Prevalence of Blood Transmitted Infections Amongst Blood Donors

Medical Science

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ABSTRACT

Background:- Blood transfusion is a therapeutic procedure, as there is no genuine substitution. But contaminated blood transfusion can transmit infectious diseases and can be fatal instead of saving life. Blood borne viral infectious diseases are therefore important candidates for public health measures aimed at prevention, early diagnosis and treatment.
Material Methods:- This study were conducted in Blood bank, Government Medical college, Chandrapur, during the period of 1 yr from Jan 2015- Dec 2015.
Observations & Result:- Out of total 8599 donors 96.21% males & 3.79% females. We found Seroprevalence of HIV 0.12%, HBV 0.71%, HCV 0.01% in age group from 18-50 yrs amongst different socioeconomic status.
Conclusion:- Voluntary blood donors are most commonly affected so each donated blood unit should be thoroughly screened and tested before transfusion.

INTRODUCTION:-

Globally, more than 81 million units of blood are donated each year[1]. Blood transfusion is a therapeutic procedure, as there is no genuine substitution. But contaminated blood transfusion can transmit infectious diseases and can be fatal instead of saving life[2]. Transfusion associated infections continue to be a big threat[3]. Worldwide about 350 million people have chronic hepatitis B virus (HBV) infection, and about 125 million have been infected with hepatitis C virus (HCV), putting viral HBV and HCV infection among the world's greatest infectious disease problems. These diseases are therefore important candidates for public health measures aimed at prevention, early diagnosis and treatment[4].

Serological testing for transfusion transmitted diseases had historically been the foundation of blood screening, while newer strategies like nucleic acid testing (NAT) have helped further shorten the "window period"[5]. This generalization is far from reality as judged by our current experience with new testing methodologies. Break through transmissions of viruses (HIV1 and HCV) had occurred as late as 2009 due to NAT failures because of low level of viraemia and/or suboptimal amplification efficiency[6]. Moreover, threat of infectious agents entering the blood supply is not static and may evolve as new pathogens emerge or as old ones change their epidemiological pattern[7]. Therefore, regardless of testing modality chosen, a nonzero risk of disease transmission still exists in all its seriousness[8].

Use of unscreened blood transfusion keep the patient at risk of acquiring many transfusion transmitted infections (TTI) like hepatitis viruses (HBV, HCV), human immune deficiency viruses (HIV), syphilis, malaria etc. Transfusion departments have always been a major portal to screen, monitor and control infections transmitted by blood transfusion. Blood transfusion departments not only screen TTI but also give clue about the prevalence of these infections in healthy populations[9].

MATERIAL & METHODS:- A study was conducted in the blood bank of Govt. Medical College Hospital, Chandrapur, which is tertiary care teaching hospital of Central India and referral centers for the patients residing in Vidarbha, Chhattisgarh and Andhra Pradesh& Karnataka.

A total 8599 blood donors, voluntary as well as replacement, were tested for HIV, HBV, HCV, syphilis and malarial parasite during January 2015 to December 2015. Donors were selected by the standard criteria for the donor fitness.

Samples for HIV antibodies were tested by HIV Micro well Elisa test (TMB J. Mitra and company Ltd., New Delhi). Hepa S-Ag Test (Green Cross Life Science Corp. Korea) was used for the detection of HBsAg by reverse passive hemagglutination test. Test for HCV was carried out using Zhongshan HCV-ELISA kit (Zhongshan Bio Tech Co. Ltd., Zhongshan City Guangdong Province China). Test for syphilis was carried out using rapid plasma regain (RPR) test ("Accucare "Lab-care Diagnostics, Mumbai, India) . Screening for malarial parasite was done by Leishman stain of blood smear.

