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Research Article

SEROPREVALANCE OF TRANSFUSION TRANSMISSIBLE INFECTIONS AMONG HEALTHY VOLUNTARY BLOOD DONORS IN AND AROUND BELLARY, KARNATAKA STATE, INDIA

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ABSTRACT

The aim of the study was to analyse the Seroprevalence of HIV, HBV, HCV and syphilitic infections in the blood among replacement and voluntary blood donors in and around Bellary and to statistically assess the level of blood safety. It is also an indirect evidence of disease burden in the community. A total of 23,739 units of blood collected from donors coming to blood bank, Vijayanagar Institute of Medical Sciences Hospital and College, Bellary and from blood donation camps conducted at various places in and around Bellary. This isa retrospective hospital record based study for which an inclusion criterion was set up and strictly adhered. The duration of the study was from Jan-2011 to Dec-2013. In the 3-year study period, 23,739 units of blood were collected. The Seroprevalence of HIV, HBV, and HCV was found to be 0.17%, 2.68% and 0.037% respectively. Also, the Seroprevalence of HIV and HBV was significantly higher for replacement donors than voluntary blood donors. The 3 year study reveals that among the transfusion transmissible infections, the prevalence of HBV is found to be more when compared to HIV, HCV and syphilis. No blood donor was found to be positive for syphilis. The prevalence of HBV, HIV is more in replacement donors as compared to voluntary donors. Education and awareness among people should be encouraged and imparted.

Keywords: *Transfusion Transmissible Infections, Seroprevalence, Blood Donor, Human Immuno-deficiency Virus (HIV), HbsAg, HCV, Syphilis*

INTRODUCTION

Though man is well known as ‘‘crown of god’s creature” he is often acknowledged as “an alien in the world of microbes” for the clear fact that microorganisms were the archetype of all forms of life on planet earth. Inspite of being a million times smaller in size as compared to man, they are more powerful than man and capability to wipe out his strength and defeat him by waging wars known as infectious disease. In the current global trend of non-infectious diseases, equal emphasis has been paid to such infectious diseases which are powerful enough to take away lives of many people and are rapidly spreading across the globe. The routes of spread of such infections have been attributed to change in life styles and behaviour of man and as a result, many innocent lives have been fallen in debt of such catastrophe. Blood Transfusion has been and will continue to be one of the most important life-saving procedures in the history of medicine and it stands out as one of such major a route that facilitates transmission of few deadly infections which are popularly known as TTIs. They are mainly, HIV, HBV, HCV, syphilis. Great attention has been paid to this route of spread because if neglected, transfusion may serve as easy and rapid pathway of spread of these infections. Also realizing the fact that this type of spread can easily prevented by simple screening procedures, it has assumed greatest importance in the control of spread of such infections.

As the old adage goes ‘Nip it in the bud’ this problem needs to be addressed immediately.

By conducting this study, I would like to present to the world, an estimate of seroprevalence of TTI in and around district of Bellary which would in turn help in a broad scale to project the prevalence of such infection amongst the general public.

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-2011 to dec-2013. The inclusion criteria were, Hb> 12gm/dl for both sex, weight of > 50 kg, no history of chronic illness/ hepatitis/ high risk behaviour. A total of 23,739 units of blood were collected during this period and screened for HIV, HBV, HCV, 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. The test for syphilis was done by VDRL. All the positive samples were retested before labelling them as seropositive and discarded. Medical reports of donors were accessed from the hospital records and analysed.

RESULTS

A total of 23,739 units of blood collected from donors coming to blood bank, VIMS medical college and hospital, Bellary and from blood donation camps conducted in various places around Bellary. Of those, 23,286 (98.09%) were male and 453 (1.91%) were females. Various groups of the study population used in this study is shown in table-1. The blood units collected were subjected to the screening of various TTIs. The prevalence of HIV, HBV and HCV were 0.17%, 2.47%, and 0.03% respectively. Yearly distribution of Seroprevalence is given in table-2. The prevalence of HIV in voluntary and replacement donors was 0.16% and 0.33% respectively. HBV was 2.60% and 3.68% respectively. The prevalence of TTIs in various subgroups are shone in table-3.

