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Original Article

Sero-prevalence of transfusion transmissible infections among blood donors in a tertiary care hospital

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ABSTRACT

This study is conducted to evaluate the seroprevalence of HBV, HCV, HIV and syphilis among blood donors in a tertiary care hospital of piparia, waghodia a five and half year experience. Total 10386 blood donors came to Dhiraj general hospital to donate blood during Jan2006-Aug2011 were selected for the study. Seroprevalence of HBV, HCV and HIV was studied by ELISA in voluntary and replacement blood donors. RPR was done for screening of syphilis. The seroprevalence of HIV, HBV, HCV and syphilis is found to be 0.25%, 1.35%, 0.16% and 0.9% respectively. Infections are slightly more common among replacement donors compared to voluntary donors. There is a gradual decrease of TTIs in blood donors over the years due to following of stringent blood donor selection criteria.

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1. Introduction

Timely transfusion of blood saves millions of lives, but unsafe transfusion practices puts millions of people at risk of transfusion transmissible infections (TTIs) [1]. An unsafe blood transfusion is very costly from both human and economic points of view. Morbidity and mortality resulting from the transfusion of infected blood have far-reaching consequences, not only for the recipients themselves, but also for their families, their communities and the wider society [2,3]. Since a person can transmit an infection during its asymptomatic phase, transfusions can contribute to an ever-widening pool of infection in the population. The economic costs of the failure to control the transmission of infection include increased requirement for medical care, higher levels of dependency and the loss of productive labour force, placing heavy burdens on already overstretched health and social services and on the national economy [2,4].

Only continuous improvement and implementation of donor selection, sensitive screening tests, and effective inactivation procedures can ensure the elimination, or at least reduction, of the

risk of acquiring TTIs [5]. TTIs can exist as asymptomatic diseases in the hosts, so donors must be screened for high-risk behaviour related diseases. Evaluation of data on the prevalence of transfusion transmissible infections namely HIV, HBV, HCV and syphilis among blood and plasma donors permits an assessment of the occurrence of infections in the blood donor population and consequently the safety of the collected donations. It also gives an idea of the prevalence of the transfusion transmitted infections (TTIs), among blood donors allows for assessment of epidemiology of these infections in the community. Globally, more than 81 million units of blood are donated each year [6]. More than 18 million units of blood are not screened for transfusion-transmissible infections [7].

2. Material and Method

Present study was carried out at Blood Bank of DHIRAJ GENERAL Hospital, SBKS MI & RC, PIPARIA, BARODA. A routine screening of every unit of blood to exclude HIV, HBV, HCV AND SYPHILIS was done over a period of 5 1/2 years, from Jan 2006 to aug 2011. In this duration, total of 10386 units of blood was collected from donors (voluntary & replacement). Donors were selected by taking history, clinical examination and following strict donor's selection criteria to eliminate professional donors, donors who gave voluntary written consent to participate in this study. A detailed pre-donation questionnaire was included in donor registration form. Information regarding risk factors like

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H/O surgery, hospitalization, blood transfusion, occupation, high risk behavior and tattoo marks was collected. All the samples were screened for HIV, HBV, HCV and SYPHILIS. hepatitis B surface antigen (HBsAg; ELISA 3rd generation), HIV (1 and 2; ELISA 3rd generation), hepatitis C virus (HCV; ELISA 3rd generation) 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 labeling them sero-positive and respective blood units were discarded.

Table 1 : Yearly Distribution Data

| Year | Voluntary Donor | | | Replacement Donor | | | Total |
|-----------------|-----------------|------|-------|-------------------|------|-------|-------|
| | REP D | VOLD | TOTAL | REP D | VOLD | TOTAL | |
| 2006 | 110 | 36 | 146 | 952 | 18 | 970 | 1116 |
| 2007 | 115 | 3 | 118 | 1637 | 6 | 1643 | 1761 |
| 2008 | 150 | 9 | 159 | 2214 | 3 | 2217 | 2376 |
| 2009 | 225 | 1 | 226 | 1340 | 0 | 1340 | 1566 |
| 2010 | 512 | 8 | 520 | 1432 | 4 | 1436 | 1956 |
| 2011 JAN TO AUG | 390 | 5 | 395 | 1213 | 3 | 1216 | 1611 |
| TOTAL | 1502 | 62 | 1564 | 8788 | 34 | 8822 | 10386 |

