

## ORIGINAL ARTICLE

### ASSESSMENT OF SEROPREVALANCE OF HUMAN IMMUNODEFICIENCY VIRUS INFECTION AMONG BLOOD DONORS IN AND AROUND BELLARY, KARNATAKA STATE, INDIA

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**ABSTRACT: AIMS AND OBJECTIVES:** The aim of the study was to analyse the seroprevalence of human immunodeficiency virus (HIV) infection in the blood among healthy voluntary blood donors in and around Bellary. **SAMPLE SIZE:** 51,144 blood donors. **STUDY DESIGN:** Retrospective study. **DURATION OF THE STUDY:** Jan-2006 to Dec-2013. **RESULTS:** In the 8-year study period, 51,144 units of blood were collected. The Seroprevalence of HIV was found to be 0.38%. Also, the Seroprevalence of HIV in Voluntary Blood Donors and Replacement Blood Donors was found to be 0.35% and 0.81%. In males and female blood donors, the Seroprevalence was found to be 0.38% and 0.39%. **CONCLUSION:** The 8 year study reveals that the Seroprevalence of HIV in replacement donors is nearly twice as that of voluntary donors and nearly equal in male and female donors. Screening the blood donors for IV infection has to be made mandatory and the tests should be of the highest quality. Education and awareness among people should be encouraged and imparted.

**KEYWORDS:** Human Immune-deficiency Virus (HIV), Seroprevalence, Voluntary Blood Donor, Replacement Blood Donor.

**INTRODUCTION:** Blood transfusion is a core service within health care systems and individuals who donate their blood provide a unique contribution to the health and survival of others. Every country faces an on-going challenge to collect sufficient blood from safe donors to meet national requirements.

The donation of blood by voluntary non-remunerated blood donors is recognized as being crucial for the safety and sustainability of national blood supplies. Systems based on replacement donation by the family and friends of patients requiring transfusion are rarely able to meet clinical demands for blood while paid "donation" poses serious threats to the health and safety of the recipients as well as the donors themselves.

The year 1981 can be considered a milestone in the chronicles of medical science, especially infectious diseases. A new cluster of cases, previously hitherto unrecognized and unnoticed emerged in the economic superpower United States of America. Symptoms of Pneumocystis Carinii Pneumonia (PCP) and later a rare type of skin cancer Kaposi Sarcoma was reported in a group of homosexual men.

The Centres for Disease Control and Prevention (CDC) was alerted and immediately a task force was formed to monitor the cases. The misleading term GRID (Gay-Related Immune Deficiency) was used to refer to these new clusters of cases. Around July-September the CDC had coined a new

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word, a word that would slowly and gradually strike terror in the hearts of the innocent and guilty alike, a word that would shatter millions of hopes and households-AIDS.

And the causative agent a lentivirus (slowly replicating retrovirus) called Human Immunodeficiency Virus (HIV). As the knowledge about the disease was unravelled steadily, several misconceptions were destroyed and a new arsenal of information was obtained to counter this deadly infection. Sexual transmission, vertical transmission, blood transfusion, percutaneous injection using shared needles in drug abusers were discovered to be the major routes of transmission.

Blood transfusion- A novel practice of transferring blood was immediately and rightfully hailed as the savior of the weak and diseased. However, as the old adage goes "There is no free lunch in this world"; it was accompanied by its share of troubles. HIV transmitted through blood transfusions became a global health challenge and was recognized to be the most threatening obstacle which could derail the blood transfusion technique and with it crash the entire health set-up. The need to address this problem was thus intensified.