OBSERVATION & RESULTS :-

Table shows that among all 8599 blood donors, 424 (4.93%) were replacement donors and 8175 (95.07%) were voluntary donors. No professional donor was bleed. 8273 (96.21%) Donors were male donors and remaining 326 (3.79%) were female donors. Out of 8275 male donors 419 (4.87%) were replacement donors while 7854 (91.34%) were voluntary donors. Of 326 female donors 321 (3.73%) were voluntary donors while 5 (0.06%) were replacement donors. The blood donors reported for the study was from both are one as well as rural area. All donors were between 18-50 yrs of age and they were from different socioeconomic era of the society.

Out of total 8599 blood donors, 10 (0.12%) donors were form HIV seroreactive of which, 2 (20%) were replacement donors and 8 (80%) were voluntary donors. All the HIV seroreactive donors

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were male donors.

Seroprevalence of HBV was found to be 61(0.71%) out of 61HBV seroreactive donors, 8 (13.11%) were replacement donors and remaining 56 (86.89%) were voluntary donors. 58 were HBV seroreactive male donors, out of which 8(13.11%) replacement donors, and 53 (81.97%) were voluntary donors. 3 (4.92%) were HBV seroreactive female donors which were from voluntary blood donors group.

Out of 8599 blood donors, 1(0.01%) donor was found to be HCV seroreactive which was male voluntary donor.

No Seroprevalence of syphilis were found in replacement and in voluntary donors.

In this study no blood donor was found to be positive for Malarial parasite.

Out of the total 8175 voluntary blood donors tested, Seroprevalence of HIV, HBV, HCV was found to be 8(80%); 53 (86.89%); 1 (100%) respectively while in 424 replacement blood donors, 2 (20%) blood donors were found to be seroreactive for HIV and 8 (13.11%) donors were seroreactive for HBsAg.

DISCUSSION:-

Majority 96.21% donors were male donors and only 3.79% were female donors.

These findings are similar the study done by Gelaw B. et al[10] 96.3 %, Nwankwo et al[11] 98 %, Koram et al[12] 97.41 %, and Ismail et al[13] 99.6 %, Tessema et al[14], Yusuf et al[25] majority of the donors (98 %) males donors, which is also comparable to the studies done by others. They are Rao and Annapurna et al[18] in Pune, Rose et al[19] in Vellor, Arora D et al[17] in Southern Haryana, Singh K et al[20] in Coastal Karnataka, Pahuja et al[21] in Delhi and Singh B et al[22] noting more than 90% of the male donors.

Study of Pallavi et al[26] showed 38,215 (97.84%) were males and 845 (2.16%) were females. 25,303 (64.78%) were voluntary donors (VD) while 13,757 (35.22%) were replacement donors (RD).

In this study we observed majority of donors were voluntary blood donors 8175 (95.07%) and remaining were replacement blood donors 424 (4.93%). This is comparable to the study done by Bhattacharya et al[23] who has noticed a predominance of VD. In contrast, a predominance of RD was noted by Singh et al[22] (82.4%), Kakkar et al[24] (94.7%), Singh et al[20] (84.43), Pahuja et al[21] (99.48%) and Arora et al[17] (68.6%).

In this study, 0.12% blood donors were found to be HIV seroreactive. In India it ranges from 0.68% to 3.05% in blood donors[29-35]. There is a regional difference in HIV seroreactivity among major cities in India. HIV prevalence studies on special groups like commercial sex workers (CSWs), patients suffering from sexually transmitted diseases (STDs) indicate prevalence in that special group (high risk) studied. But Seroprevalence of HIV in blood donors indicates that there is percolation of HIV in healthy general population because our donors represent a cross-section of adults, predominantly male.

In our study, voluntary donors were found to be affected more than replacement blood donors. All the HIV seroreactive donors were male donors.

In this study, Seroprevalence of HBV In blood donors was found to be 0.71%.

Findings of our study the prevalence rate of HBs Ag were consistent with studies of Yusuf et al[25] of 10.9 %. This figure is comparable with Nwankwo et al[11] 10.9 %, & 10.9 % among street dwellers in Gondar city[15].