Table 1: Distribution of blood donors in the study population

YEAR	MALE			FEMALE			TOTAL
	Voluntary male blood bank	Voluntary male camps	Replacement donors	Voluntary female blood bank	Voluntary female camps	Replacement donors	
2011	3003	2244	1371	2	86	12	**6718**
2012	4547	3298	0	5	119	0	**7969**
2013	3556	4857	410	4	225	0	**9052**
	11106	**10,399**	**1781**	**11**	**430**	**12**	**23,739**

Table 2: Overall and yearly Seroprevalence of transfusion transmissible infections in the study

YEAR	HIV	HBV	HCV	SYPHILIS
2011	07 (0.104%)	198 (2.94%)	1 (0.014%)	0
2012	20 (0.25%)	215 (2.69%)	5 (0.062%)	0
2013	15 (0.16%)	224 (2.47%)	3 (0.033%)	0
TOTAL	**42 (0.17%)**	**637 (2.68%)**	**9 (0.037%)**	**0**

Table 3: Seroprevalence in individual group included in the study population

	HIV				HBV				HCV			
YEAR	Vol. male	Vol. female	Rep Male	Rep Female	Vol. male	Vol. Female	Rep male	Rep Female	Vol. male	Vol. female	Rep Male	Rep female
2011	3	0	4	0	134	1	63	0	1	0	0	0
2012	19	0	1	0	213	2	0	0	5	0	0	0
2013	14	0	1	0	221	0	3	0	3	0	0	0
	36	**0**	**6**	**0**	**568**	**3**	**66**	**0**	**9**	**0**	**0**	**0**

DISCUSSION

Blood transfusion is an integral and lifesaving procedure of modern medicine. Simultaneously, it carries the risk of transmitting certain transfusion transmissible infections like HIV, HBV, HCV, syphilis and

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

In the present study prevalence of HIV seropositivity was 0.17%. The seropositivity of HIV infection in other studies were, 0% (Mujeeb and Mahmoud, 1996), 0.1% (Ahmed *et al.,* 2012), 0.3% (Arora *et al.,* 2010), 0.9% (Kulkarni, 2012). The prevalence of HIV seropositivity among voluntary blood donors was 0.16% and replacement blood donors was 0.33%. Higher prevalence of HIV among replacement donors has been documented in various other studies (Singh *et al.,* 2004; Makroo *et al.,* 1996; Chatteraj *et al.,* 2008). Karnataka AIDS prevention society also suggestive of prevalence of 0.5%.

In the present study prevalence of HBV seropositivity was 2.68% and in various other studies was 2.9% (Sawke *et al.,* 2010), 1.7% (Arora *et al.,* 2010), 5% (Chandra *et al.,* 2009), 3.2% (Kulkarni, 2012). The Seroprevalence of HBsAg in Bombay was 6% and 5% in Pakistan (Rahman *et al.,* 1996). HBV is one of the most infectious diseases, major source of transfusion hepatitis and is associated with carrier state and chronic liver disease. The frequency of HBV is more than other TTIs may be because of asymptomatic carrier state.

Seroprevalence of HCV was 0.037%. It is very low compare to the other studies like Kulkarni et al 0.35% (Kulkarni, 2012), 0.5% (Ahmed *et al.,* 2009). There is a wide variation in HCV Seroprevalence in different studies in India. This may be due to the different generation of ELISA test kit having different sensitivity and specificity. Higher prevalence have been reported from a hospital based study in Cuttack, Orissa, Jaipur and Delhi (Mishra *et al.,* 2002; Sharma *et al.,* 2007; Jain *et al.,* 2003). Garg *et al.,* (2001) reported a lower prevalence of 0.28%.

In current study, no blood donor found to be positive for syphilis. 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 reduces the risk of TTIs. Only continuous improvement and implementationof donor screening can ensure a decline in risk of acquiring TTIs.

Conclusion

In the 3-year study period,23,739 units of blood were collected. The Seroprevalence of HIV, HBV, and HCV was found to be 0.17%, 2.68% and 0.037% respectively. Also, the Seroprevalence of HIV and HBV was significantly higher for replacement donors than voluntary blood donors.

The seropositive patients were counselled advised and motivated to accept necessary certain tests and treatment. A heartening fact was that no blood donor was positive for syphilis.

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

It is high time the risk factors associated with blood transfusion be dealt head-on, tackled strategically and solved systematically. Blood transfusion is too valuable a procedure to be neglected and thus the findings of this study as well as certain advices should be seriously considered.

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