ABSTRACT

Objectives: To find prevalence of hepatitis C virus in blood volunteer donors.

Method: Total 150 male and female volunteer blood donors were included in this study. Analysis was done for antibodies to hepatitis C virus by ELISA.

Results: Out of 150 volunteer blood donors 7 (4.66%) found anti-HCV positive.

Conclusion: The study shows the prevalence of HCV in blood donors of Karachi which very high i.e. 4.66%. strict promulgation of the recommendations for the blood transfusion services by WHO and massive public awareness is required.

Keywords: Hepatitis C virus, blood donors, ELISA.

INTRODUCTION

Viral Hepatitis remains a major public health problem all over the world1,2. The common agents causing viral hepatitis are HAV, HBV, HCV, HDV, HEV, HFV and HGV3. Viral hepatitis C infects an estimated 170 million persons world wide. In USA nearly 150,000 cases occur yearly, one tenth of which results from blood transfusions and this represents a viral pandemic4 that is five time as wide spread as infection with human immune-deficiency virus type I (HIV I)5,6. Humans seem to be the sole source of infection with hepatitis C virus and inoculation with blood and blood products are the best recognized mode of transmission5. Since it has a parenteral route it can be transmitted by blood or blood products, un-sterilized syringes, instruments used in surgery and certain risk factors include hemodialysis, hemophiliacs, hospitalization, dental work, barber razor, tattooing, acupuncture and needle shearing etc7. The incubation period is about 7 weeks (ranging 3-30 weeks). HCV is rarely diagnosed in acute phase and is known to be a silent killer because on most of the cases it is asymptomatic8.

Progression to chronic disease occurs in the majority of HCV infected persons and infection with the virus has become the main indication for liver transplantation9. HCV infection also increase the number of complications in a persons who are co infected with HIV I. Hepatitis C virus is notorious for its chronicity leading to chronic liver disease, cirrhosis and hepatocellular carcinoma in the recipients of anti HCV positive blood in due course of time8.

The prevalence of HCV antibodies among blood donors have been reported in several studies and appear to differ geographically. Prevalence is lower (0.2-0.8%) in Northern Europe and USA but higher in the Mediterranean Countries and Japan10. The highest number of infection reported in Egypt for
positive HCV antibodies, which is 19.10%. In Pakistan, the prevalence of HCV infection is very high\(^5\).

Hepatitis C virus was first identified in 1988 in Chimpanzee Plasma by Cloning of infected person\(^15,16\). HCV is an RNA virus that belongs to the Fevi virus family. The natural targets of HCV are hepatocytes. Replication occurs through an RNA dependent RNA polymerase that presents a major challenge with respect to immune mediated control of HCV\(^7\).

It is likely that the number of deaths attributable to HCV related chronic liver disease will increase substantially during the next two decades and the potential economical and clinical burden related to HCV is straggling\(^6,10\).

The diagnosis of HCV is based on clinical grounds, lab tests demonstrating hepatic injury, anti HCV and confirm by detecting HCV RNA by polymerase chain reaction (PCR)\(^8\).

**MATERIAL AND METHODS**

This study was carried out at The Department of Microbiology, BMSI, JPMC, Karachi. 150 samples were collected from volunteer blood donors both male and female were included. All subjects were adults, over 18-47 years of age. Sera separated by centrifugation and stored at -20 Degree Celsius. Analysis was done for antibodies to hepatitis C virus by enzyme linked immunosorbent assay (ELISA). In this study Abbot EIA third generation kit solid phase immunoassay was used.

For qualitative enzyme immuno assay for antibodies to hepatitis C virus. It is specific and sensitive test. It requires only a small amount of serum. Reagents used in the tests are stable and have a long shelf life. Other advantages of the test are that the result of the test can be used usually and large number of specimens can be tested simultaneously.

