

## Appraisal of Hepatitis-B and Hepatitis-C Prevalence

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### ABSTRACT

**Objective:** To assess prevalence of HBV and HCV among healthy blood donors. **Study Setting:** Blood Transfusion Services Center DHQ Hospital Faisalabad. (Blood donation record of blood donors). **Study Design:** Retrospective review of blood donation record of blood donors, who attended this center from 1<sup>st</sup> Jan 2014 To 31<sup>st</sup> Dec 2014. **Materials and Methods:** The blood donation record of 32028 persons was reviewed who visited BTSC DHQ Hospital Faisalabad for donation of blood. The donors were selected according to International donor selection criteria. All the blood donors were screened for HBV and HCV by

“Rapid Method.” **Results:** Review and analysis of blood donation record of 32028 screened blood donors showed that 11.16% blood donors were female (n= 3574) and 88.84% were male (n=28454). Among total, 609 blood donors were HBV positive i.e. 1.90% and 2724 were HCV positive i.e. 8.50%. **Conclusion:** This study concluded that the prevalence of HBV&HCV among healthy blood donors of this area, HBV to be in low endemic group (<2 %) while HCV in high endemic group (>8%). Female donors are proportionately less than male donors. **Key words:** Hepatitis-B, Hepatitis-C, Blood Donors, Blood Transfusion center, Prevalence

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### INTRODUCTION

Viral Hepatitis is infection of the liver caused by any of half dozen viruses. Most commonly identified types are Hepatitis-B virus and Hepatitis-C virus. These viruses are usually transmitted by the parenteral route through contact with infected blood.<sup>1</sup>

Hepatitis-B and Hepatitis-C are endemic all over the world, especially in tropical developing countries and also in some regions of Europe.<sup>2</sup> More than 2 billion people worldwide have evidence of past or current HBV infection and 240 million are chronic carriers of the virus.<sup>7</sup> The deaths amount to 60,000 per year from cirrhosis of liver and hepatocellular carcinoma.<sup>3</sup>

Hepatitis-C is also major cause of parenterally transmitted hepatitis. Every year 3-4 million

people are infected and about 150 million are chronically infected. More than 350,000 people die from Hepatitis related diseases.<sup>30,31</sup> About 3% of the world population have Hepatitis-C and 350 million are chronic carriers.<sup>8</sup> Globally the HCV seroprevalence in blood donors ranges from 0.4% to 19.2%.<sup>5</sup> Among all viral hepatitis infections, Hepatitis-C is very dangerous because of its high morbidity rate.<sup>6</sup>

Although the government of Punjab is striving hard to control hepatitis infection through Hepatitis Control Program in all public secondary (DHQ) and tertiary care (teaching) hospitals but still there is tremendous increase in infection rate due to invasive procedures by nonprofessional traditional healers and certain prevailing cultural factors.

### Rationale

So far no study has been conducted on this subject in this area, that's why this study has been conducted to assess seroprevalence of HBV and HCV among healthy blood donors who belong to various segments of general population.

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## MATERIALS & METHODS

### Study Setting

Blood Transfusion Services Center DHQ Hospital Faisalabad was selected for this study.

### Study Design

Retrospective review of the blood donation record of blood donors who attended this center during study period from 1<sup>st</sup> Jan, 2014 to 31<sup>st</sup> Dec, 2014.

### Inclusion Criteria

All the blood donors who attended this center during study period. They were selected according to the international donor selection criteria, i.e. having age 18-60 years, weight more than 60kg, blood hemoglobin more than Hb >12 g/dl and disease free medical history etc.

### Exclusion Criteria

Those having history of drug addiction, malaria, cardiac /renal/respiratory system lesions and repeated blood transfusions. The pregnant /lactating women were also included in exclusion criteria. Donors who had already donated blood within 3 months were also deferred.

### Operational Definition

HBV and HCV prevalence will be defined in endemic scale as ;

- Highly endemic if prevalence rate is (> 8%).
- Intermediate endemic if prevalence rate is (2-8%).
- Low endemic if prevalence rate is (< 2%).

**Table 1: Record of Blood Donors**

Sr. No	Months-2014	Total Blood Donors	Male B Donors	Male %	Female Blood Donors	Female %
1	January	2793	2602	93.16%	191	06.84%
2	February	2384	2178	91.35%	206	08.65%
3	March	2642	2291	86.71%	351	13.29%
4	April	2429	2091	86.08%	338	13.92%
5	May	2834	2494	88.00%	340	12.00%
6	June	2616	2260	86.39%	356	13.61%
7	July	2432	2103	86.47%	329	13.53%
8	August	2642	2390	90.46%	252	09.54%
9	September	2930	2565	87.54%	365	12.46%
10	October	2696	2482	92.06%	214	07.94%
11	November	2694	2402	89.16%	292	10.84%
12	December	2936	2596	88.42%	340	11.58%
	Total	32028	28454	88.84%	3574	11.16%

Source: BTSC DHQ Hospital Faisalabad blood donors Record from 1<sup>st</sup> Jan 2014 to 31<sup>st</sup> Dec 2014

## Methods

All the blood donors (n=32028) were selected according to International donor selection criteria. After selection, every donor was screened for HBV and HCV by Rapid Screening Method. The test is qualitative, with positive predictive value of 1 in 1000 dilution. All donors (n=28,695) having negative screening test result, were accepted for blood donation while those (n=3,333) having positive screening result were deferred.