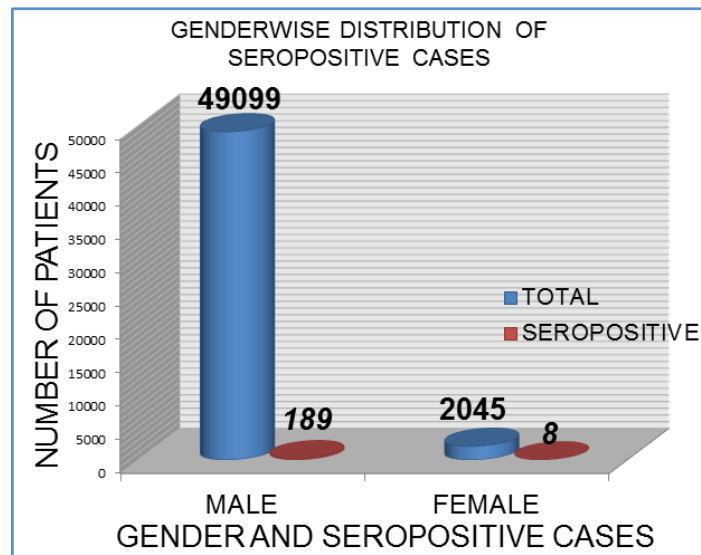
This study here is conducted with an objective to determine the prevalence of HIV infections among blood donors in and around Bellary, Karnataka. The statistics and the data obtained can be further extrapolated to be compared with the global scenario and impart knowledge about the disease and its burden.

**MATERIALS AND METHODS:** A retrospective hospital record based study was conducted at the blood bank of tertiary care teaching hospital Bellary during the period Jan-2006 to Dec-2013. The inclusion criteria were: Hb > 12gm/dl for both sexes, weight of > 50 kg, no history of chronic illness/ hepatitis/ high risk behavior. A total of 51,144 units of blood were collected during this period and screened for HIV by using approved ELISA kits. All the blood samples were sent to national AIDS control organisation (NACO) and subjected to NAT test (nucleic acid amplification) for detection of antigens. All the positive samples were retested before labeling them as seropositive and discarded. Medical reports of donors were accessed from the hospital records and analysed.

**RESULTS:** A total of 51,144 units of blood collected from donors coming to blood bank, VIMS medical college hospital Bellary and from blood donation camps conducted in various places around Bellary. Of those, 49,099 (96.00%) were male and 2045 (3.99%) were females.

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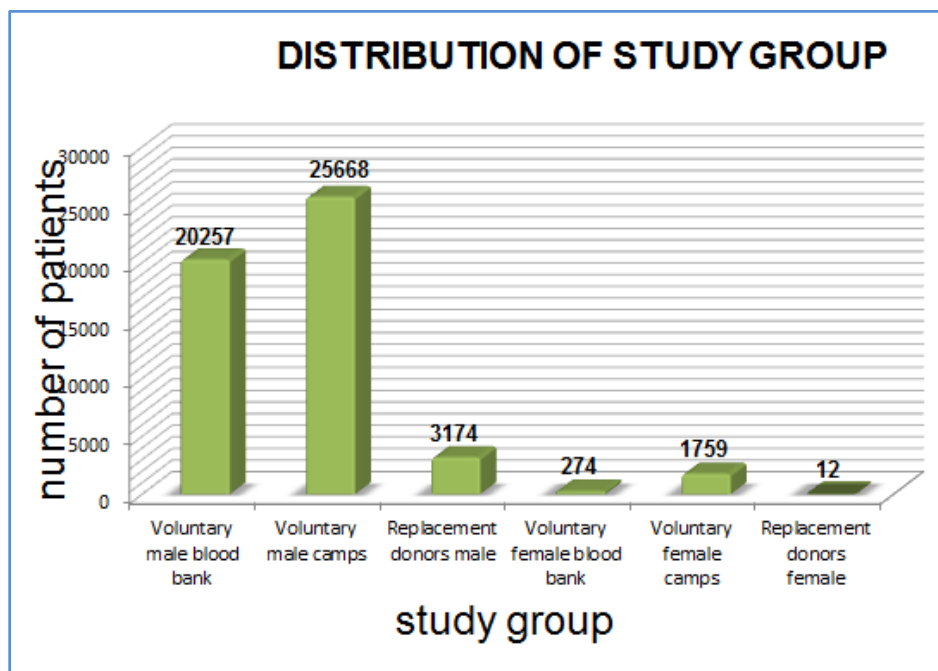
**GRAPH-1:** GENDERWISE DISTRIBUTION OF THE STUDY GROUP AND GENDERWISE PREVALENCE OF HIV SEROPOSITIVITY.



**GRAPH 1**

The study populations are divided into various groups depending on the mode of blood donation (GRAPH-2). Year-wise collection of the blood among these study groups are given in TABLE-1.

