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TRANSFUSION TRANSMISSIBLE INFECTIONS AMONG HEALTHY BLOOD DONORS AT BLOOD BANK FROM CHILDREN'S HOSPITAL & INSTITUTE OF CHILD HEALTH LAHORE

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ABSTRACT

Objective: To determine the frequency of HIV, HBV, HCV, syphilis and malaria in blood donors at Children Hospital & Institute of Child Health (ICH), Lahore and compare with other local and international published data.

Study Design: Descriptive study.

Place and Duration of Study: This was conducted at the blood bank of Children's Hospital and ICH, Lahore from October 2015 to February 2016.

Patient and Methods: All adult male blood donors who had donated blood during above mentioned period, between 18 to 55 years of age were included in this study. Each and every donor was subjected to a predetermined, prepared questionnaire to find out their eligibility for donation. All blood donors' serum samples were screened for HBsAg, Anti-HCV, syphilis, HIV and malaria by immuno chromatography technique according to manufacturer instruction.

Results: Statistical analysis showed that out of 10,048 blood donors, 7.94% (n=798) were infected with any one of the above mentioned diseases and 92.05% (n=9,250) had no infection. The overall frequency of HBsAg, HCV, HIV, syphilis and malaria were found to be 1.59%, 3.75%, 0.11%, 2.08% and 0.39% respectively. The co-infections of HCV + Syphilis, HBsAg + HCV, HBsAg + Syphilis, HCV + malarial parasite (M.P) and HBsAg + HIV + syphilis was 0.12%, 0.11%, 0.01% and 0.0099% respectively.

Conclusion: There is a decreasing trend of HBsAg, HCV infections but increasing trend of HIV and syphilis infections in blood donors that is an alarming situation.

Keywords: Blood bank, Healthy blood donors, Lahore.

INTRODUCTION

Blood and its components are transfused for life saving purposes but unsafe blood transfusion practices can result in hazardous consequences. There is only 1% probability of transfusion related problems to occur with every unit of blood transfused. It is estimated that each year, around 81 million bags of blood are donated, globally. Out of which, more than 18 million bags are not screened properly[1]. In Pakistan, with a population of 1.8 billion, 1.5 million bags of bloods are required per year. This demand is satisfied 40% by public sector while 60% by private sector[2-4]. In 2005, member states of World Health Organization (WHO) signed a document that bound them for the safe, adequate blood and blood components supply to patients[5]. For the safe and compatible blood transfusion the WHO suggested that donor sample should be cross matched and screened for Hepatitis C virus (HCV), Hepatitis B surface antigen (HBsAg), Human Immuno deficiency Virus (HIV), malarial parasite (MP) and Syphilis. In Pakistan, health controlling authorities have made it compulsory to screen every donor for above mentioned infections but it is not performed properly[4].

Blood transfusion services in Pakistan have formulated blood transfusion policy for 2014 to 2020 with the effort of safeblood transfusion

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policy (SBTP) and with technical support of Deutsche Gesellschaft für International Zusammenarbeit GmbH (GIZ). The mission of SBTP was to ensure access of safe and affordable blood for each and every citizen of Pakistan[6].

Most of the known cases of post transfusion diseases are usually caused by HBV, HCV, HIV, Malarial parasite and Treponema Pallidum. and about 12 million people are infected by syphilis each year[7]. In Pakistan, the Malaria Disease Surveillance Programme in 2006 recorded, 127,825 confirmed cases and reported annual parasite incidence (API) of 0.8 cases per 1000 population[8].

HBV and HCV are transmitted by parenteral route including blood transfusion. Most of the

Table-I: Prevalence of TTI among blood donors reported in local literature published during last few Years.