## RESULTS

The review of the record of blood donors from 1<sup>st</sup> Jan 2014 to 31<sup>st</sup> Dec 2014, showed that 32028 blood donors attended Blood Transfusion Services Center DHQ Hospital Faisalabad for purpose of blood donation. They were screened for HBV and HCV. As result of screening, 609 HBV positive and 2724 HCV positive individuals were deferred. The results of analysis are being presented in percentage in Table-1 and Table-2.

Table-1: The record of 32028 blood donors shows that 28454 are male (88.84%) while 3574 are female (11.16%).

Table 2: The results of HBV and HCV blood screening shows that among total 32028 screened blood donors, 609 are HBV positive (1.9%) and 2724 are HCV positive (8.50%).

**Table 2: HBV and HCV Blood Screening Results of Blood Donors**

Sr. No.	Months 2014	Total HBV Screened B. Donors	HBV Reactive Donors	HBV+ Results in %	Total HCV Screened B. Donors	HCV Reactive Donors	HCV+ Results in %
01	January	2793	30	1.07%	2793	317	11.35%
02	February	2384	37	1.55%	2384	285	11.95%
03	March	2642	44	1.66%	2642	305	11.54%
04	April	2429	38	1.56%	2429	255	10.50%
05	May	2834	50	1.76%	2834	298	10.52%
06	June	2616	50	1.91%	2616	282	10.78%
07	July	2432	36	1.48%	2432	105	04.32%
08	August	2642	71	2.69%	2642	169	06.40%
09	September	2930	55	1.88%	2930	105	03.59%
10	October	2696	53	1.97%	2696	197	07.31%
11	November	2694	66	2.45%	2694	203	07.54%
12	December	2936	79	2.69%	2936	203	06.91%
	Total	32028	609	1.90%	32028	2724	8.50%

\*Source: BTSC DHQ Hospital Faisalabad blood donors Record from 1<sup>st</sup> Jan 2014 to 31<sup>st</sup> Dec 2014

**Table 3: Comparison of regional HBV and HCV prevalence in Blood Donors**

Ref No.	Study Setting	Year	Author	HBV %	Endemic status	HCV %	Endemic status
This Study	BTSC DHQ Hospital Faisalabad.	2015	Dr Muhammad Arif ALI	1.9 %	Low Endemic	8.50 %	Highly Endemic
9	BTS,PIMS Islamabad	2008	Usman Waheed	1.92%	Low Endemic	3.31%	Intermediate Endemic
10	Baqai Medical University Karachi	2007	Azam M	4.5%	Intermediate Endemic	4.36%	Intermediate Endemic
11	Ghurki Trust T Hospital, Lahore	2007	Ijaz Ali	1.52%	Low Endemic	5.34%	Intermediate Endemic
12	DHQ Hospital Skardu	2006	Aziz MS	8.4%	Highly Endemic	1.1%	Low Endemic
13	Isra University Hospital Hyderabad	2006	Ujjan ID	3.65%	Intermediate Endemic	8.68%	Highly Endemic
14	Fauji F. Hospital Rawalpindi	2006	Chaudhry IA	2.45%	Intermediate Endemic	2.52%	Intermediate Endemic
15	Rehman Medical Institute Peshawar	2004	Ahmad J	1.9%	Low Endemic	2.2%	Low Endemic
16	Shifa International Hospital Islamabad	2004	Asif N	2.51%	Intermediate Endemic	5.14%	Intermediate Endemic
17	Nishtar M college Hospital Multan	2004	Mehmmood MA	3.37%	Intermediate Endemic	0.27%	Low Endemic
18	Shaikh Zayed PGMI Lahore	2005	Sirhindi GA	3.36%	Intermediate Endemic	4.16%	Intermediate Endemic
19	Hayatabad Medical Complex Pesawar	2004	Zaidi A	1.46%	Low Endemic	1.34%	Low Endemic
20	CMH, Quetta	2003	Ali N	-	-	1.87%	Low Endemic
21	QMC Hospital Bahawalpur	2002	Fayyaz KM	7.53%	Intermediate Endemic	-	-
22	AFIT Rawalpindi	2002	Khattak MF	3.3%	Intermediate	4.0%	Intermediate
23	IIMCH Rawalpindi	2002	Mumtaz S	5.86%	Intermediate	6.21%	Intermediate

## DISCUSSION

Blood transfusion has pivot rule in saving human lives during surgical and non-surgical invasive interventions. It is hope for life for thalassemia and shock patients. Many diseases can be transmitted to the patients through the unscreened or improperly screened blood. As per international protocol of blood transfusion, serological screening of blood donors for HBV and HCV is mandatory.