**GRAPH-2:** DISTRIBUTION OF SAMPLES AMONG DIFFERENT CATEGORIES IN THE STUDY.



**GRAPH 2**

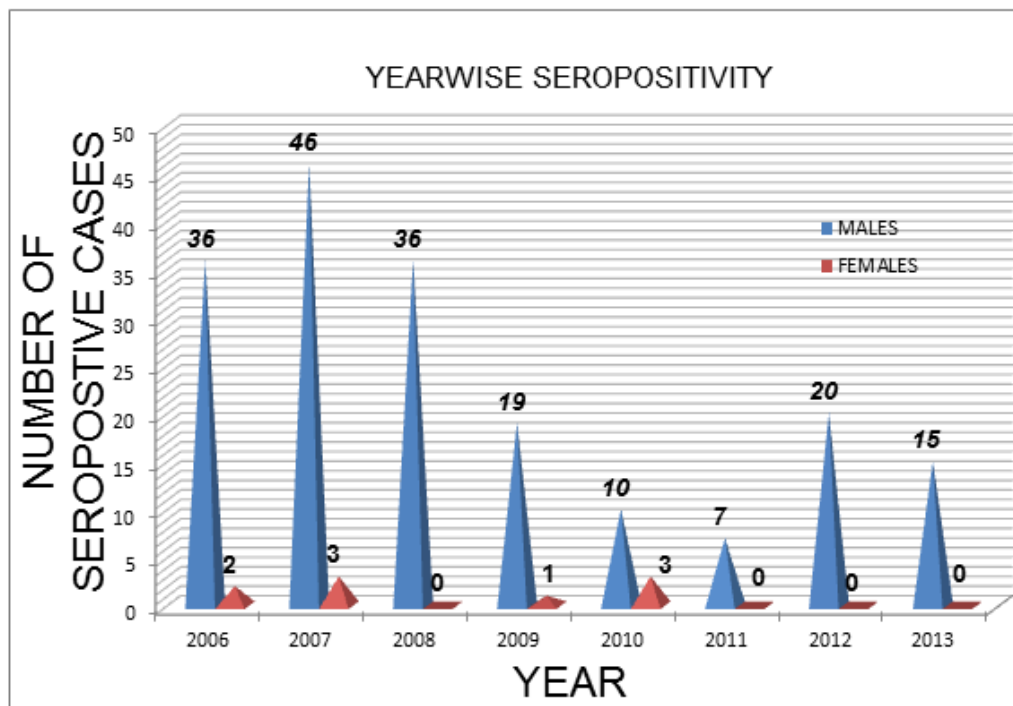
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YEAR	MALE			FEMALE			TOTAL
	Voluntary male blood bank	Voluntary male camps	Replacement donors	Voluntary female blood bank	Voluntary female camps	Replacement donors	
2006	1900	2000	133	35	165	0	4233
2007	2064	2765	266	50	200	0	5345
2008	1779	3305	344	36	364	0	5828
2009	1998	3199	350	67	300	0	5914
2010	1410	4000	300	75	300	0	6085
2011	3003	2244	1371	2	86	12	6718
2012	4547	3298	0	5	119	0	7969
2013	3556	4857	410	4	225	0	9052
	20257	25668	3174	274	1759	12	51144

**TABLE 1: YEAR-WISE COLLECTION OF THE BLOOD AMONG THESE STUDY GROUPS**

The blood units collected were subjected to the screening of HIV infection the prevalence of HIV was found to be 0.38% (TABLE-2).

**GRAPH-3: YEARWISE DISTRIBUTION OF HIV SEROPOSITIVE CASES.**



**GRAPH 3**

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YEAR	MALE		FEMALE		TOTAL
	Voluntary donors	Replacement donors	Voluntary donors	Replacement donors	
2006	32	4	2	0	38
2007	40	6	3	0	49
2008	28	8	0	0	36
2009	19	0	1	0	20
2010	8	2	2	0	12
2011	3	4	0	0	07
2012	19	1	0	0	20
2013	14	1	0	0	15
<b>TOTAL</b>	<b>163</b>	<b>26</b>	<b>8</b>	<b>0</b>	<b>197(0.38%)</b>

**TABLE 2: YEAR-WISE SEROPOSITIVITY OF THE BLOOD AMONG THESE STUDY GROUPS**

The prevalence of HIV in voluntary and replacement donors was 0.35% and 0.81% respectively. Also, the prevalence in males and females was found to be 0.38% and 0.39% respectively.

