

ORIGINAL ARTICLE**SEROPREVALENCE OF HEPATITIS C AMONG THE APPARENTLY HEALTHY BLOOD DONORS OF KARACHI**Maeesa Wadood^{1,2}, Muhammad Usman^{1,2*}, Moinuddin¹, Khansa Qamar¹, Muhammad Rizwan¹, Iram Nazir¹¹ Baqai Institute of Hematology, Baqai Medical University, Karachi, Pakistan² Muhammadi Institute of Hematology and Transfusion Medicine, Karachi, Pakistan

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ABSTRACT

Hepatitis C is a global health issue. Pakistan is among the prevalent countries for hepatitis C virus (HCV). Due to poverty, unemployment, low literacy rate, unawareness and poor health facilities, Pakistani population are susceptible to HCV transmission. As blood transfusion is a potential source of HCV; therefore, this study was designed to determine the recent seroprevalence of HCV among the healthy blood donors of Karachi, Pakistan. For this purpose, 536 blood donors were screened for anti-HCV antibodies by 3rd generation ELISA. The seroprevalence of HCV observed is 2.99% among healthy blood donors. Male predominance is noticed with seropositivity of 2.62%; however, only 0.37% female blood donors were reactive for anti-HCV antibodies. This study concludes that HCV frequency has been increased in the natives of Karachi, Pakistan when compared to the past studies. Therefore, it is recommended that the healthcare authorities should play a vital role in enforcing preventive measures for HCV transmission.

Keywords: Blood Donors, ELISA, HCV screening.**1. INTRODUCTION**

Blood transfusion is one of the most important life saving interventions during surgery, in management of acute blood loss and severe anemia^{1,2}. Therefore, a systematic, well planned blood transfusion service should be ensured that manages the timely supply of safe blood to minimize the risk of transfusion transmitted infections (TTI) in the community³. The initial selection criterion of a healthy blood donor is based on relevant history, examination and screening tests in order to trace the high risk population⁴. Pakistan has a high incidence of blood borne diseases due to poor socioeconomic conditions, unsafe transfusions and lack of awareness of the population for their modes of transmission⁵. Therefore, the World Health Organization (WHO) has recommended the blood screening for HIV infection, hepatitis B, hepatitis C, syphilis and malaria in this region⁶.

Hepatitis C virus (HCV) is a major cause of post-transfusion hepatitis worldwide⁷. It is a single

stranded RNA virus of family Flaviviridae⁸. This blood borne viral infection is characterized by the inflammation of liver parenchyma⁹. The disease is staged in two phases¹⁰. Acute Phase is the period immediately following the infection. It resolves in a few cases within six months. But when the host immune system cannot compete with the virus, it may turn in the chronic phase¹¹. Chronic hepatitis can be further complicated by the compensated or decompensated disease. Chronic infection may progress to hepatic cirrhosis, portal hypertension, variceal bleeding and hepatic encephalopathy¹². In developed countries, the prevalence of HCV infection has declined over the years as they have taken prompt measures to reduce the risk of its transmission. Unfortunately, Pakistan has more than 10 million people suffering from hepatitis C that comprises 6% of the total population¹³. Due to various social and economical norms, the incidence of HCV infection is increasing¹⁴. As blood transfusion is a potential source of this viral illness; therefore, this study was undertaken to determine the changing trends of

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hepatitis C infection among the asymptomatic blood donors of our region.

2. MATERIALS AND METHODS

This study was carried out in the Muhammadi blood bank, NICVD branch, Karachi, Pakistan from June 2015 to May 2016.

2.1. Donor Selection

A total of 536 apparently healthy individuals were included in the study after their informed consent. The selection criteria included:

- i. Age group of 18 to 60 years with no past medical or surgical history,
- ii. Weight >50 kg,
- iii. Hemoglobin level >12.5 g/dL,
- iv. Systolic blood pressure from 100 to 150 mm Hg and diastolic of 60 to 90 mm Hg,
- v. Pulse from 60 to 99 beats/min and
- vi. Temperature from 95 to 99.5 °F.

The donor rejection was made on the following aspects:

- i. Past history of blood donation within 12 weeks,
- ii. Hepatitis B, C or HIV infection,
- iii. Affected by malaria during past one year,
- iv. Any major illness or individual with high risk behavior such as intravenous drug use, commercial sex worker, sex with other men or having multiple sex partners.

2.2. Blood Sampling

Blood sampling was done according to the blood bank's protocol. Each sample was allowed to clot in a glass tube marked with the donor's ID number. Blood was centrifuged for the calibrated time to separate serum. Hemolyzed or gross lipemic samples

were not included in the study.

2.3. Screening Method

Anti-HCV antibodies were screened using third generation anti-HCV enzyme-linked immunosorbent assay (ELISA) kit manufactured by Biocan Diagnostics Inc. (Vancouver, Canada). The method was followed as per the recommendations of the manufacturer. The results greater than or equal to the calculated cutoff value were considered as anti-HCV positive donors. The results less than the cutoff value were interpreted as anti-HCV negative blood donors.

2.4. Statistical Analysis

The data were assembled categorically on Microsoft Excel on the basis of the screening results. The frequency of HCV was calculated among the healthy blood donors of Pakistan.

