

Seroprevalence of HIV among Blood Donors Attending Blood Bank in a Tertiary Care Teaching Hospital –Andhra Pradesh

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Abstract: Introduction: Human immunodeficiency virus is a RNA virus which causes Acquired immunodeficiency syndrome (AIDS) is a major global health problem, transmitted sexually, perinatal, intravenous drug abusers and blood transfusion. Transfusion associated HIV is one of the major transfusion transmitted infection (TTI) in India.

Material and Method: This study was carried out in a tertiary care teaching hospital. This is a retrospective analysis of donor profiles for a period of nine years from January 2010 to December 2018 to assess the distribution of Seroreactive cases.

Results: A total of 63695 blood donors were screened amongst which 125 (0.19%) were reactive for HIV. Replacement donors showed more seroreactive compared to voluntary donors. Seroreactive is common in young donors.

Conclusion: In present study, there is gradual decline in prevalence of HIV from 2010 to 2018 except in 2014, which can be attributed to effective pre-donation counseling of donors, encouragement of voluntary donors and increased awareness in society etc. Health education to high risk groups and advanced techniques of screening ensures better blood transfusion services.

Key Words: Donors, ELISA, HIV, Replacement donors, Voluntary donors

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I. Introduction

Transfusion medicine has been developed in the second half of the last century. After the starting of the blood transfusion in the early 1940s, various transfusion associated problems have been noticed. Transfusion transmitted infections (TTI) was first noticed in 1940s. According to the United Nations Joint Program on HIV/AIDS (UNAIDS), at the end of 2010, an estimated 34 million people with AIDS living within the world (1). The highest number of HIV patients (22.9 million) is reported from sub-Saharan Africa (31.6 – 35.2 million) (2). India harbors the third largest number of HIV infected individuals in the world (3). Several States in India have reported the presence of HIV-2 after the first case was reported from Mumbai in 1991 (4).

The National AIDS Control Organization (NACO) projected that HIV seroprevalence would increase from 7/1000 in 1995 to 21.2/1000 in 1997. A high incidence (8.2/1000) of HIV was observed among blood donors (5). This study was carried out to find out the true HIV reactivity among the blood donors in and around Tirupati. A total of 63695 voluntary and replacement blood donors who visited the Model Blood Bank SVRR Govt. General Hospital, Tirupati were followed for 9 years which is from 2010 to 2018 to determine the true HIV seroprevalence by screening with ELISA kit (WHO approved) among which 125 (0.19%) donors were reactive at stage I and stage II.

II. Material and Method

This is a retrospective study conducted for a period of nine years from January 2010 to December 2018 at Model Blood Bank, S.V.R.R. Government General Hospital, Tirupati, which unfolds the impact of seroprevalence of HIV in blood transfusion services. A total number of 63695 voluntary and replacement donors were included in this study. Only the healthy donors between age group of 18 -60 years were selected after careful examination by using personal questionnaire including general health related inquiry and any specific history, physical examination – body weight; temperature; clinical examination – general examination, pulse and blood pressure and Hemoglobin estimation. The questionnaire was also included with past history of illness to be notified and TTI related etiological affiliation if any. Donors who did not fulfil the criteria for blood donation, paid and commercial donors and those with a history of high risk behavior were excluded. Consent for

infectious marker testing was obtained from all donors at the time of pre-test counselling prior to blood donation.

Five ml of blood in EDTA vacutainer was collected from the blood donor which will be subjected for screening of HIV and other TTI by using enzyme linked immunosorbent assay (ELISA) third generation kit - Erba Lisa HIV Gen3, Transasia Bio-Medicals Ltd , with reported sensitivity of 100% and specificity of 99.34% as per the manual / pack insert supplied by the manufacturer. The blood samples tested reactive by ELISA (Stage 1) were repeat tested in duplicate using the same ELISA (Stage II) kit and using the same sample obtained from the donors. Blood units which showed reactive results in both the tests were considered to be true reactive only were included in this study. There were as such, no contradictory results.

III. Results

A total of 63695 donors were screened for the presence of HIV over a period of 9 years. Of these 30055 (47%) were voluntary donors and 33640 (53%) were replacement donors. Tab No:1. Among 63695 donors, 125 (1.96% for 1000) were found initially reactive for HIV. All are upon repeat testing in duplicate all 125 donors were found to be reactive with seroprevalance of 0.19%.

