Trends in Seroprevalence of Hepatitis C and Syphilis in North Indian Tertiary Health Care Center-A Five Year Retrospective Study

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(Received: 04 March 2012; accepted: 10 June 2012)

Transfusion transmissible infections like human immunodeficiency virus (HIV), Hepatitis B, Hepatitis C and syphilis are the greatest threats for the recipients blood products. This study aimed to determine the seroprevalence trends of hepatitis C and syphilis in the last five years. A retrospective analysis of blood donors from January 2007 to September 2011 was conducted in blood bank in JN Medical College, AMU Aligarh. Blood samples were screened for anti HCV by enzyme linked immunosorbent assay (ELISA) and syphilis by rapid plasma reagin (RPR). A total of 53950 healthy blood donors were tested, out of which 51266 (95.02%) were males and 2684 (4.98%) were females. The overall Seroprevalence of HCV and syphilis was 169 (0.31%) and 164 (0.30%) respectively. There were 21(0.19%) cases of HCV in 2007, 27 (0.26%) in 2008, 35(0.36%) in 2009, 38(0.32%) in 2010 and 48 (0.42%) in 2011 showing increased prevalence from 2007 to 2011. No such increasing trend was seen in case of syphilis;however there was sudden increase in seroprevalence of syphilis in 2011 due to change in the testing kit which was more sensitive.

Key words: Hepatitis C, Syphilis, Seroprevalence.

Transfusion transmitted infections continue to thwart safe blood transfusion worldwide. Every country needs to meet its requirements for blood and blood products and ensure that blood supplies are free from transfusion transmitted infections. With proper selection of donors on the basis of detailed clinical history and examination, along with application of sophisticated screening procedures, chances of transmission of diseases through transfusion have reduced considerably. Hepatitis C virus (HCV), the main etiological agent of the clinical entity formerly known as Non-A, Non-B Hepatitis, was discovered in 1989 by group of collaborating scientists from Chiron and the Centres for Diseases Control.¹ The global seroprevalence of HCV among blood donors varies from 0.4-19.2 per cent.² The seroprevalence of HCV in voluntary blood donors in India is between 0.12-4 percent.³

Syphilis, a chronic systemic infection caused by *Treponema pallidum* sub species pallidum, is usually sexually transmitted and is characterized by episodes of active disease interrupted by periods of latency.⁴ Syphilis positivity varies from 0.8% in voluntary donors to more than 15% in paid commercial donors.⁵

This study aimed to determine the seroprevalence and trends of hepatitis C and syphilis in the last five years in a tertiary care hospital of North India.

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MATERIALS AND METHODS

A retrospective analysis of blood donors from January 2007 to December 2011 was conducted in blood bank in JN Medical College, AMU Aligarh. Donors were selected on the basis of history and examination proforma provided by WHO. Blood samples of these donors were screened for anti HCV by SD HCV ELISA 3.0 the 3rd Generation Anti-HCV ELISA test (Bio standard diagnostics private limited) and syphilis by CARBOGEN, RPR card test (Tulip diagnostics private limited) from 2007 to 2010 and in 2011 by SD BIOLINE syphilis (Bio standard diagnostics private limited) a solid phase immunochromatographic assay for the qualitative detection of antibodies of all isotypes (IgG, IgM, IgA) against *Treponema pallidum* antigen.

RESULTS

A total of 53950 healthy blood donors were tested, out of which 51266 (95.02%) were males and 2684 (4.98%) were females. The overall Seroprevalence of HCV and syphilis was 169 (0.31%) and 164 (0.30%) respectively (Table 1 & Table 2). There were 21(0.19%) cases of HCV in 2007, 27 (0.26%) in 2008, 35(0.36%) in 2009, 38(0.32%) in 2010 and 48 (0.42%) in 2011 showing increased prevalence from 2007 to 2011 (Table 1 & Fig. 1). No such increasing trend was seen in case of syphilis (Table 2 & Fig. 2) except in 2011 when

Table 1. Year- wise prevalence of HCV Positive cases

Year	No. of donors	No. of positive cases	Percentage	
2007	11084	21	0.19%	
2008	10020	27	0.26%	
2009	9650	35	0.36%	
2010	11840	38	0.32%	
2011	11356	48	0.42%	
TOTAL	53950	169	0.31%	

Table 2. Year- wise prevalence of Syphilis Positive cases

Year	No. of donors	No. of positive cases	Percentage
2007	11084	22	0.20%
2008	10020	19	0.18%
2009	9650	9	0.09%
2010	11840	4	0.03%
2011	11356	110	0.96%
TOTAL	53950	164	0.30%

Table 3. Comparison of various studies

Place	HCV	Syphilis	Authors
Nigeria	3.69%	-	Fasola <i>et al</i> ⁶
Trivandrum,Kerala	1.4%	0.2%	Mathai et al ⁷
Jodhpur,Rajasthan	0.28%	0.22%	Garg et al ⁸
Lucknow,U.P.	0.85%	0.01%	Chandra et ⁹ al
Andhra pradesh	0.84%	0.08%	Bhawani ¹⁰ et al
Present study	0.31%	0.30%	Rehman et al

J PURE APPL MICROBIO, 6(SPL. EDN.), OCTOBER 2012.



Fig. 1. Year-wise prevalence of HCV Positive



Fig. 2. Year- wise prevalence of Syphilis Positive

there was alarming increase in the no. of syphilis positive cases which was explained due to change in the kit used in 2011 which was a more sensitive kit (SD BIO LINE Syphilis).

DISCUSSION

Transfusion of blood and blood components is a life saving measure and helps a very large number of patients worldwide. At the same time, however, blood transfusion is an important mode of transmission of infection to the recipients which includes HIV, Hepatitis B, Hepatitis C, Syphilis, Malaria and various others. These infections are the cause of high mortality and morbidity in blood recipients. Therefore screening of donors for transfusion transmissible infections is crucial to ensure safety of blood supply.

At our centre the overall seroprevalence of Hepatitis C was 0.31% which was very similar to the study of Garg *et al* but lower than other studies (Table 3). There was increased seroprevalence from 2007 to 2011 (Table 2 and Fig. 2) in blood donors in JNMCH and this was probably due to lack of awareness about the routes of transmission of the sexually transmitted diseases.

The overall seroprevalence of the syphilis was 0.30% which was higher than other studies (Table 3). No such increasing trend was seen in case of syphilis (Table 2 & Fig. 2) except in 2011 when there was alarming increase in the number of syphilis positive cases which was explained due to change in the kit used in 2011 which was more sensitive kit (SD BIO LINE Syphilis).

Our study also showed that male donors are more common than female donors which were primarily due to increased deferral rate on account of wide prevalence of anemia.

CONCLUSION

Our study raises serious concerns regarding infection among blood donors especially HCV and Syphilis. Using a more sensitive testing kits will help identify false negative cases. Strict selection criteria for blood donors on the basis of history and examination and comprehensive screening of donors' blood using standard tests are highly recommended to ensure the safety of whole blood/component transfusion. Public awareness programs relating to routes of transmission for these infections should be encouraged.

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