TABLE 2 : Comparison Between Prevalance Of HBV , SYPHILIS , HCV & HIV

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 JAN TO AUG |
|----------|-------|-------|-------|-------|-------|-----------------|
| HBV | 0.99% | 1.53% | 1.17% | 1.27% | 1.43% | 1.61% |
| SYPHILIS | 0.44% | 1.36% | 1.47% | 0.57% | 0.51% | 0.49% |
| HCV | 0.36% | 0.23% | 0.13% | 0.06% | 0.20% | 0.06% |
| HIV | 0.27% | 0.28% | 0.13% | 0.45% | 0.26% | 0.19% |

TABLE 3 : DISTRIBUTION OF SERO-POSITIVE CASES

| INFECTIONS | REP D | VOLD | TOTAL | MALE | FEMALE |
|------------|-------|------|-------|------|--------|
| HIV | 26 | 0 | 26 | 26 | 0 |
| HBV | 126 | 14 | 140 | 138 | 2 |
| HCV | 16 | 1 | 17 | 17 | 0 |
| RPR | 80 | 11 | 91 | 90 | 0 |
| TOTAL | 248 | 26 | 274 | 272 | 2 |

TABLE 4 : Comparison of various studies

| Place | HIV | HBV | HCV | Syphilis | Author and Year |
|---------------|-------|-------|-------|----------|------------------------------------|
| Ludhiana | 0.08% | 0.66% | 1.09% | 0.85% | Gupta N et al (2001-2003)(11) |
| BHANPUR, M.P. | 0.51% | 2.90% | 0.57% | 0.23% | Nilima sawke et al (2006-2008 (12) |
| Vikarabad, AP | 0.39% | 1.41% | 0.84% | 0.08% | Bhawani et al (2004-2009)(13) |
| Etawah, UP | 0.19% | 2.63% | 0.34% | Not done | Dayal S. 2006-jun 2011(14) |
| Lucknow, U.P. | 0.23% | 1.96% | 0.85% | 0.01% | Chadra et al 2001-2006 (15) |
| Present study | 0.25% | 1.35% | 0.16% | 0.90% | DGH, PI 2004-AUG 2011 PIARIA |

Vol = voluntary; Rep = replacement

In our study, HCV and SYPHILIS prevalence among donors shows a downward trend over the period of 51/2 years. The HIV prevalence of 0.25% over a period of six years is not much high compared to other Indian studies. The prevalence of HBV is in accordance or slightly higher than the other Indian studies. The prevalence of HCV is in accordance with other studies where as HCV prevalence among hospital-based population was found to be lower 0.16% compared to others. In the present study, prevalence of syphilis was found to be which was higher of 0.9% compared to other studies.

5. Conclusion

In conclusion, we found >2 TTIs in both voluntary and replacement donors. This emphasizes the need for highly sensitive donor screening techniques to enable the detection of TTIs. These pose a definite risk to the recipient of the blood. Due to a similarity in risk factors and routes of transmission, public awareness and education would go a long way in curbing the prevalence of these infections and increasing blood safety. In the West, the practice of donor self-exclusion helps in the deferral of high risk donors. However, due to low socioeconomic status and lack of awareness, the implementation of donor self-exclusion is difficult in India.

Voluntary donations are safer as compared to replacement ones and should be encouraged. Efforts should be made to increase the number of voluntary donors and reduce replacement donations to a minimum.

Professional blood donors were discouraged in our study as they were unsafe. Voluntary donors were found to be safer compared to replacement donors. Low level of test positivity reported in this study is due to better coordination between blood bank and user department, giving ample time for procuring blood. Motivation and recruitment of potential local blood donor population would lead to an effective voluntary system.

Transmission of TTIs during serologically negative window period still poses a threat to blood donor safety. Therefore strict selection of blood donors and comprehensive screening of donor's blood using standard methods are highly recommended to ensure the safety of blood for recipient.

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