**DISCUSSION:** Blood transfusion is an integral and lifesaving procedure of modern medicine. However with it, the risk of transmitting certain transfusion transmissible infections like HIV, HBV, HCV, syphilis and malaria have been like a lurking shadow.

The HIV/AIDS pandemic focused the world's attention on blood transfusion as a significant route of transmission of HIV/AIDS. It is estimated that blood transfusion accounted for 5-10% of HIV infections in the 1980s and it still contributes to a significant proportion of new infections, particularly in high prevalence countries.

The risk of HIV infection through unsafe blood and blood products is exceptionally high (95–100%) compared to other common routes of HIV exposure: for example, 11–32% for mother-to-child transmission and 0.1%–10% for sexual contact.

In developing countries, pregnant women and children account for a disproportionate number of HIV and hepatitis viral infections through unsafe blood and blood products because they are the main groups of patients requiring transfusion. Preventing the transmission of infection through unsafe transfusion is one of the core strategies for HIV/AIDS prevention – and is, in fact, the only approach to HIV prevention that is almost 100% effective.

In most developed countries, the risk of HIV transmission is very low because of the adoption of an integrated approach based on voluntary blood donation, stringent donor selection procedures, the screening of all donated blood for transfusion-transmissible infections and the use of transfusion only when no suitable alternative are available. However, varying degrees of risk remain in many parts of the world. The transmission of hepatitis and other blood borne infections is equally preventable.

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The prevalence of infectious markers among donated blood units is not only an indicator of the relative risk of transfusion-transmitted infection, but also directly affects the actual availability of blood.

Currently safety of blood transfusion is ensured by careful selection of donors and mandatory screening for HIV infection. Despite these measures, occasional transmission of HIV via blood transfusion has been reported. This can occur due to the window period. However, use of nucleic acid tests that can detect the infection as early as 72 hours within exposure to infection is to be encouraged.

In the present study, prevalence of HIV seropositivity was 0.38%. The seropositivity of HIV infection in other studies were, 0%,<sup>[1]</sup> 0.1%,<sup>[2]</sup> 0.3%,<sup>[3]</sup> 0.9%.<sup>[4]</sup> The prevalence of HIV seropositivity among voluntary blood donors was 0.35% and replacement blood donors was 0.81%. Higher prevalence of HIV among replacement donors has been documented in various other studies.<sup>[5], [6], [7]</sup> Karnataka AIDS prevention society also gives data of prevalence of 0.5%.

These results are a reflection of the problem of unnoticeable infections in healthy looking members of the general population. Educating people, creating awareness and encouraging voluntary blood donation through various camps by various organizations and implementing strict donor selection criteria as per standard guidelines and thorough screening of collected blood by most sensitive and specific tests can reduce the risk. However, as a long-term strategy, continued monitoring and updating with the recent innovations and duly following the norms and regulations will play a major role in the management of this global health challenge.

**CONCLUSION:** In the 8-year study period, 51,144 units of blood were collected. The Seroprevalence of HIV was found to be 0.38%. Also, the Seroprevalence was 0.35% and 0.81% in voluntary blood donors and replacement blood donors respectively.

The seropositive patients were counselled advised and motivated to accept necessary certain tests and treatment.

This study vehemently encourages voluntary blood donation camps and to set up camps for this very purpose. Educating people and spreading awareness regarding HIV infections will have to be the mainstay for this project. The use of nucleic acid amplification tests for the screening of blood has to be advised and promoted. It is absolutely necessary to avoid the transmission of infection from repeat donors.

It is high time the risk of HIV infection associated with blood transfusion be dealt firmly, tackled strategically and solved systematically. Blood transfusion is too valuable a procedure to be neglected. And HIV is too major a problem to be casually treated. Millions of lives are at stake. Thus the findings of this study as well as certain advices should be seriously considered to promote the health development- a right of all citizens.

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