ORIGIN AL ARTICLE

Seropositivity of Hepatitis B and C in Healthy Blood Donors at Ghurki Trust Teaching Hospital, Lahore, Pakistan

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ABSTRACT

Background: The annual requirement of blood in Pakistan is roughly estimated to be 1.5 million bags[1]. However, to meet such a demand many health protocols are neglected which give rise to the most feared complication; Viral Hepatitis. Hepatitis B (HBV) and Hepatitis C (HCV) infections are known to materialize very frequently in the general population. This is because their mode of transmission is through blood and its related products.
Aim: To estimate the seroprevalence of HBV and HCV in voluntary blood donors of the local area surrounding Ghurki Trust Teaching Hospital, Lahore.
Methods: A cross-sectional study was conducted at GTTH, Lahore from 1st January 2019 to 31st December 2019. It was implemented on a total of 17914 healthy volunteers. All of them were screened for Hepatitis B surface antigen (HBsAg) and anti-hepatitis C antibodies (anti-HCV antibodies) by Abbott Architect Ci 4100. The male patients' ages varied from 20 to 60 years and the females' ranged from 20 to 35 years.
Results: Out of 17914 volunteers, 17799 were males and 115 were females. 368(2.05%) volunteers were tested positive overall (HBV, HCV) out of which 150 volunteers had HBV (0.83%) and 218 had HCV(1.22%). Out of 150 HBV positive volunteers only 8 were females (5.3%) and the rest 142 (94.67%) were males.
Conclusion: This study disclosed that the widespread presence of HCV is much higher than HBV in the population and males in general are the majority carriers of these infectious agents. Rigorous awareness campaigns, screening and health protocols are required to reduce the occurrence of Hepatitis B and C in the general population.
Keywords: HBsAg, HCV, Healthy volunteers

INTRODUCTION

Blood has been used for numerous reasons since 1930. It is the very force that drives the living tissue to function properly[2]. The demand for blood is rising with every passing second which requires ample blood donations from the population. However, this comes at a cost; blood borne infections. Globally, the eighth highest cause of mortality is viral hepatitis[4]. Viral hepatitis B and C collectively affect 325 million people worldwide and is responsible for causing 1.4 million deaths a year. Furthermore it is the second major killer infectious disease after tuberculosis. People are infected 9 times more with hepatitis than HIV. On the bright side, hepatitis is preventable, treatable, and in the case of hepatitis C, curable. However, almost 80% of the people living with hepatitis have inadequate access to preventive measures, testing facilities and effective treatment services[3]. At this accelerated rate an estimated 20 million deaths will occur between the years 2015 and 2030[4]. The problem in developing countries has inflated due to poor socioeconomic stature of patients who are made to afford expensive treatments[5] .In Pakistan over 90 per cent of total blood is donated for transfusion by the friends and relatives of the patient. However, around 10 to 20 per cent of blood is still donated by professional donors[1].Hepatitis B has chronically infected almost 350 million people globally[6]. There are estimated 180-200 million HCV carriers worldwide, most of them are thought to be in developing countries[7]. In Pakistan it is approximated through different cross sectional studies that around 9 million carriers of hepatitis B and over 14 million carriers of hepatitis C exist hroughout the population[8].

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Chronic Hepatitis infections can lead to serious complications such as liver cirrhosis, hepatocellular carcinoma and liver failure[9]. The best way to overcome these infections is following secure blood transfusion protocols. According to WHO the term safe blood transmission refers to the judicial and logical administration of screened blood and blood related products for curative and restorative purposes. WHO further recommends that administered blood be cross matched for compatibility as well as tested for five transfusion-transmitted infections which are HIV, HBV, HCV, Syphilis and Malarial Parasite (MP)[10]. The goal of this study were to find the incidence of only HBV and HCV among apparently healthy participants.

SUBJECTS, MATERIALS AND METHODS

Subjects: There were a total of 17914 healthy volunteers out of which 17799 were males and 115 were females who reported to the Blood Bank of GTTH, Lahore from 1st January 2019 to 31st December 2019. For the contribution of blood an extensive undertaking of history and detailed physical examination of the volunteers was carried out by trained medical personnel. Volunteers were required to fill out consent form prior to donation. The inclusion standard had sufficient age group (males ranging from 20 to 60 years and females from 20 to 35 years), non-hypertensive, non- diabetics, afebrile, non-smoker and non-pregnant females. The minimum weight requirement for males was above 55 kg and for females above 50 kg. For the purpose of carrying out prescreening tests 10 to 15cc of blood was withdrawn. The screening tests include CBC, Blood Grouping and Malarial Parasite (MP) detection. Blood hemoglobin levels higher than 14.5g/DL in males and 13g/DL in females were regarded to be

most favorable. In addition to that several measures were included such as ensuring that the volunteers were regular blood donors (had their last blood donation done at least 3 months ago) and were post prandial. The exclusion criteria includes Hb levels equal to or lower than 12g/DL, malnourished individuals, pregnant and menstruating females and any previous incidence of viral infections. Furthermore volunteers were inquired for any drug abuse, body tattooing/piercing, cardiac, pulmonary, renal or hepatic dysfunction and any sort of blood or blood component transfusion in the last one year.