**PRINCIPLE**

Serum is diluted in the specimen diluent and incubated with a polystyrene bead coated with recombinant HCV antigen. If antibody is present in the sample, immunoglobulins in the patients sample are affixed to the coated bead during incubation. After removing the unbound materials and washing the bead, immunoglobulins remaining bound to the solid phase are detected by incubating the bead-antigen-antibody complex with a solution containing horseradish peroxidase labeled goat antibodies directed against human immunoglobulins (heavy and light chains). Unbound enzyme conjugate is then removed and beads are washed. Next, o-phenylenediamine (OPD) solution containing hydrogen peroxide is added to the bead and, after incubation, a yellow-orange colour develops in proportion to the amount of anti-HCV which is bound to the bead.

**RESULTS**

Out of 150 blood donors, 138 were male and only 12 were female with age ranging 18 to 47 years.

7 subjects were found positive for HCV antibodies out of which 6 were male and 1 was female. Total prevalence rate is to be 4.66%.

**Sex and age wise distribution**

<table>
<thead>
<tr>
<th>Sex</th>
<th>Number</th>
<th>Percentage</th>
<th>Mean Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>138</td>
<td>92%</td>
<td>28.25</td>
</tr>
<tr>
<td>Female</td>
<td>12</td>
<td>8%</td>
<td>22.83</td>
</tr>
<tr>
<td>TOTAL</td>
<td>150</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Result of Anti HCV Positive Cases**

<table>
<thead>
<tr>
<th>Number of cases</th>
<th>Anti HCV negative</th>
<th>Anti HCV positive</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>143</td>
<td>07</td>
<td>4.66%</td>
</tr>
</tbody>
</table>
DISCUSSION

Viral Hepatitis is endemic in developing countries like Pakistan and is punctuated by periodic outbreaks. However the prevalence varies from area to area and population to population due to variability and socioeconomic conditions. The prevalence is particularly high in blood donors\(^1\). In our study there were 150 volunteer blood donors among all, maximum were between ages of 18-37 years. Similar results are shown by a study conducted in Karachi that maximum number of blood donors were in the age ranging between 18-37 years\(^\). There was no statistical difference between age groups in acquiring HCV infection, as HCV infection depends on exposure to virus, so all age groups are equally at risk. Our study consists of 150 volunteer blood donors including 138 (92%) male and 12 (8%) female donors. Male predominance in donors reflects the social and cultural makeup of our society as male donate more blood than female. In a study conducted in Taiwan, most of their blood donors were male, this study also coincides with above findings\(^1\).

In our study 7 out of 150 subjects were found anti HCV positive, among these 6 subjects were male and 1 was female. According to a report from Saudi Arabia, the Pakistani population living there has shown prevalence rate 3.7% in general population and 2% in blood donors\(^2\). In Taiwan prevalence rate of anti HCV positivity among blood donors were reported to be 1.6 %\(^3\). The highest prevalence was reported in Egyptians which is 19.10%\(^4\). 4.1% HCV positivity was reported in another study conducted in Lahore Pakistan\(^5\).

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The prevalence of HCV in blood donors varies from county to country, we found that 73 donors (49.33%) had a history of previous blood donations while 77 subjects were first time donors. Out of 7 HCV positive cases, there were 4 donors who had donated blood repeatedly. Prevalence of anti HCV positivity of 4.66% in our study in blood donors and presence of 57% (out of 7) anti HCV positive donors who had repeatedly donated blood previously indicates the dangerous pool that is spreading HCV infection.

The tendency for causing chronic Hepatitis and our inability to produce an effective vaccine against Hepatitis C calls for the prevention strategy to be the sole preventive measure. The introduction of screening method for HCV antibodies during 1992 had dramatically decreased the risk of transfusion associated hepatitis C infection\(^6\).

CONCLUSIONS

According to our study we make the following conclusion:
The study shows the prevalence of HCV in blood donors in Karachi, which is very high i.e. 4.66%. These figures indirectly show the prevalence of Hepatitis C in the general population. Use of contaminated needles (re-used), blood and blood products should be avoided as a preventive strategy. Proper precautions should be taken during tooth extraction, acupuncture, tattooing, nose and ear piercing and during minor and major surgical procedures. All the instruments used for such purpose should be properly sterilized. Print and electronic media should be used to launch an educational campaign to create awareness among people about HCV infection.

REFERENCES


