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Prevalence of the transfusion transmissible infections among blood donors in a blood bank at a tertiary care teaching hospital in north India

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ABSTRACT

Background

Transfusion of blood and its components is a life saving measure in various medical and surgical emergencies. Transfusion carries the risk of transmitting the life threatening transfusion transmissible infections (TTIs) agents like Human immunodeficiency virus (HIV), Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), Syphilis and Malaria.

Methods

The study was conducted at the blood bank of Bhagat Phool Singh Government Medical College for Women, Khanpur Kalan, Sonapat catering the surrounding rural population. The study was carried out for a period of one year i.e. from January 2016 to December 2016 including total 7489 donors with 7301 males and 188 females for screening of the above mentioned infections.

Observations

A total of 7489 donors were screened between January 2016 and December 2016 including 7301 males and 188 females. There were 7420 (99.08%) voluntary donors and the rest 69 (0.92%) as replacement donors (Table-2). Out of the voluntary donors 7232 were males and 188 females.

Conclusion

Blood transfusion services not only screen the blood of donor but also give clue about the rate of prevalence of TTI in asymptomatic healthy young adults. These infections are now quite common. But with good screening methods their spread can be prevented to the recipients.

Keywords: Blood, Transfusion, Transmissible, Infections, Donors.

INTRODUCTION

Transfusion of blood and its components is a life saving measure in various medical and surgical emergencies, in critical care management and also in routine management of diseases. Transfusion of blood is a sensitive issue as it is covered by ‘Drugs and Cosmetics Act’ and has legal implications also. Transfusion carries the risk of transmitting the life threatening transfusion transmissible infections (TTIs) agents like Human immunodeficiency virus (HIV), Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), Syphilis and Malaria. Globally, an estimated 240 million people are chronically infected with Hepatitis B. It is estimated that India has around 40 million HBV carriers. An estimated 180 million people or roughly 3% of world population are currently infected with HCV. HCV infection in India has a population prevalence of around 1% and occurs predominantly through blood transfusion and the use of unsterile glass syringes. As per 2015 data World health organization (WHO) estimated that 36.7 million people are living with HIV/AIDS. In India, 2.40 million people are living with HIV with an adult prevalence of 0.3%. There were around 36.4 million people with syphilis worldwide in 2015. In India in 2015 there were reported 1.13 million cases of malaria. Blood transfusion is one of the major cause of these common infections and one need to be very careful [1-5].

We are reporting the prevalence of infected blood donations reported at our institute and the importance of meticulous testing for these infections to avoid these transfusion transmissible diseases.

Our study is to estimate the prevalence of transfusion transmissible infections(TTIs) i.e. HIV I & II, HBV, HCV, Syphilis and Malaria among blood donors in a blood bank at a tertiary care teaching hospital in North India and to compare the

results with other similar studies conducted and reported from other Institutes.

MATERIAL AND METHODS

The study was conducted at the blood bank of Bhagat Phool Singh Government Medical College for Women, Khanpur Kalan, Sonapat catering the surrounding rural population. The study was carried out for a period of one year i.e. from January 2016 to December 2016 including total 7489 donors with 7301 males and 188 females.

Blood samples were screened by ELISA with Kits from J. Mitra & Co. Pvt. Ltd for HIV I & II, 4th generation Microlisa HIV Ag & Ab, Hepalisa for HBsAg and kit used for HCV antibodies was of Transasia Erba Biomedical Pvt. Ltd. The ELISA was validated by the acceptance criteria laid down by the manufacturer for the absorbance of reagent blank as well mean absorbance of the positive and negative controls provided with the test kits. The cut off value was calculated as per manufacturer’s directions for reporting positive and negative results. Known positive and negative samples were used randomly as external controls in each screening. Screening for Syphilis was carried out by using one step syphilis Anti-TP Test by Alere Medical Pvt. Ltd. Malaria was screened by the Pan Antigen Card Test by J. Mitra & Co. Pvt. Ltd.

RESULTS

A total of 7489 donors were screened during this study period between January 2016 and December 2016 including 7301 males and 188 females (Table-1). There were 7420 (99.08%) voluntary donors and the rest 69 (0.92%) as replacement donors (Table-2). Out of the voluntary donors 7232 were males and 188 females. However all the replacement donors were only males and none was female (Table-3).

Table -1 Distribution of blood donors according to gender

MALES	FEMALES
7301	188

Table 2- Distribution of blood donors as per type of donation

VOLUNTARY DONORS	REPLACEMENT DONORS
7420 (99.08%)	69 (0.92%)

Table 3: Distribution of different types of blood donors according to gender

TYPE OF DONOR	MALE	FEMALE	TOTAL
VOLUNTARY DONORS	7232	188	7420
REPLACEMENT DONORS	69	--	69

There were total 241 reactive cases out of which 234 were voluntary donors and the rest of 7 were the replacement donors. Out of 234 voluntary

donors 231 were males and 03 females while the all 07 replacement donors were males only (Table-4).