Methods: A descriptive cross sectional study was carried out from 1st January 2019 to 31st December 2019.

Materials: Blood taken from each volunteer was analyzed using the Chemiluminescent Microparticle Immunoassay (CIMA) Technology by Abbott Architect ci4100. For HCV the qualitative detection of antibody to HCV (anti-HCV) in the serum and plasma were detected using the kit Architect Anti-HCV6C37. For the qualitative detection of HBV again CIMA Technology was employed and the kit used was Architect HBsAg Qualitative II Reagent Kit (2G22). Overall specificity and sensitivity for the detection of anti-HCV is reported to be 99.60% and 99.10% respectively. For HBsAg detection the specificity and the sensitivity reported are >99.5% and 100.00% respectively.

RESULTS

The blood donors screened during the 12 month investigation period from 1st January 2019 to 31st December 2019 were 17914. Out of which 17799 (99.36%) were males and 115 (0.64%) were females. Overall 368(2.05%) volunteers were tested positive for combined HBV and HCV. A total of 150 volunteers had HBV (0.83%) and 218 had HCV (1.22%). Out of 150 HBV positive volunteers only 8 were females (5.3%) and the rest 142 (94.67%) were males. Out of 218 HCV positive volunteers only 12 (5.5%) were females while the rest 206 (94.5%) were males

Table 1:Vvolunteers reporting in each month at GTTH, Lahore

Month	Total Volunteers	Males	Females
January 2019	1372	1362	10
February 2019	1318	1304	14
March 2019	1571	1564	7
April 2019	1722	1709	13
May 2019	1477	1469	8
June 2019	1368	1363	8
July 2019	1696	1689	7
August 2019	1601	1594	7
September 2019	1421	1414	7
October 2019	1591	1578	13
November 2019	1387	1378	9
December 2019	1390	1375	15

Table 2: Total number of Hepatitis C positive cases in blood donors at GTTH, Lahore

Result	Males	Females	Total
Positive Cases	206	12	218
Percentages	94.50%	5.5%	1.22%

Table 3: Total number of Hepatitis B +ve donors at GTTH,

Result	Males	Females	Total
Positive Cases	142	8	150
Percentages	94.67%	5.3%	0.83%

Fig. 1: Serpositivity of HBV and HCV in Blood Donors at GTTH, Lahore

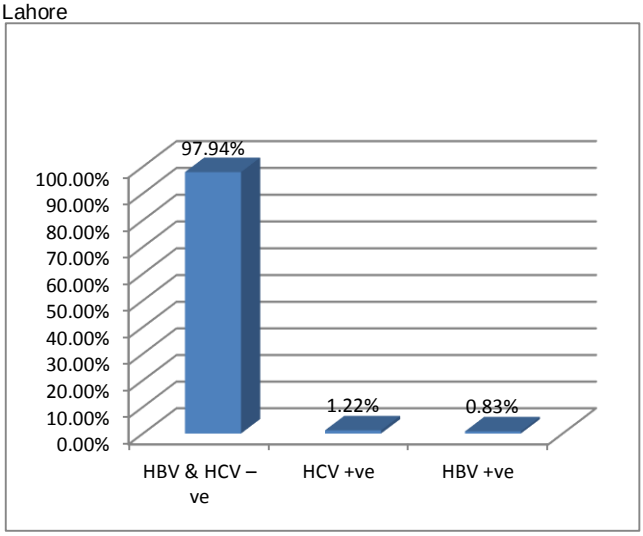
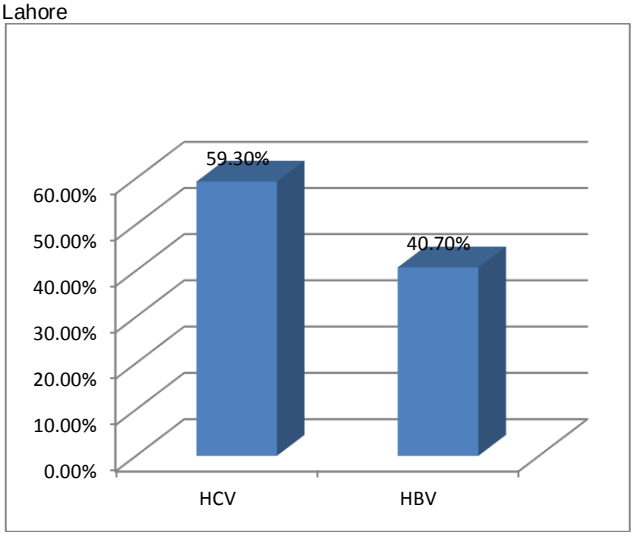