Authors / Year	Study Place	No of Donors	HBsAg	HCV	HIV	Syphilis	Malaria	Ref no
Farooqi et al. (2007)	Peshawar, Pakistan	17859	1.39%	0.024	0.008%	0	-	4
Waheed U et al, (2009)	Islamabad, Pakistan	18,202	1.92%	3.3%	-	-	-	13
Attaullah et al.(2012)	Khyber Pakhtunkhw, Pakistan	1,27,828	2.68%,	2.46%,	0.06%	0.43%	-	14
Waheed et al.2012	Islamabad, Pakistan	10145	3.91%	8.34%	-	0.89%	1.20%	15
Nazir et al.2013	Lahore, Pakistan	14173	-	-	-	3.1%	-	2
Irfan SM, et al.2013	Karachi, Pakistan	108,598	1.90%	2.61%	0.10%	-	-	16
Tunio SA, et al.2013	Jamshoro, Pakistan	2696	1.82%	3.45%	-	-	-	3
Khan S.,2013	Khyber PakhtunkhwaPakistan	41715		3.85%	-	-	-	17
Nabi SG.,2014	Rawalpindi, Pakistan	246,611	1.63%	-	-	-	-	18
Present study	Lahore, Pakistan	10048	1.59%	3.85%	0.11%	2.08%	0.39%	

Table-II: Prevalence of TTI In other countries.

Authors / Year	Study Place	No of Donors	HBsAg	HCV	HIV	Syphilis	Ref No
Ahmad MU et al. 2009	Bangladesh	12270	1.39%	0.024%	0.008%	-	19
Shrestha et al. 2009	Kathmandu, Nepal	21,716	0.47%	0.64%	0.12%	0.48%	20
Naskar S et al. 2013	Kolkata, India	127596	1.75%	0.37%	0.28%	0.44%	21
Kaure H et al. 2014	Amritsar Punjab	56915	0.75%	1.75%	0.16%	0.67%	22
Zheng X et al. 2015	Zhejiang, China	1,615,120	0.51%	0.25%	0.15%	-	23
Khedmat H et al. 2007	Iran	318029	0.487%	0.093%	0.003%	0.005%	24

Globally, WHO has estimated 2 billion people infected with HBV, 200 million people affected with HCV 33.4 million people living with HIV individuals, infected with HBV and HCV are apparently healthy or asymptomatic, so they are the major source of transmission of these harmful

infections in community. In 1981, AIDS in humans was first reported in USA and HIV was first isolated in 1983[9]. In Pakistan first time HIV-antibody reported in donated blood, in 1988,[10].

HIV is mainly transmitted through genital fluid, blood and from infected mother to newborn infants[11]. Syphilis is a sexually transmitted disease (STD) that is widespread in developing and developed countries.It is transferred vertically and it is caused by Treponema Pallidum which is a spirochete bacterium. People who are suffering from STD like syphilis also have a chance of co-infection with HIV. Malaria is still a risk factor for half of the world's population. Malaria can be transmitted by anopheles mosquito, contaminated syringes, blood transfusion and placenta[12]. This study aimed to determine the existing frequency of HIV, HBV, HCV, syphilis and malaria in blood donors at Children hospital & ICH, Lahore and compare with other local and international published data. The data will help to plan the strategies of blood screening in our blood bank setup and monitor the future trend of these transfusion transmissible diseases.

SUBJECTS AND METHODS

It was hospital based descriptive study conducted at the blood bank ofChildren's hospital & ICH. Blood bank records from 1 October 2015 to 12 February 2016 were analyzed with the approval of hospital authorities. Written Informed consent was obtained from all the blood donors. Non probability consecutive sampling technique was used. Total 10,048 blood donors' data were collected. Before blood donation all the donors were subjected to a predetermined, planned questionnaire to decide their eligibility for donation as per the criteria set by our institute. Allblood donors fulfilling inclusion criteria were included in this study (e.g males, with Age range between 18 to 55 years,weighing more than 50 Kg, hemoglobin ≥13g/dl. The donor that is not fulfilling the standard criteria of a donor (giving the history of jaundice, malaria, drug addiction, anemia, frequent transfusions and any evidence of hepatitis C, hepatitis B or HIV syphilis and malaria positive test result, history of dental procedure or fever in the past one week, history of vaccination in last 1-4 weeks, were excluded from the study.