This study suggests that the true HIV Seroreactive among blood donors in and around Tirupati is significantly lower than the data provided (82/1000) by NACO (5). In present study, of the 125 reactive cases 82 (65.6%) were replacement donors and 43 (34.4%) were voluntary donors. Tab. No:1. This depicts more HIV seroreactivity among replacement donors compared to voluntary donors.

The study revealed that most of the HIV reactive cases were among donors between 20 - 40 years of age accounting to 121(96.8%) cases which might be due to more donors belonging to this age group and the least were found in less than 50 years of age – 4 (3.2%) cases. The trend in seroprevalance decreased when compared with past years except 2014 during this year's 24 cases were found seropositive .The year wise trend and replacement versus voluntary donor distribution of HIV reactive cases are tabulated in Table No: 1.

Table No 1: Year wise trend and Replacement versus Voluntary Donor Distribution of HIV reactive Cases.

Year	Total No of units collected	Total no of units collected from Replacement donors	No of HIV cases among Replacement donors	Total no of units collected from Voluntary donors	No of HIV cases among Voluntary Donors	Total HIV +VE	Total HIV +VE %
2010	5236	3527	16	1709	2	18	0.34%
2011	6296	3662	16	2634	5	21	0.33%
2012	7238	4132	12	3106	4	16	0.22%
2013	6810	3472	06	3338	8	14	0.20%
2014	7220	3420	16	3800	8	24	0.33%
2015	7942	3860	04	4082	3	07	0.08%
2016	7704	3795	06	3909	3	09	0.11%
2017	6925	3560	02	3365	3	05	0.07%
2018	8324	4212	04	4112	7	11	0.13%
Total	63695	33640	82	30055	43	125	-

IV. Discussion

Blood transfusion is considered as a potential risk factor for transmission of HIV which is considered also to be life-threatening and has a global public health importance.

The first documented HIV infection in India was among a cohort of sex workers in the southern State of Tamil Nadu, in 1986,(6). The virus since then has been spreading rapidly across the country. States with a high prevalence of HIV include Maharashtra, Tamil Nadu, Karnataka, Andhra Pradesh, Manipur, and Nagaland(7). Within these high-prevalence areas, the HIV epidemic reflects the diverse social, cultural, religious, and sexual practices(8). There are “hot spots,” where commercial sex work is common, such as in coastal Andhra Pradesh, northern Karnataka, and southern Maharashtra(1). There was an estimated 5.21 million HIV infected persons at the end of 2004 (NACO annual Report 2004)(9) . In 2005 it was estimated by the WHO that 38 million people were living with HIV worldwide, 4.1 million were newly infected and 2.8 million had died of AIDS(10).

Epidemiology of HIV-2 is much varied. Ever since its first occurrence from Senegal, West Africa in 1986(11), many cases of HIV-2 have been reported from various parts of the world especially in the West African countries(1). Several reports of HIV-2 infection have been received from Portugal, Mozambique, Angola, South-Western India and Brazil(1). In our study, we did not find any HIV-2 seropositive donors. The prevalence of HIV reported in Indian blood donors ranges from 0.084-3.87%(12). A study conducted on blood donors at a tertiary care centre of the Armed forces revealed seropositivity rates of 0.12 per cent in 2003, 0.17 per cent in 2004 and 0.10 in 2005, with an overall seropositivity of 0.13%(12). In our study it is 0.19%.

A decreasing trend in HIV seroprevalence among blood donors was reported from Kathmandu, Nepal (13) and West African country, Mali(13). The prevalence of HIV is lower when compared with previous studies done in Ethiopia: Bahirdar, NorthWest Ethiopia and Jimma, Ethiopia(13). It is also lower than studies done in African countries.(14).

Prevalence of HIV among blood donors in India in 2013 was 0.27% (NACO Report 2013)(9). Implementation of chemiluminescence and Nucleic acid test (NAT) assay in recent years has significantly reduced the prevalence of HIV in India(15) by reducing the time for effective detection to 11- 15 and 5- 11 days respectively.

V. Conclusion

The analysis of trends in HIV seroprevalence among replacement and voluntary blood donors through the year 2010-2018 showed a decreasing trend except 2014. There is still need for effective donor education and quality donor selection protocol frame work by qualified personnel. The risk of TTI can be minimized further by adapting newer strategies – Nucleic Acid Test (NAT).

Therefore, predonation counseling, donor self exclusion, 100% voluntary donation and technical advancements in screening of blood units act as pillars of foundation in safe blood transfusion practices.

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