Fig.2: HBV and HCV in combined seropositive donors at GTTH, Lahore



DISCUSSION

Control of HCV and HBV infections is one of the biggest challenges to the health professionals all over the world. The majority of the developed nations have successfully overcome this hurdle through rigorous vaccination and controlling of the risk factors to prevent its spread in the population. However, many developing and under developed countries including Pakistan still face this hurdle possibly due to the fact that the health care system still needs to work hard in many areas[11]. Of the many listed risk factors the most commonly identified among the population was the administration of parenteral injections. Other common risk factors included dental work, surgery and having a first degree relative with the same infection. Some other risk factors included spousal transmission, hemodialysis, sexual exposure and vertical transmission. All in all it is justified to say that spread of this disease depends on multiple risk factors and not one single risk factor contributed to the infectious condition in the patients as many of them reported to be exposed to more than one potential risk factor[12].Furthermore a very common practice in our health care setting and community is administrating

injections even for minor illnesses in rural areas. Lack of education, low socioeconomic status, and precarious health practices and unscreened blood transfusions have further weakened us in our fight against these infections[13]. Hepatitis has reached an alarming increase in Pakistan in current years to as high as 15 to 20 million people[14]. In a similar study carried out from September 2011 to August 2012 in GTTH, Lahore the seropositivity of HBV was 3.94% and that of HCV was 12.10% while in patients with both HBV and HCV was 0.246%[15]. In another study conducted by The Orthopedics Department of GTTH, Lahore from January 2016 to December 2016 showed the seroprevelance of HBV to be 17.39% and that of HCV to be 6.38%[16] by screening methods. However our study revealed the seropositivity of HBV to be 0.83% and that of HCV to be 1.22% on chemiliminescence. This shows considerable reduction of both HBV and HCV infection in the population over the years. The reason for the reduction in the seropositive patients might be due to multiple reasons. One being that our study's sample size is very large, secondly both previous studies were conducted on Immunochromatoghraphic (ICT) devices. Similarly introduction of a policy which inhibits the reuse of syringes and replacing them with auto disable ones and establishment of incinerators for effective waste disposal in hospitals[17]. In recent years the educational campaigns and the health education of the community has been encouraged and people have responded and accepted the fact that such infections could be prevented if hygienic methods are employed. The epidemiology of HBV infection has changed widely with time as hepatitis B prevention programs have become effective. However the incidence rates of HBV in the province of Baluchistan were the highest with 4.3% followed by Sindh which were 2.5%. On the other hand Punjab has the highest prevalence rates of HCV 6.7% and Sindh has the second highest rates which are 2%[18].

Our study furthermore denoted that the incidence of both HBV and HCV in females (5.3% and 5.5% respectively) was relatively low as opposed to that in males. The reason might be that HCV infection is spread through sharing needles and through sexual contact. Men are more prone to develop hepatitis infection if they have a past record of venereal diseases or HIV and have had intercourse with multiple people[19].In2016 WHO made an estimation that approximately 399 000 people died from HCV infection mainly because of developing complications of cirrhosis and hepatocellular carcinoma[20]. The reason for such high numbers is that hepatitis remains undiagnosed for a long period of time. It is usually very late when the patient develops symptoms and access to diagnosis and medical care is also very low. Currently the best method to be safe from hepatitis infection is prevention which includes good personal hygiene, avoiding sharing of needles and blades, proper screening of blood and blood related products, practicing safe sex, proper training of health personnel, immunization and regular monitoring for early diagnosis.

CONCLUSION

It is concluded from the analysis that Hepatitis C is more common in volunteers as compared to Hepatitis B infection and its incidence is very common in males as compared to females. Since blood is the main source of transference of the infection it only makes it more significant that screening of the blood prior to transfusion should be done to avoid its spread. Furthermore the prevention of Hepatitis B can be easily done through vaccination and that of Hepatitis C can be done through simple precautions for example safe blood transfers, using sterile injections, practicing safe sex and proper screening blood and blood products. The masses should be educated about hepatitis and other viral infections and professional blood donors should be strictly discouraged.

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