Three to 5 ml of blood sample was taken from each and every donor and after centrifuge, serum was separated. Donors' serum samples were screened for HBsAg, and Anti-HCV, syphilis, HIV and malariaby ICT technique according to manufacturer instruction (Intec biotech, China).

The data was entered in computer software SPSS version 20. Frequencies and percentages for (all 5 infections) variables were calculated by using descriptive statistics.

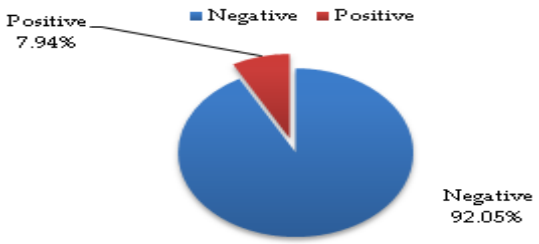

Figure-1: Frequency of infected and non infected blood donors (n=10048).

RESULTS

Out of 10,048 blood donors screened, statistical analysis showed that, 7.94% (n=798) were infected and 92.05% (n=9250) were safe for transfusion (fig-1). The overall frequency of HBsAg, HCV, HIV, syphilis and malaria was found to be 1.59%, 3.75% 0.11%, 2.08% and 0.39% respectively (fig-2). Out of these blood donors, 7.65% (n=769) had ICT evidence of infection with at least one infectious marker, 0.27% (n=28) had dual infections while only 0.0099% (n=1) had triple infection. The co infections frequency of HCV/ Syphilis, HBsAg /HCV, HBsAg/Syphilis, HCV/MP and HBsAg/HIV/syphilis was 0.12%, 0.11%, 0.01% and 0.0099% respectively (fig-3).

DISSCUSION

Blood transfusion is a life saving process and helps countless people worldwide. It is also an important mode of transmission of infection to the recipients. In developing countries, the prevalence of TTI is much higher and quite far from attaining a zero risk level at the present moment[7]. Our study findings have clearly shown the decreasing trend of HBsAg, to some extent persistent results of HCV but increasing trend of HIV and Syphilis as compare to previous local and international published data. Our study showed 39 positive cases of malarial parasite on screening as well (fig-2, table-I).

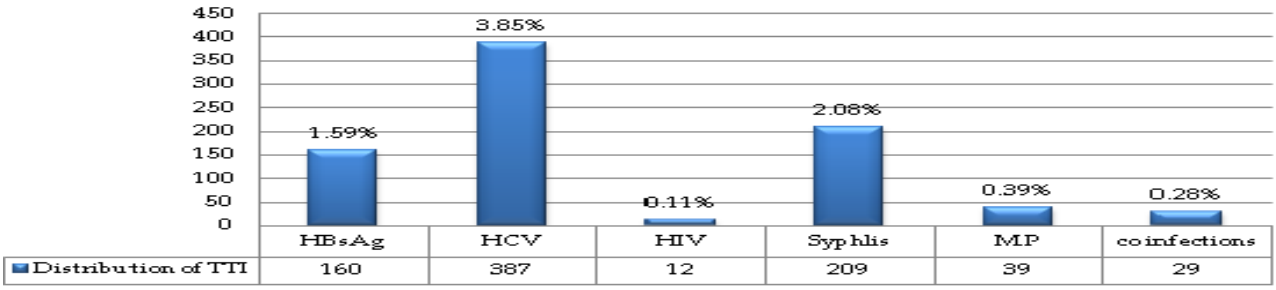

Figure-2: Frequency of HBsAg, HCV, HIV, syphilis and malaria.

