Prevalence and Incidence Of Transfusion Transmitted Infections Amongst VNRBDs In Central India

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Abstracts: Background: The aim of this study is to present the status of transfusion –transmitted infections among the apparently healthy donors so as to increase the awareness of complications of blood transfusion and make the clinicians more vigilant with regard to judicious use of blood. Methodology: A total of 15322 units of donor's blood were screened from January 2008 to December 2010 at blood bank of C R Gardi Hospital and R D Gardi medical college. Results and Conclusion: The result of screening showed total seropositive samples for hepatitis B were 288 (1.88%), hepatitis C 52 (0.34%), human immunodeficiency virus 57 (HIV; 0.37%) and Venereal Disease Research Laboratory Test 135 (VDRL; 0.88%) by using enzyme linked immunosorbent assay (ELISA) methods, and rapid plasma regain (RPR) method for syphilis. [Jain R NJIRM 2015; 6(4): 82-85]

Key Words: hepatitis B; hepatitis C; HIV; Syphilis; seroprevalence.

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Introduction: Blood transfusion can be a life saving intervention. However, like all treatments it may result in acute or delayed complications and carries the risk of transfusion–transmissible infections including HIV, hepatitis B & C, syphilis and malaria etc [1, 2, 3, 4, 5, 7]. Appropriate clinical use of blood and supply of safe blood and blood products can minimize such complications and risks. It should, therefore, be obligatory on those who are involved in transfusion of blood to a patient that blood transfusion should not harm the patient. There are number of ways by which risk can be reduced and it includes improving donor selection and direct screening of blood for evidence of presence of infectious agents or markers produced by them. This study was undertaken to know the prevalence rate of infectious markers among blood donors.

Material and Methods: A prospective study was conducted with the permission of ethical commite, from January 2008 to December 2010 and A total of 15322 units of blood was collected from donors (voluntary & replacement) from January 2008 to December 2010 at our Blood Bank. Donors were selected by taking history, clinical examination and following strict donor's selection criteria to eliminate professional donors. All the samples were screened for hepatitis B surface antigen (HBs Ag), HIV (1and 2), hepatitis C virus (HCV) by ELISA method using approved commercially available kits. Screening for VDRL was done by Rapid Plasma Reagin method. All the reactive samples were repeat tested before labelling them seropositive and respective blood units were discarded.

Results: During the study period, the donation of 15,322 units, both from voluntary and replacement donors were subjected to the routine TTI screening by ELISA method. Of these, 532 blood donors were found to be seroreactive. Among these 532 seroreactive cases, 57 cases were HIV positive, 288 donors were reactive for HBsAg, 52 donors were HCV positive and 135 were VDRL positive. There were 14 cases of co-infection (HIV + VDRL − 4; HIV + HBV − 1; HIV + HCV − 4; HCV + HBV − 1; HCV + VDRL − 1; HBV + VDRL − 3). As per age-wise distribution, 138 donors TTI positive blood donors were below 25 years of age, 287 TTI positive blood donors were between 26 and 35 years of age and 107 TTI positive blood donors were above 35 years

Distribution of TTIs Positive Blood Donors: Less than 25 yr: 138 Donors, 25 Yr to 35 Yr: 287 Donors, 36 yr to 45 ys: 107 Donors, Total TTIs Positive Blood Donors: 532. The gender-wise distribution was as follows: There were 527 male and five female donors.

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Amongst 532 TTI positive blood donors, 238 were married and 294 were unmarried.

The TTI-reactive donors (532) for various markers were contacted, 184 (34.59%) telephonically and the remainder 384 (65.41%) who could not be contacted on phone were contacted by post maintaining confidentiality. One hundred and fifty-eight (85.87%) among the 184 donors gave a positive history of high-risk behaviour that was not expressed earlier by them during pre-donation counselling and are now on regular treatment for their infection. The remaining 348 (65.41%) reactive donors were non-responders, which is a fairly large number.

Discussion: Recent studies in the West have shown that the estimated risk of transfusion – transmitted HIV, HCV and to a lesser extend HBV via blood products is very low [3-14]. Primarily because of success in preventing HIV and other established transfusion –transmitted viruses from entering the blood supply. HBV is a major source of transfusion transmitted hepatitis and is associated with a carrier state and chronic liver disease [5, 6, 7, 8, 9, 10, 11, 12].