The comparison of recently published studies of HBV and HCV prevalence among healthy blood donors is shown in table -3. The prevalence of HBV and HCV varies in different parts of the country. HBV prevalence varies from 1.46% in Peshawar(19) to 8.4% in Skardu.<sup>12</sup> This study with HBV prevalence of 1.90% is consistent with studies conducted in Peshawar (HBV 1.90%) by Ahmad<sup>15</sup> & (HBV 1.46%) by Zaidi A<sup>19</sup>, in Lahore (HBV 1.52%) by Ijaz AU<sup>11</sup> and in Islamabad (HBV 1.92%) by Usman Waheed.<sup>9</sup> All these studies have prevalence rate <2% and fall in low endemic scale.

While HBV prevalence among healthy blood donors concluded in other studies, in Rawalpindi (HBV 2.45%) by Chaudhary IA<sup>14</sup>, in Islamabad (HBV 2.51%) by Asif N<sup>16</sup>, in AFIT Rawalpindi (HBV 3.3 %) by Khattak MF,<sup>22</sup> in Lahore (HBV 3.36%) by Ijaz AU,<sup>11</sup> in Multan (HBV 3.37%) by Mehmood MA,<sup>17</sup> in Hyderabad (HBV 3.65%) by Ujjan ID,<sup>13</sup> in Karachi 4.5% HBV prevalence by Azam M,<sup>10</sup> 5.86% HBV prevalence in Rawalpindi by Mumtaz<sup>23</sup> and 7.53% HBV prevalence in Bahawalpur studied by Fayyaz KM,<sup>21</sup> are in intermediate endemic zone (>2-8%).

So far as per results of reference studies, only Skardu with 8.4% HBV prevalence rate<sup>12</sup> is in high endemic area (>8%) and reason may be lack of vaccination and health education facilities.

In case of HCV prevalence in healthy blood donors, low endemic areas (<2%) HCV prevalence are, Multan 0.27% HCV prevalence<sup>17</sup>, Skardu HCV 1.1%<sup>12</sup>, Peshawar HCV 1.34%<sup>19</sup> and Quetta HCV 1.87%<sup>18</sup>, while intermediate endemic zones (>2-8%), are Peshawar HCV 2.2%<sup>15</sup>, Three studies in Rawalpindi HCV 2.52%<sup>14</sup>, HCV 4% (22) and HCV 6.21%<sup>23</sup>, Two studies in Islamabad HCV 3.31%<sup>9</sup> and HCV

5.14%<sup>16</sup>, two studies in Lahore HCV 4.16%<sup>18</sup> and HCV 5.34%<sup>11</sup>, while in Karachi HCV 4.36%.<sup>10</sup> Study conducted by Ujjan ID in Hyderabad with 8.86% HCV prevalence<sup>13</sup> lies in high endemic zone (>8%) and our study with 8.50% HCV prevalence is also consistent with Ujjan study.

The prevalence of HBV and HCV among healthy blood donors vary from country to country. In Nepal HBV 0.82% and HCV 0.47%<sup>6</sup>, in Turkey HBV 1.38% and HCV 0.35%<sup>27</sup>, in Kingdom of Saudi Arabia HBV 1.5% and HCV 0.4%<sup>24</sup>, in Brazil HBV 3.3% and HCV 5.9%<sup>26</sup>, in Egypt HBV 4.3% and HCV 2.7%<sup>28</sup> while in Georgia HBV 3.4% and HCV 6.9%.<sup>29</sup>

So regarding HBV prevalence, internationally this study is consistent with studies conducted in Nepal, Turkey, KSA while HCV prevalence is in higher endemic state than most of the international studies.

## CONCLUSION

This study concludes that in this region, prevalence rate of HBV among healthy blood donors is of low endemic scale while HCV prevalence is of high endemic nature. Female donors are proportionately less than male donors. The HBV prevalence is lower than HCV prevalence, reason being may be availability of efficient vaccine through EPI program, better awareness and certain unknown environmental factors.

## RECOMMENDATION

Health is State responsibility. It is recommended to the government to induce Hepatitis awareness health education on mass level, legislation for food handlers and invasive procedure practicing professional and non-professional traditional healers.

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