

Serological study of transfusion transmitted diseases

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Abstract

Transfusion of blood and blood products is an excellent mechanism for disease transmission. Causative agents are many and include malaria, syphilis, Human immuno-deficiency virus (HIV), Hepatitis B and C. The present study was aimed at documenting the prevalence of serologically positive donors for the above diseases, to ascertain their co-sero-positivity and their year wise trend in a rural population. Results suggest that sero-positivity increased gradually from 1998 to 2003 following which there has been a decline. This study also demonstrates that sero-positivity is higher in the rural population studied than in other corresponding studies.

Key Words: *Transfusion diseases, HIV, HBsAg (Hepatitis B virus surface antigen), VDRL (Venereal Diseases Research Laboratory), HCV (Hepatitis C virus).*

Introduction

Transfusion of blood when carried out judiciously and under clear indications is life saving but at the same time it carries with it the risk of transmission of infection. The agents responsible for transfusion transmitted diseases (TTD) share in common, a prolonged asymptomatic incubation period and stability of survival in the stored blood. The causative agents are many and include malaria parasite, salmonella, brucella, toxoplasma, trypanosoma, Human immuno-deficiency virus (HIV), cytomegalovirus, Epstein Barr virus, Hepatitis virus B, C etc. The prevalence of sero-positivity is gradually increasing due to increased incidence of these disease causing organisms as well as availability of screening tests of increased sensitivity and specificity. The risk of infection transmission in the "window period" cannot be overemphasized and therefore there is need for introducing screening test for detection of antigens in this period.

Aims and objectives

1. To determine the prevalence of sero-positive blood donors for syphilis, hepatitis B, Hepatitis C and Hepatitis C in the blood bank of a teaching hospital located in a rural area.

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2. To ascertain year-wise trend of sero-positivity in a rural population.
3. To chart the prevalence of co-sero-positivity of syphilis, HbsAg, HCV, and HIV among blood donors to ascertain multiple infections.

Material and Methods

The study was carried out between the period: Jan 1998 to July 2005. All voluntary donors attending the blood bank were screened. Five milliliters of blood was collected in a plain sterile pilot bottle, centrifuged and the serum extracted was subjected to the following tests:

1. Screening for syphilis by RPR card test.
2. HbsAg by ELISA
3. Hepatitis C antibody by ELISA.

The reagents used were commercially available FDA approved test kits.

Observations

The total numbers of donors studied were 12274, of which 528(4.3%) were seropositive. The majority of donors (12078) were males (98.4 %). The highest incidence of seropositivity was found in the age group 26-32 years.

Table I : Year wise trend of sero-positivity

| Year | Total Screened | Total sero-positive | Incidence |
|---------------------|----------------|---------------------|-----------|
| Jan1998-Dee 1999 | 3658 | 140 | 3.82 % |
| Jan 2000-Dee 2001 | 3301 | 159 | 4.81 % |
| Jan 2002 -Dee 2003 | 3462 | 189 | 0.85 % |
| Jan 2004 - Ju l2005 | 1853 | 40 | 0.86 % |

Table II

| | | |
|----------------------------------|---|-------------|
| Total number of donors tested | : | 12214 |
| Total nos. of seropositive cases | : | 528 (4.3%) |
| Anti-HTV1 and 2 positive cases | : | 313(2.55%) |
| Anti-HCV positive cases | : | 6 (0.05%) |
| VDRL positive cases | : | 105 (0.86%) |

Table III

| Co-Seropositivity Rate | | |
|------------------------|---|--------|
| 1. HBsAg | : | 0.57% |
| 2. AntiHIV + HBsAg | : | 0.76 % |
| 3. AntiffIV + VDRL | : | 1.33% |
| 4. Anti HCV + VDRL | : | Nil |

Summary

Out of a total of 12274 voluntary blood donors screened, 528(4.3%) were seropositive and the seropositivity for different antigens / antibodies was as follows:

| | | |
|-------------|---|-------|
| 1. HBsAg | : | 2.55% |
| 2. Anti HIV | : | 0.85% |
| 3. Anti HCV | : | 0.05% |
| 4. VDRL | : | 0.86% |

Overall prevalence of seropositivity for more than one test was highest for Anti HTV + VDRL (1.33 %).

Discussion

In the present study, 12274 voluntary blood donors were screened for Anti HIV, Anti HCV, HBsAg and VDRL. Of these 1207 (98.4 %) were males. This could be due to females, particularly in a rural setting, having a lower social status, are relatively more illiterate and therefore lack awareness and initiative. They are also subject to rejection on the basis of malnutrition, inadequate body weight and

low hemoglobin levels. The highest incidence of seropositivity was in the younger age group (26-32 years). The significance of this association is uncertain as most voluntary donors attending our blood bank belonged to a younger age group.

The sero-positivity rate in our study is 4.3% which is higher than other studies.^[4,5] This increased incidence in a rural population may be attributed to the following causes:

1. Illiteracy, low socio-economic status and lack of awareness regarding preventive measures.
2. Tattooing, ear and nose piercing under unhygienic conditions being more prevalent in rural areas.

The finding of co-seropositivity of anti-HIV positive donors with HBS, VDRL positivity is consistent with past epidemiological studies.^[23]

Sexually transmitted diseases like syphilis facilitate both acquisition and transmission of HIV and HBsAg. Preexisting HIV infection can lead to HBsAg carrier state.

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