Rising trends of HCV infection over a period of 4 years among blood donors in central India: A retrospective study

Objective: The aim of the study was to find out the sero-prevalence of Hepatitis C infection among blood donors. Materials and Methods: All collected blood bags were screened for anti-hepatitis C virus antibodies (HCV Ab; MicroELISA 3rd generation, J. Mitra) during the study period of 4 years and data were analyzed. Results: A total of 28621 blood donors were screened for transfusion transmissible infections (TTIs) in which 80 donors were positive for Hepatitis C infection, constituted 11% of total sero-reactive donors. In 2009, only 10 cases were sero-reactive while in 2012, 36 cases were sero-reactive for Hepatitis C infection. Conclusions: Hepatitis C infection among blood donors are in rising trends in this study area. Voluntary donors are safer than replacement donors as they have very low sero-prevalence. As these blood donors represent the highly selective community of a general population in most of the countries. So the actual sero-prevalence of hepatitis C infection may be more in the general population. Promoting HCV screening, voluntary blood donation, diagnosis and treatment among blood donors are very important measures to control the transmission of HCV infection, decrease sero-reactive cases and ensure safe blood collection. Key words: Blood donors, hepatitis C infection, sero-prevalence

INTRODUCTION

HCV is recognized as the primary cause of transfusion-associated non-A-non-B viral hepatitis worldwide,[1] and is endemic in West Africa.[2] Hepatitis C virus (HCV) cause serious mortality, morbidity and financial burden, thus are major global health problem.[3] The actual prevalence of HCV is difficult to assess because serological tests do not discriminate among acute, chronic, or resolved infection and the analyzed groups in most countries are not representative of the general population.[4] However; most studies use blood donors as prevalence to report the frequency of HCV usually by anti-HCV antibodies and do not report follow-up HCV testing. Using blood donors as a prevalence source may underestimate the actual prevalence of the virus because donors are generally a highly selected population.[5] The aim of this study, was to find out the sero-reactive cases of Hepatitis C infection among blood donors during 4 years in central india.

MATERIALS AND METHODS

The study was carried out in the Blood bank attached to a tertiary care hospital, Central India over a period of 4 years from January 2008 to December 2012. It was a retrospective study. All blood donations collected during this period were included. The donors were either voluntary or replacement donors. Replacement donors were either relatives or friends of patients.

All blood bags were screened for hepatitis B surface antigen (HBsAg; Hepalisa, J. Mitra), anti-human immunodeficiency virus antibodies (HIV Ab; HIV 3rd generation kit for detection of antibodies to HIV1 and HIV2, J. Mitra), anti-hepatitis C virus antibodies (HCV Ab; MicroELISA 3rd generation, J. Mitra) and Venereal Diseases Research Laboratory (VDRL) reactivity (Carbogen kit, Tulip Diagnostics). The data were analyzed with respect to sero-reactive cases.
RESULTS

A total of 28621 blood donors were screened for transfusion transmissible infections (TTIs) during the study period in which voluntary donors were 23133 while the replacement donors were 5488 as shown in [Table 1].

A total of 728 blood donors were found positive for transfusion transmitted infections (TTIs) during the study period in which Hepatitis B was the most common infection followed by HIV and then, Hepatitis C infection. There is gradual rise in HCV infection per year as shown in [Table 2].

Rising trends of HCV infection among blood donors and sero-prevalence of Hepatitis C infection was shown in [Table 3].

Using Chi-Square Value, significant association was found between blood donors and HCV infection in four years duration.

Distribution of HCV infection among replacement donors as well as voluntary donors was shown in [Table 4].

DISCUSSION

With every unit of blood, there is 1% chance of transfusion associated problems including TTI.[6] The risk of TTI has declined dramatically in high income nations over the past two decades, primarily because of extraordinary success in preventing HIV and other established transfusion transmitted viruses from entering the blood supply.[7]

Many studies including studies done by Rao and Annapurna et al.,[8] in Pune, Rose et al.,[9] in Vellore, Arora et al.,[10] in Southern Haryana, Singh et al.,[11] in Coastal Karnataka, Pahuja et al.,[12] in Delhi and Singh et al.,[13] showed that more than 90% were male donors as also in our study.

