Blood Transfusions: Are They Life Saving or Transfusing Infections?

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Abstract: Introduction: There is a risk of 1 - 2 per 1000 recipients receiving contaminated blood with viral, bacterial and parasitic agents. TTI’s are the most commonly encountered complications in transfusion medicine. The objective of the study was to determine the seroprevalence of TTI’s among blood donors, who represent healthy population at large. Materials & methods: A total of 33,658 blood units were received from voluntary and replacement donors over a period of 5 years. Surface antigen of HBV and antibodies to HIV and HCV were determined using ELISA. Syphilis was detected using TPHA test. Results: 947 (2.81%) blood units tested positive for HBV, HCV, HIV and/or syphilis. Overall prevalence was HBV – 1.77%, HCV – 0.13%, HIV – 0.63% and Syphilis – 0.28%. Nine (0.03%) donors had coinfections. Conclusion: The screening of blood donors is the corner stone in assuring the safety of blood transfusion.

Key Words: Transfusion Transmitted Infections; HBV; HCV; HIV; Syphilis

Introduction:
Transfusion of blood and blood components as a specialised modality of patient management saves millions of lives worldwide. Getting safe blood is becoming increasingly difficult because of blood borne infections like Hepatitis B virus (HBV), Hepatitis C virus (HCV), Human immunodeficiency virus (HIV) & Treponema pallidum. There is a risk of 1–2 per 1000 recipients receiving contaminated blood with viral, bacterial or parasitic agents. According to WHO estimate the lack of effective screening of blood donors’ results in up to 16 million new infections with HBV, 5 million new infections with HCV, 1, 60,000 new cases of HIV infections every year. HIV, HBV & HCV are known to cause co-infections due to common route of transmission. The viruses are partners in crime augmenting the pathogenesis & there by increasing the morbidity & mortality.

Evaluation of data for the prevalence of transfusion transmitted infections (TTI’s) permits an assessment of acquisition of these infections in the blood donor population & consequently the safety of the collected blood donations. It also gives an idea of epidemiology of these infections in the community.

Materials and Methods:
A total of 33,658 units of blood were collected from both voluntary and replacement donors over a period of 5 years (Jan 2006 – Dec 2010) at blood bank attached to Mysore Medical College & Research Institute, Mysore, Karnataka, India. Samples were screened for HBV, HCV, HIV & Syphilis. HBV screening was done using ERBALISA kit to detect HBsAg using polyclonal antibodies against surface antigen of Hepatitis B virus. ERBALISA kit was used to detect HCV antibodies using a mixture of synthetic peptides & recombinant proteins of HCV that is CORE NS, NS, & NS. ERBALISA kit HIV 1 / HIV 2 a solid phase immunoassay utilising a mixture of synthetic peptides for detection of HIV1 & HIV2 antibodies was used to detect HIV. Validity of ELISA tests was assessed by means of acceptance criteria laid down by the manufacturer. A rapid TPHA test for the diagnosis of syphilis to detect IgG & IgM antibodies to Treponema pallidum was used. Seropositive blood units were discarded. Infected donors were referred for specialist care.

Results:
A total of 33,658 blood samples were included in the study during the period Jan 2006 – Dec 2010. 947 (2.81%) blood units showed seropositivity for TTI’s.

Table: Seroprevalence of various Transfusion Transmitted Infections

<table>
<thead>
<tr>
<th>Year</th>
<th>Total donors</th>
<th>HBV</th>
<th>HCV</th>
<th>HIV</th>
<th>Syphilis</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>06487</td>
<td>111 (1.31%)</td>
<td>0</td>
<td>047 (0.55%)</td>
<td>080 (0.99%)</td>
</tr>
<tr>
<td>2007</td>
<td>06590</td>
<td>091 (1.38%)</td>
<td>020 (0.35%)</td>
<td>049 (0.74%)</td>
<td>250 (3.83%)</td>
</tr>
<tr>
<td>2008</td>
<td>06404</td>
<td>166 (2.59%)</td>
<td>140 (2.22%)</td>
<td>044 (0.69%)</td>
<td>30 (0.47%)</td>
</tr>
<tr>
<td>2009</td>
<td>06257</td>
<td>081 (1.39%)</td>
<td>100 (1.65%)</td>
<td>040 (0.64%)</td>
<td>110 (1.82%)</td>
</tr>
<tr>
<td>2010</td>
<td>05941</td>
<td>127 (2.14%)</td>
<td>100 (1.63%)</td>
<td>032 (0.54%)</td>
<td>260 (4.34%)</td>
</tr>
</tbody>
</table>

Total 33,658 596 (1.77%) 450 (1.33%) 212 (0.63%) 94 (0.28%)

Nine donors had co-infections of which six were co-infected with HIV & HBV, two of them were infected with HIV & HCV & one donor with HBV & HCV.

Discussion:
In recent years there has been a special interest in donor selection strategies in blood banks in order to provide safer blood supply. There is no screening method to reduce the risk of TTI’s to zero. It appears that it is essential to adopt strict criter-
blood and its components. Considering the various risks in transfusions, we have to adopt stringent measures for blood donor screening, by using more sensitive methods to detect infections early, like Nucleic acid amplification technology (NAT) assays.

Conclusion: Considering the various risks in transfusions, we have to adopt judicious blood transfusions and sensitive technologies for screening of blood donors in order to safeguard recipients of blood and its components.

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References: