases of HBV, HCV, and Co-Infection**

HBV and HCV Screened Patients n = 350	Group 1 (age 16- 35 years)		Group 2 (age 36 to 55 years)	
	Male N (%)	Female N (%)	Male N (%)	Female N (%)
Hepatitis B virus surface antigen (HBsAg) reactive 74 (21.14%)	12 (16.20%)	5 (6.75%)	36 (48.64%)	21 (28.37%)
HCV Antibody (Anti-HCV) reactive 144 (41.14%)	23 (16.00%)	18 (12.50%)	57 (39.58%)	46 (32.00%)
Co-infection 19 (5.4%)	6 (31.5%)	2 (10.52%)	8 (42.10%)	3 (15.78%)

**RESULTS**

Total 350 previously unscreened patients of ages ranging from 16 to 55 years were included in the study. Patients were grouped according to age: Group 1 (16-35 years) and Group 2 (36-55 years). Patients of either sex, both married and unmarried, having various socioeconomic backgrounds, and previously unscreened were included in the study. All known cases of hepatitis B and C were excluded from the study.

Blood was collected using aseptic technique by an expert phlebotomist. Sera was separated and analyzed on the same date. Screening for Hepatitis B virus surface antigen (HBsAg) and HCV Antibody (Anti-HCV) was done in the clinical laboratory of LGH by ELISA technique.

**Statistical Analysis:**

Data was analyzed using Statistical Package for Social Sciences (SPSS) version 21. Variables were defined qualitatively and frequency distribution was applied. Analysis was carried out using chi square test. P value <0.05 was considered statistically significant.

A total of 350 patients were screened for HBsAg and anti-HCV, 237 patients were found reactive. Results showed that both HBV and HCV reactive cases were more in males as compared to females and HCV reactive cases were 39.58% and HBV reactive cases in males were 16.2% as shown in Table I.

Figure 1 results show the number of reactive cases of HBV 17(7.17%) and reactive cases of HCV 41 (17.29%) in Group 1 (age 16- 35 years). In Group 2 (age 36 to 55 years), the reactive cases of HBV were 57(24.05%) and of HCV were 103(43.45%). Co infection rate in group 1 was 8(3.37%) and 11(4.64%) in group 2.

Comparison of various risk factors and their frequency in HBV and HCV infective individuals in different age groups is shown in Table II and Table III. Majority of the patients (66.41% of HBV and 66.31% of HCV) in Group 2 had the history of visiting community barbers. Dental procedure history was obtained in 67.56% and 65% in HBV and C infections in Group 2. In HBV and HCV reactive cases, history of blood transfusion, dental procedures, shaving from barbers, and body piercing was considered as significant risk factors (p<0.05).

**Table II: Comparison and Frequency of Factors in HBV (n= 74) Infective Individuals in Different Age Groups**

Factors		Group 1 (age 16-35 years) n (%)	Group 2 (age 36-55 years) n (%)	Total n=74 (%)	p value
IV drug	Yes	8 (24.24%)	25 (75.75%)	33 (44.59%)	0.77
	No	9 (22%)	32 (78%)	41 (55.40%)	
Blood transfusion	Yes	15 (31%)	34 (61%)	49 (66.21%)	0.02*
	No	2 (8 %)	23 (92.00%)	25 (33.78%)	
Dental Procedure	Yes	12 (32.43%)	25(67.56%)	37 (50%)	0.04*
	No	5 (13.51%)	32 (86.48%)	37 (50%)	
Hospitalization	Yes	10 (41.66%)	14 (58.33%)	24 (32.43%)	0.008
	No	7 (14%)	43(86%)	50 (67.56%)	
Surgery	Yes	4 (16.66%)	20 (83.33%)	24 (32.43%)	0.37
	No	13 (26%)	37 (74%)	50 (67.56%)	
Barber shave	Yes	15 (36.58%)	26 (63.41%)	41 (55.40%)	0.00*
	No	2 (6%)	31 (94.00%)	33 (44.59%)	
Sharing items	Yes	6 (14.28%)	36 (85.71%)	42 (56.75%)	0.04*
	No	11 (34.37%)	21 (65.62%)	32 (43.24%)	
Tattooing/body piercing	Yes	5 (11.11%)	40 (88.88%)	45 (60.81%)	0.00*
	No	12 (41.37%)	17 (58.62%)	29 (39.18%)	
Family member suffering from HBV	Yes	6 (27.27%)	16 (72.72%)	22 (29.72%)	0.56
	No	11 (21.15%)	41 (78.84%)	52 (70.27%)	