Table 4: Reactive cases in different type of blood donors according to gender

REACTIVE CASES	MALE	FEMALE	TOTAL
VOLUNTARY DONOR	231	03	234
REPLACEMENT DONOR	07	--	07
			Total=241

Highest number of reactive cases (77) was observed for HBV closely followed by 75 of HCV cases. There were 72 cases positive for Syphilis

and 14 cases of HIV infection. None of the cases was found positive for Malarial parasite (Table-5).

Table 5- Distribution of different reactive cases

REACTIVE FOR	MALE	FEMALE	TOTAL
HBsAg	77	01	78
HCV	75	02	77
HIV	14	00	14
Syphilis	72	00	72
Malaria	00	00	00
Total	238	03	241

The overall prevalence was then calculated and it was 1.04 for HBsAg, 1.02 for HCV, 0.18 for HIV

and 0.96 for syphilis. There was no case for malarial parasite in the donated bloods (Table-6).

Table 6- Prevalence of reactive cases

TTI	Overall prevalence
HBsAg	1.04
HCV	1.02
HIV	0.18
Syphilis	0.96

Table7. Comparison of various studies for transfusion transmissible infections

Studies done	HIV	HBV	HCV	Syphilis
Bhawani et al (2010) Madhya Pradesh	0.39	1.41	0.84	0.08
Arora et al (2010) Haryana	0.30	1.7	1.0	0.90
Chandra et al (2009) Lucknow	0.23	1.96	0.85	0.01
Pahuja et al (2007) New Delhi	0.56	2.23	0.66	-
Sri Krishna et al (1999) Karnataka	0.44	1.86	1.02	1.6
Arya DR et al (2007) Bikaner	0.10	1.60	0.18	0.89
Gupta et al (2003) Ludhiana	0.08	0.66	1.09	0.85
Tulika C et al (2014) Lucknow	0.08	0.24	0.001	0.01
Nirali et al (2013) Ahmedabad	0.16	0.98	0.11	0.23
Pragnesh J Patel (2015) Gujarat	0.14	0.38	0.06	0.14
Bhawna set et al (2014) Uttarakhand	0.19	0.63	0.20	0.02
Leena MS et al (2012) Andhra Pradesh	0.27	0.71	0.14	0.10
Makroo RN et al (2014) New Delhi	0.24	1.18	0.43	0.23
Karmakar et al (2014) Kolkata	0.59	0.60	1.41	0.23

Purushottam et al (2012) Maharashtra	0.07	1.09	0.74	0.07
S. Awasthi et al(2013) Muradabad	0.10	1.82	0.83	0.13
Gupta N et al (2003)	0.084	0.66	1.09	0.85
Sonia Garg et al(1999) Rajasthan	0.44	3.44	0.28	0.22
Shah et al (2013) Ahmedabad	0.15	0.88	1.01	0.22
Arya et al(2016) Bikaner	0.10	1.60	0.18	0.89
Present study, Khanpur Kalan-Haryana	0.18	1.04	1.02	0.96

DISCUSSION

Blood transfusion carries the risk of transmission of life threatening infections like HIV, Hepatitis-B and Hepatitis-C etc. These are transmitted parenterally, vertically or through high risk sexual behavior and infected syringes. Blood transfusion services not only screen the blood of donor but also give clue about the rate of prevalence of TTI in asymptomatic healthy young adults. There have been various studies (Table-7) conducted on prevalence of transfusion transmissible infections including HIV, HBV, HCV and Syphilis among blood donors in our country [1-15]. It can be considered as a reliable tool for statistical estimation of these common infections in general population [7-10].

The incidence of these infections in our study is similar to the studies done by Arya et al (2007) in Bikaner [1], Gupta et al (2004) [5], Bhawani et al(2004-2009) in Madhya Pradesh [6], Arora et al (2010) in Haryana [9], Pahuja et al (2007) in New Delhi [10], Chandra et al (2009) in Lucknow [11], Srikrishna et al (2009) in Karnataka [13], Karmakar et al (2014) in Kolkata [16], Giri et al (2012) [17], Awasthi et al (2010) [18], etc. Also it is seen that incidence of syphilis is on increase which at one stage was on decline which is an alarming sign and need to be studied and analysed.