Among the studies done, Garg et al.,[14] have reported an HCV prevalence of 0.28% in blood donors of Western India. Similar studies by Sri Krishna et al.,[15] have noted a prevalence of 1.02%, Sood et al., and Pahuja et al., have reported a high prevalence of 2.2 and 2.23% in Delhi, respectively.[16] Added to this, HCV prevalence by Kaur et al.,[17] was 0.78%, Singh et al., was 0.5% and Jain et al., it was 1.57% in New Delhi voluntary blood donors.[18] Internationally, various studies[19] have reported an HCV prevalence range of 0.42-1.2%.

The studies[20-12] have showed high sero-positivity rate in replacement donors compared to voluntary donors, a similar findings was noted in our study. Chandra et al.,[21] have found almost negligible infectivity rate in voluntary donors and also no voluntary donors was found to be positive for HIV by Arora et al.[6]

Among male blood donors in Karachi, Pakistan, the sero-prevalence of HCV was 1.8% with a trend of increasing proportion of positive donors from 1998-2002.[7] Then 26.6% among 188 blood donors and 22% among 163 donors were positive with both studies done in Cairo,[18,19] Rates were lower in Saudi Arabia (1.8%) and Yemen (2.1%).[20,21] In China, prevalence rates were generally low with rates around 1% among donors in Beijing and Wuhan.[22,23]

Mathai et al.,[24] (1994-96) Trivandrum, Kerala observed that most common infection was Hepatitis C infection (1.4%) followed by Hepatitis B infection (1.3%) and both HIV and syphilis each were seen in 0.2% of donors.

Shrestha et al.,[25] (2004-2007), Nepal, observed that Hepatitis C infection (0.64%) was most common infection followed by Hepatitis B (0.64%), syphilis (0.48%) and HIV 0.12% of total donors.

Chandra et al.,[26] (2001-2006) Lucknow, U.P. observed that Hepatitis B infection was most common (1.96%) followed by Hepatitis C infection (0.85%), HIV (0.23%) and syphilis was 0.01%.
Bhawani et al.,[28] (2004–2009) observed that Hepatitis B (1.41%) was most common infection followed by Hepatitis C infection (0.84%), HIV (0.39%) and syphilis was 0.08%. The prevalence rate among plasma donors was significantly higher than among whole blood donors (15.53% vs 9.7%). It was observed that no significant difference was found in HCV infection rates between male and female blood donors and the prevalence of HCV infection was found to increase with age.

In a study, done by Pallavi et al.,[29] found that the incidence of Hepatitis C infection is more in replacement donors (0.23%) than voluntary donors (0.20%).

Numerous researches have shown that paid blood donors are more likely to be infected with HCV than either employer-organized donors or true voluntary donors.[27] Those paid donors who were attracted by high compensation and chose to donate blood in illegal blood stations, also risked a greater risk of cross-contamination. The prevalence rate among plasma donors was significantly higher than among whole blood donors (33.95% vs 7.90%), possibly due to cross-contamination of blood collection equipment by HCV positive plasma donors.[30] The elimination of paid plasma and whole blood donation could contribute to a reduction in HCV infection among blood donors.

In our study there were no paid donors.

CONCLUSION

Hepatitis C infection among blood donors are in rising trends in this study area. Voluntary donors are safer than replacement donors as they have very low sero-prevalence. As these blood donors represent the highly selective community of a general population in most of the countries, so the actual sero-prevalence of Hepatitis C infection may be more in the general population. Promoting HCV screening, voluntary blood donation, diagnosis and treatment among blood donors are very important measures to control the transmission of HCV infection, decrease the sero-reactive cases and ensure safe blood collection.

<table>
<thead>
<tr>
<th>Different regions of India</th>
<th>Prevalence of HCV(%)</th>
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<tbody>
<tr>
<td>Ludhiana[29]</td>
<td>1.09</td>
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<tr>
<td>Delhi[11]</td>
<td>0.66</td>
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<tr>
<td>Lucknow[10]</td>
<td>0.85</td>
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<tr>
<td>Southern Haryana[8]</td>
<td>1.0</td>
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<tr>
<td>West Bengal[30]</td>
<td>0.31</td>
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<tr>
<td>Bangalore[31]</td>
<td>1.02</td>
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<tr>
<td>Present Study</td>
<td>0.28</td>
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by ELISA, recombinant immunoblot assay and polymerase chain reaction. APMIS 1992;100:851-5.


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