In India among blood donors it varies from 0.8% to 4.43% [27-29,34,36,37].

Majority of the hepatitis B seroreactive donors were the voluntary donors and the males. Seroprevalence of HIV was lower than that of HBV in blood donors of this study.

Hepatitis B is one of the most infectious diseases; it has infected around 2 billion people worldwide, including an estimated 400 million chronically infected cases. It is also hyper endemic in sub-Saharan Africa and Asia[2]. The current study finding classifies study area as WHO high endemic classification[16].

HCV has emerged as a major public health problem in the last decade. 0.01% Blood donors were found to be HCV seroreactive in this study. This is comparable with the studies conducted by other workers in India [28,37].

The low prevalence of HCV when compared with HBV might be due to the fact that HCV is less infective when compared with HBV and HCV is transmitted mainly through transfusion of blood or blood products, intravenous drug abuse and needle sharing which may not common in this Vidarbha Region.

In this study no donors were seropositive for syphilis. In India it ranges from 0.38 to 2.3% [34,35,36]

Asymptomatic carriers are the source of transfusion transmitted malaria, although the parasite density is very low. However in this study no donor was found to be positive for malaria parasite.

Study of Pallavi et al[26] found that The overall prevalence of HIV, HbsAg, HCV and syphilis were 0.44, 1.27, 0.23 and 0.28%, respectively. No blood donor tested showed positivity for malarial parasite. The prevalence of HIV, HbsAg, HCV and syphilis among replacement donors were 0.54, 1.23, 0.23 and 0.32%, respectively, while in voluntary donors it was 0.36, 1.22, 0.20 and 0.25%, respectively.

CONCLUSION:-

1. Among all 8599 blood donors, 424 (4.93%) were replacement donors and 8175 (95.07%) were voluntary donors.
2. 8273 (96.21%) Donors were male donors and remaining 326 (3.79%) were female donors. Out of 8275 male donors 419 (4.87%) were replacement donors while 7854 (91.34%) were voluntary donors. Of 326 female donors 321 (3.73%) were voluntary donors while 5 (0.06%) were replacement donors.
3. Seroprevalence of HIV, HBV, HCV and syphilis were found to be 0.12%; 0.71%; 0.01% respectively.
4. Voluntary donors were found to be the mostly affected. Hence voluntary blood donation should be properly screened and tested which may improve the quality of blood.

Table showing Blood transmitted infections with sex wise distribution in voluntary & replacement blood donors

	SEX	VOLUNTORY DONORS	PERCENTAGE	REPLACEMENT DONORS	PERCENTAGE	TOTAL	PERCENTAGE
TOTAL BLOOD DONARS	MALE	7854	91.34	419	4.87	8273	96.21
	FEMALE	321	3.73	5	0.06	326	3.79
	TOTAL	8175	95.07	424	4.93	8599	100

	SEX	VOLUNTORY DONORS	PERCENTAGE	REPLACEMENT DONORS	PERCENTAGE	TOTAL	PERCENTAGE
HIV SEROACTIVE	MALE	8	80	2	20	10	0.12
	FEMALE	-	-	-	-	0	0.00
	TOTAL	8	80	2	20	10	0.12
HBV SEROACTIVE	MALE	50	81.97	8	13.11	58	0.67
	FEMALE	3	4.92	-	-	3	0.03
	TOTAL	53	86.89	8	13.11	61	0.71
HCV SEROACTIVE	MALE	1	100	-	-	1	0.01
	FEMALE	-	-	-	-	0	0.00
	TOTAL	1	100	-	-	1	0.01
SYPHILIS SEROACTIVE	MALE	-	-			0	0
	FEMALE	-	-	-	-	0	0
	TOTAL	-	-	-	-	0	0
MALARIAL PARASITE	MALE	-	-	-	-	0	0
	FEMALE	-	-	-	-	0	0
	TOTAL	-	-	-	-	0	0

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