REFERENCES

- [1]. Arya DR, Mahawar N L, Pachaury R, Bharti A, Sharma L, Kumar H, Singh VB. Seroprevalence of transfusion transmitted infections among blood donors at a Tertiary Care Hospital Blood Bank in North India. *Indian J Health Sci* 9, 2016, 77-81.
- [2]. Pallavi P, Ganesh CK, Jayashree K, Manjunath GV. Seroprevalence and Trends in Transfusion Transmitted Infections Among Blood Donors in a University Hospital Blood Bank: A 5 Year Study. *Indian J Hematol Blood Transfus.* 27, 2011, 1–6.
- [3]. Datta S. An overview of Molecular Epidemiology of Hepatitis B Virus (HBV) in India. *Virol J* 5, 2008, 156.
- [4]. Narahari S, Juwle A, Basak S, Saranath D. Prevalence and geographic distribution of hepatitis C virus genotypes in Indian Patient Cohort. *Infect Genet Evol* 9, 2009, 643-5.
- [5]. Gupta N, Kumar V, Kaur A. Seroprevalence of HIV, HBV, HCV and Syphilis in voluntary blood donors. *Indian J Med Sci* 58, 2004, 255-7

Keeping in view the prevalence mentioned in these studies we observed that these infections are almost identically distributed all over the country (India) amongst the blood donors. The screening of the blood samples of all the donors help in preventing the spread of infection in the recipients. The method of screening should be sensitive and specific so that it can be detected with authenticity with confirmatory diagnosis. This will help in treating the donor and will avoid the spread of infection in another individual.

CONCLUSION

Availability of safe blood for transfusion is a must for the recipients and community as well. This can be achieved by the strict donor selection, voluntary blood donation, creating awareness among community regarding safe blood, healthy life style, institutional deliveries & immunizations. Proper and strict screening of blood units for TTIs is must for prevention of the spread of these infections. To switch over to better diagnostic techniques like chemiluminescence immunoassay (CLIA) and NAT though cost is the limiting factor for these techniques. These infections as we see from their prevalence are quite common but with good screening methods these infections can be prevented from there spread the recipients and needy patients.

- [6]. Bhawani Y, Rao PR, Sudhakar V. Seroprevalence of common transfusion transmissible infections among blood donors in a tertiary care hospital of Andhra Pradesh from 2004-2009. *Bio Med* 2, 2010, 45-8
- [7]. Attaullah S, Khan S, Khan J. Trend of transfusion transmitted infections frequency in blood donors: Provide a road map for its prevention and control. *J Transi Med* 10, 2012, 20.
- [8]. Gharehbaghian A. An estimate of transfusion transmitted infections in general population. *Hepat Mon* 11, 2011, 1002-3.
- [9]. Arora D, Arora B, Khetarpal A Seroprevalence of HIV, HBV, HCV and Syphilis in blood donors in Southern Haryana. *Indian J Pathol Microbiol* 53, 2010, 308-9.
- [10]. Pahuja S, Sharma M, Baitha B, Jain M Prevalence and trends of markers of Hepatitis C virus, Hepatitis B virus and human immunodeficiency virus in Delhi blood donors. A hospital based study. *Jpn J Inf Dis* 60, 2007, 389-391.
- [11]. Chandra T, Kumar A, Gupta A Prevalence of transfusion transmitted infections in blood donors: An indian experience. *Trop Doct* 39, 2009, 152-154.
- [12]. Makroo RN, Raina V, Kaushik V. Prevalence of Hepatitis C virus antibody in healthy blood donors. *Indian J Med Res* 10, 1999, 123-5
- [13]. Srikrishna A, Sitalakshmi S, Damodar P. How safe are our safe donors. *Indian J Pathol Microbiol.* 42, 1999, 411-416.
- [14]. Garg S, Mathur DR, Gard DK. Comparison of seropositivity of HIV, HBV, HCV and Syphilis in replacement and voluntary blood donors in the western India. *Indian J Pathol Microbiol* 44, 2001, 409-12.
- [15]. Puri GA, Deshpande JD, Phalke DB, Karle LB. Seroprevalence of transfusion transmission transmissible infections among voluntary blood donors at a tertiary care teaching hospital in rural area of India. *J Family Med Prim care* 1, 2012, 48-51.
- [16]. Karmakar PR, Shrivastava P, Ray TG. Seroprevalence of transfusion transmission transmissible infections among blood donors at a blood bank of a Medical college of Kolkata. *Indian J Public Health* 1, 2014, 48-51.
- [17]. Giri PA, Deshpande JD, Phalke DB, Karle LB. Seroprevalence of Transfusion Transmissible Infections Among Voluntary Blood Donors at a Tertiary Care Teaching Hospital in Rural Area of India. *J Family Med Prim Care* 1, 2012, 48-51.
- [18]. Awasthi S, Singh V, Dutta S, Agarwal D, Ansari M, Arathi N. Prevalence of the blood borne infections in blood donors – Our experience in a tertiary teaching hospital in North India. *Internet J Pathol* 12(1), 2010.

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