\*p value < 0.05 = statistically significant, Chi-square applied

**Table III: Comparison and Frequency of Factors in HCV (n= 144) Infective Individuals in Different Age Groups**

Factors		Group 1 (age 16-30 years) n = 41	Group 2 (age 40-55 years) n = 103	Total n=144 (%)	p value
IV drug	Yes	19 (33.33%)	38 (66.66%)	57 (39.58%)	0.29
	No	22 (25.28%)	65 (74.71%)	87 (60.41%)	
Blood transfusion	Yes	14 (18.91%)	60 (81.08%)	74 (51.38%)	0.00*
	No	27 (38.57%)	43 (61.42%)	70 (48.61%)	
Dental procedure	Yes	29 (35.00%)	54 (65.00%)	83 (57.63%)	0.04*
	No	12 (19.67%)	49 (80.32%)	61 (42.36%)	
Hospitalization	Yes	15 (31.91%)	32 (68.08%)	47 (32.63%)	0.52
	No	26 (26.80%)	71 (73.19%)	97 (67.36%)	
Surgery	Yes	18 (36.00%)	32 (64.00%)	50 (34.72%)	0.12
	No	23 (24.00%)	73 (76.00%)	96 (66.66%)	
Barber shave	Yes	32 (33.68%)	63 (66.31%)	95 (66.00%)	0.05*
	No	9 (18.36%)	40 (81.63%)	49 (34.00%)	
Sharing items	Yes	19 (38.00%)	31 (62.00%)	50 (34.72%)	0.06
	No	22 (23.40%)	72 (76.59%)	94 (65.27%)	
Tattooing/body piercing	Yes	20 (41.66%)	28 (58.33%)	48 (33.33%)	0.01*
	No	21 (21.87%)	75 (78.12%)	96 (66.66%)	
Family members suffer from HCV	Yes	8 (25.80%)	23 (74.19%)	31 (21.52%)	0.71
	No	33 (29.20%)	80 (70.79%)	113 (78.47%)	

\*p value < 0.05 = statistically significant, Chi-square applied

## DISCUSSION

The worldwide epidemic of hepatitis B and C is a serious health issue as it is the major reason of chronic liver diseases like cirrhosis and hepatocellular carcinoma, if not treated timely<sup>9</sup>.

We have found high prevalence rate of viral hepatitis in our study compared to the previous study reports from Pakistan<sup>10,11</sup>. Several social factors are responsible for the higher prevalence of HBV and HCV, including lack of health and safety standards due to unsatisfactory awareness and knowledge of the disease in the general population, as reported by Shedain PR et al<sup>12</sup>.

Our study observed that in the age Group 2 (36-55 years), a high rate of HCV was present compared to HBV, in both males and females as compared to the younger adults in Group 1. The results are similar to a study conducted by Kinner SA et al, showed prevalence of 70% HCV and 25% HBV in older age group<sup>13</sup>.

We have found that increasing age is associated with the occurrence of HBV and HCV. Similarly, there is a higher risk of co-infection in the older age group. Our study showed that in Group 2 (age 36 to 55 years), the infection rates for HBV, HCV increased to 36.08% and 57.19% respectively. The variation in the seroprevalence of HBV in different age groups could be due to the changing immune response of the body with age to infectious agents, as also supported by the findings reported previously<sup>14</sup>. We also found males to be at a higher risk and barber shaving was significantly associated with HBV and HCV occurrence. Exposure to barber shaving and sharing IV injections, could be promoting the risk of HBV infections in males in our study population.<sup>15</sup> Frequent exposure to barber shaving, surgical and dental procedures, blood donation, and a higher number of injections being important risk factors for HCV infection have been reported elsewhere<sup>16</sup>. A study also found that the incidence rate of viral infection rises with age and with dental therapy<sup>17</sup>. It is observed that in dental procedures, infections can be accelerated via many routes like indirect or direct contact with oral fluids, blood, aerosol, droplet splash, etc. Our results are in line with the findings reported from other regions of the world<sup>4,10</sup>.

Hepatitis C viral infection has been reported to be an emerging epidemic in Pakistan<sup>18</sup>. In our study, an elevating trend of HCV seroprevalence was recorded with an increase in age. This is likely due to a cumulative effect whereby exposure to multiple risk factors increases with age. For instance, the number of child births, recreational drug use, exposure to barbers and

number of injections all increase with age. These results are in line with the findings of Riaz H et al<sup>19</sup>. This might be due to unhygienic environments where a procedure is carried out and the use of unsterilized instruments that are not properly autoclaved and are used on multiple individuals<sup>20</sup>. Other exposure variables found in this study have previously been reported, such as history of hospitalization, surgical procedures, IV injections, tattooing, piercing, barbers shaving, blood transfusion, and family member infected with viral hepatitis B or C<sup>21,22</sup>.

Our study reported that the frequency of co-infection was more in Group 2 (42.10%) in males as compared to Group 1 (31.5%). According to a study, more than 52% of people are co-infected with viral hepatitis<sup>23</sup>. The reason may be the use of injectable medicine and via sexual transmission<sup>24</sup>.

### Limitations of study:

Data concerning vaccination against hepatitis B is self-reported. Besides, the questionnaire was also self-reported. A small number of patients was included in the study.

## CONCLUSION

Major contributors for Hepatitis B and C are the use of unsterilized injections and unscreened blood during dental procedures and blood transfusions, and visits to community barbers. Awareness regarding sterilization for both the age groups may help in reducing the burden of infection in this community.

For elimination of viral hepatitis from the society, there is a need to increase information about the modes of transmission of HBV and HCV, estimation, and surveillance. This may help to identify more people who are at risk of developing viral infection and may help to target control and prevention programmes.

**Authors' contribution:** WS conceived the idea, edited manuscript, proofread and was responsible for the accuracy or integrity of the work. KN did literature search and referencing, data collection and write up. MA collected data and wrote manuscript.

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