3. RESULTS

Among 536 blood donors, 519 were male donors and 17 were female donors. The observed seroprevalence of anti-HCV antibodies is 2.99% among healthy blood donors of Karachi, Pakistan as shown in Table 1. The predominant donor population comprised of male blood donors. Hence, the calculated frequency of anti-HCV antibodies between them is 2.62% to 14 reactive cases. Only 2 out of the 17 female donors were reactive for anti-HCV antibodies, therefore, the observed prevalence is 0.37%. A total of 505 males (94.22%) and 15 females (2.8%) were found to be non reactive for anti-HCV antibodies (Table 2). It is interesting to observe that the prevalence of anti-HCV antibodies shows great diversity among blood donors of different areas of Pakistan over 20 years as shown in Table 3.

Table 1. Seroprevalence of Anti-HCV antibody among apparently healthy blood donors of Karachi

Anti-HCV results	Number of Blood Donors	Percentage
Reactive	16	2.99%
Non reactive	520	97.01%

Table 2. Anti-HCV antibody screening among male and female blood donors of Karachi

Results	Males	Frequency	Females	Frequency
Reactive	14	2.62%	02	0.37%
Non-reactive	505	94.22%	15	2.80%

Table 3. Prevalence of HCV among healthy blood donors in Pakistan

S. No.	City	Study Duration	Prevalence	Author
1.	Rawalpindi	Jan 1996 – Dec 2000	4.0%	Khattak et al. ¹⁵
2.	Karachi	Jan 1998- Dec 2002	1.8%	Akhtar et al. ¹⁴
3.	Swat	Jan 2003 – Dec 2005	2.23%	Ahmed ¹⁶
4.	Rawalpindi	April – Sept 2005	2.52%	Chaudhary et al. ¹⁷
5.	Gujranwala	2006	2.34%	Farooqi et al. ¹⁸
6.	Karachi	April 2005 – June 2007	1.5%	Nazar et al. ¹⁹
7.	Peshawar	Jan 2007 – Dec 2008	1.5%	Shah et al. ²⁰
8.	Islamabad	July 2007- June 2008	3.31%	Waheed et al. ²¹
9.	NWFP	2008	4.1%	Khattak et al. ²²
10.	Lahore	2009	17.78%	Akhtar et al. ²³
11.	Islamabad	Jan 2010- Dec 2011	8.34%	Waheed et al. ²⁴
12.	Hyderabad	Jan 2012- July 2012	3.45%	Tunio et al. ²⁵
13.	Islamabad	July 2005- July 2013	3.26%	Zaheer et al. ²⁶
14.	Quetta	2013	20.8%	Khan et al. ²⁷
15.	Multan	2013	3.44%	Hussain et al. ²⁸

4. DISCUSSION

Hepatitis C is a global health concern affecting about 170 million people with high morbidity and mortality²⁹. Pakistan is among the prevalent countries with 10 million people having chronic Hepatitis C. Among healthy blood donors, the prevalence of hepatitis C infection is estimated to be 3%³⁰. As unsafe blood transfusion practice is a major cause of post transfusion hepatitis due to HCV transmission, strict hemovigilance is required⁷. In the early course

of the disease, patients are either asymptomatic or have vague symptoms, i.e. decreases appetite, abdominal discomfort, nausea, arthralgia, etc.³¹ Therefore, the history and clinical examination is not sufficient enough to rule out hepatitis C among blood donors. Hence, it is necessary to screen the donated blood for hepatitis C in order to reduce the potential risk of infection to the recipient³². This study was undertaken with the objective to determine the frequency of hepatitis C infection among

apparently healthy blood donors of Karachi, the metropolitan city of Pakistan.

Our study revealed sero-positivity of 2.99% for anti-HCV antibodies among the blood donors as shown in Table 1. This is consistent with the reported frequency of 3% by Umer et al.³³ in Pakistani blood donors. Over the years, it is observed that the prevalence rate of anti-HCV reactivity has increased slightly in Karachi when compared to the previous studies as presented in Table 3¹⁴⁻²⁸. Akhtar et al.¹⁴ and Nazar et al.¹⁹ had reported the prevalence rate of 1.8% and 1.5%, respectively, among the blood donors of Karachi (Table 3). Male donors are more commonly affected with a prevalence rate of 2.62% as compared to female donors, i.e. 0.37%. This can be due to the fact that males donate blood more frequently. As in Pakistan, the male is generally the sole bread earner of the family; therefore, he is more prone to the occupational risks of HCV transmission.

Multiple factors are implicated in the progressively rising trend of hepatitis C. Firstly, unlike hepatitis B virus, a vaccine for HCV is not available. Secondly, unsafe blood transfusions inevitably exposed many individuals from this virus. Thirdly, unsterilized medical, surgical and dental procedures conducted by quacks and dais in the community have further worsened the situation³². Individuals with high risk behavior; such as Intravenous injection user, homosexuals and commercial sex workers are very difficult to identify due to various social and cultural limitations. Therefore, donors belonging to this group increase the risk of HCV infection. Another cause of this increased susceptibility is by sharing of personal items, like shaving razors, tooth brushes, etc. Body piercing, tattooing and dialysis have also been reported as a cause of HCV spread¹².

5. CONCLUSION

It is concluded that the incidence of hepatitis C is gradually increasing in Karachi due to unawareness of the population, malpractice by health professionals and lack of preventive strategies by the healthcare system. It is, therefore, recommended to take effective preventive measures such as national awareness and

screening campaigns for the population. Reliable screening techniques should be used to screen blood donors. Voluntary blood donations should be promoted as they are less commonly associated with transfusion transmitted infections.

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