HBsAg = hepatitis B surface antigen
HCV = hepatitis C virus
HIV = human immunodeficiency virus
MP = malarial parasit
Co-infections = e.g HBsAg + HCV, HCV + Syphlis

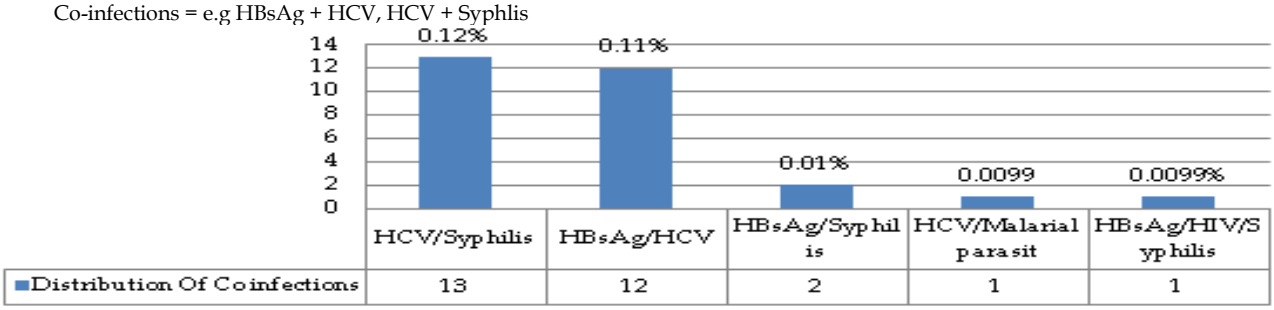

Figure-3: Co infectivity rate in blood donors.

HBsAg prevalence ranges from 1.39% in Peshawar to 3.91% in Islamabad, in our study it was 1.59%. HCV prevalence in asymptomatic blood donors varies from 0.024%[14] (Peshawar) to 8.34%[15] in Islamabad but most of the studies showed persistent results[3,13,17] with our study that was 3.85% (fig-2, table-I). Co infection of HBsAg/HCV in our study was 0.12% that is higher than 0.074%[3] reported in Jamshoro and 0.07% in Armed Forces Rawalpindi[23] (table-I).

As compared to HBsAg and HCV,HIV and syphilis showed increasing trend as compared to previous published data. HIV prevalence ranges from 0.008%[4] to 0.10%[16] and in our study it is 0.11% (fig-2, table-I). The annual prevalence of HIV in donors at the Aga Khan University blood banks ranged from 0.013% to 0.116%[10], these findings are also consistent with our results. As shown in table-I, Syphilis prevelance showed increasing trend of syphilis form (2007 to 2013) 0%[4] to 3.1%[2], in our study it was 2.08% as well. Our results showed 39 positive cases (0.38%) of malaria which were asymptomatic. The high prevalence of malaria is very serious and every donor should be screened for malarial parasite.

The prevalence of TTI varies in different countries (table-II). Prevalence of Hepatitis B[18] and HCV was also found to be low in Bangladesh, Nepal, India , China and Iran[19-

[21,23,24]. Results of HIV prevelance varies from 0.003%[24] to 0.16%[22] also showing increasing prevelance of this infection. The syphilis prevalence was very low andvaries from 0.005%[24] reported in Iran (2007) to high 0.67%[22] reported in Amritsar (2014) consistent to our study findings. Malarial parasite prevalence varies from 0.03% in Bangladesh to 0.52% in China[25] and our findings arealso consistent with these studies including an Indian study; they also reported 0.33% prevalence of malarial parasite in healthy blood donors[26]. The HBsAg and HCV shown decreasing trend may be due to the effective screening of blood donors, increased availability of interferon treatment for HCV, availability of oral treatment for HBV and its preventive Vaccination, awareness about risk of re-used syringes and improved infection control practice followed by health care workers[27].

Public sector hospital setup in Pakistan, screening of blood donorsis done on devices which is a suitable and cost effective method, however these results should be reanalyzed with more sensitive technique such as ELISA to rule out false positive cases.

CONCLUSION

There is a decreasing trend of HBsAg, HCV infections but increasing trend of HIV and syphilis infections in blood donors that is an alarming situation. Thus urgent and vigilant screening of HIV, HBV, HCV, syphilis and malaria is required for blood donors. Moreover, mandatory quality assured screening should be available in blood banks. These efforts can prevent the transmission of these diseases.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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