In the present study the incidence of HBsAg was 1.6 % in 2008, 1.87 % in 2009 and 2.17% in 2010 and overall incidence was 1.88%, in contracts, seropositivity of HBV in another Indian study was observed to be 1.55% in 1996, which came down to 0.99% in 2002 [9]. Seroprevalence of HBsAg in various other Indian studies has been shown to range between 1.86% to 4% [2, 4, 7, 8, 9, 10, 11, 16, 17].

In present study the prevalence of seropositivity for anti-HCV was found, from 0.38% in year 2008 to 0.27 % in 2009 and 0.37 % in 2010 which was lesser as compared to HBsAg positivity. HCV is transmitted primarily through blood exposure. In contrast to HBV, about 20 to 40% of HCV cases are acute and majority of them progress to chronic infection. The long term risk of developing cirrhosis and hepatocellular carcinoma is greater in HCV infected individuals than in those infected with HBV. Indian studies indicate that seroprevalence of HCV ranges between 0.4% to 1.09% [4, 6, 7, 8, 12, 14, 17, 18, 19, 20, 21]. The incidence of HIV seropositivity was 0.41% in 2008, 0.38 % in 2009 and 0.32 % in the year 2010. The seropositivity of HIV has declined in last three years from 0.41 % to 0.32 %. The HIV seroprevalence in Indian scenario has been reported between 0.2% to 1% [9, 17, 18, 19, 20, 21]. The risk of acquiring HIV from a window period donor based on testing for HIV antibody has been reported to be 1 in 4,93,000 units transfused in the US. It has been estimated that HIV-NAT (nucleic acid amplification technique) has reduced the window period from 16 days to 10 days and thus the residual risk following NAT implementation has diminished to 1 in 9,86,000 units [8]. The VDRL reactivity has shown minimal number of positive samples as compared to other.

In the present study incidence of HBsAg seropositivity was found to be the highest as compared to other transfusion –transmitted infections. Since the introduction of NAT in the screening procedure of blood donations, the estimated risk of HCV and HIV infections has decreased significantly. During the 'window period' of hepatitis B, detection of the IgM class of antibodies to the hepatitis B core antigen (Anti HBc – IgM) serves as a useful marker which indicates a recent infection. Therefore, it is strongly suggested that this marker must be utilized for screening of blood units to detect the hepatitis B during the window period.

In this study the maximum and minimum prevalence rate of HIV was 0.41 % in 2008 and 0.32 %in 2010 respectively. Though the reactivity for VDRL is 0.88% in present study but it is essential to exclude high risk donors. Transfusion transmitted syphilis is not a major hazard in modern blood transfusion therapy. Only rare cases of transfusion transmitted syphilis have been documented. The rapid plasma reagin test is commonly used for screening the blood products for syphilis. It is not the transmission of syphilis that is worrisome, being a sexually transmitted disease, it's presence points towards donor's indulgence in "high risk" behaviour and consequent higher risk of exposure to infections like HIV and hepatitis (5). The increased risk of TTI of HBV, HCV and HIV could be minimized by introduction of few more tests for screening of donor's sample. Introduction of nucleic acid amplification testing (NAT) for HCV, HIV, anti-hepatitis B core antigen (HBcAg) and IgM for hepatitis B infection is recommended to detect the infections during window period.

Conclusion: To conclude, with the implementation of strict selection criteria of donor as per the guidelines laid down for blood banks in the gazette notification by the Government of India and use of sensitive laboratory screening tests, it is possible to decrease the incidence of seropositivity of transfusion-transmitted infections and improve the blood product safety. Our study showed that most of the donors were voluntary donors with male preponderance. In all the markers tested there was increased positivity rate amongst the replacement donors as compared to the voluntary donors. Based on these results non remunerated and repeat voluntary blood donor services are needed. There should be an establishment of a nationally coordinated blood transfusion services. All blood should be tested for compatibility and TTI's with reduction in unnecessary blood transfusion. Thus ensuring safe blood supply to the recipients. With the implementation of strict donor selection criteria, use of sensitive screening tests and establishment of strict guidelines for blood transfusion it may be possible to reduce the incidence of TTI in the Indian scenario.

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