ORIGINAL ARTICLE

PRE-DONATION SCREENING OF VOLUNTEER PRISONER BLOOD DONORS FOR HEPATITIS B AND C IN PRISONS OF PUNJAB, PAKISTAN

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Background: Prisoners as a high risk group are never recommended for blood donations. In Pakistan, prisoners are legally allowed to donate blood and get thirty days extra remission. Inspectorate of prisons allowed Alizaib Foundation for blood donation camps subject to pre-donation screening of volunteer prisoner blood donor against infectious diseases. This study was conducted to identify the potential benefits of pre-donation screening. **Methods:** This cross sectional study was conducted in October, 2009 in Punjab. Intending volunteer prisoner blood donors from January, 2007 to September, 2009 from prisons of Punjab were included. Physically fit were tested for Hepatitis C Virus (HCV) and B Virus (HBV) by Rapid test kit before bleeding. Data was analysed by Epi-Info. **Results:** A total of 5894 male volunteer prisoner donors were screened and 1038 (17.6%) were rejected. The mean age was 28 years (range: 17–70 years). Of 5894, 857 (14.5%) were HCV positive and 222 (3.8%) were HBV positive. HCV & HBV co-infection was present among 41 (0.7%). Being convicted prisoner blood donor is significantly associated with higher seroprevalence for HCV (OR 1.35, 95% C.I. 1.17-1.57) and being under trial prisoner is significantly associated with higher seroprevalence for HBV (OR 1.40, 95% C.I. 1.06-1.85). **Conclusion:** Hepatitis B & C viruses were responsible for almost 18% prisoner blood donor rejection. Pre-donation screening of blood donors is an effective intervention to improve the safety and limit the cost of blood. Treatment of identified cases may contribute to public health. In the international scenario this study findings necessitate the amendments in the relevant prison rules.

Keywords: Pre-donation screening, prisoner blood donors, Punjab, Pakistan

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INTRODUCTION

Blood donations play a pivotal role for saving lives of patients of thalassemia, haemophilia, severely anaemia, hepatitis, and during acute emergencies subject to the condition that blood is safe. Infected blood will be injurious to health of recipients. The screening of donors is vital to ensure the delivery of safe blood to the public.[1] The prevalence of various sexually transmitted infections (STIs) among routinely accepted blood donors is well documented.[2–4] Blood borne pathogens are efficiently transmitted by percutaneous (e.g., needle-stick, shaving blades) exposure to infectious blood and transfusion of blood and blood products. Hepatitis B (HBV), HIV and Syphilis are also transmitted by per mucosal body fluids (e.g., semen, vaginal fluid).[5]

The prevalence of hepatitis B virus (HBV) infection is estimated to be 2.5% and that of hepatitis C virus (HCV) infection 4.8%, in Pakistan. It is one of the highest rates in the world.[6] Blood donor studies in Pakistan showed prevalence of HCV ranging from 0.82–6.21%. Similarly most of the studies, based on screening of donors at blood banks in Pakistan gave prevalence rate of HBV less than 3.54%.[7–19]

The high transmission of blood-borne viruses i.e. hepatitis B virus (HBV), and hepatitis C virus (HCV) in prisons is well known for several years.[20–22] Prisoners are disproportionately affected by these infections, with prevalence of two to ten times higher than in the general population.[23] Prisoners have high risk behaviours including unsafe sexual practices, sharing shaving blades and syringes. In prisons male to male sex (MSM) practice exists especially in juvenile and drug addict barracks. Young age and first time offenders are forced for sexual favour by elders. Overcrowding in these barracks also fuels the high risk sexual behaviours among them.[24]

MATERIAL AND METHODS

This cross sectional study was conducted in October 2009 by the authors and Alizaib Foundation wherein data was retrospectively collected. Alizaib Foundation is an NGO, with well-equipped laboratory and qualified laboratory staff. Its objective is to identify, register and treat haemophilic and thalassemia patients. Haemophilic and thalassemia patients need blood transfusion at regular intervals throughout life. To provide blood transfusion to these patients foundation need that blood and blood products should be available in their bank round the clock. So to collect blood from willing blood donors,

they arrange blood donation camps in general population, i.e., colleges, universities, factories, markets as well as in prisons of Punjab round the year. To ensure the safety of blood, blood donors are checked by a doctor for physical fitness. Physically fit willing prisoner donors are also tested for HCV and HBV by rapid test kit before donation as per direction of Inspectorate of Prisons. All volunteer prisoner donors from January, 2007 to September, 2009 were included. Data regarding, age, type of prisoner and prison of confinement were collected for each volunteer prisoner blood donor. The Epi-Info version 3.5.1 was used for data entry and analyses while charts were made using Microsoft Office. The frequency data were compared by chi-square test. Odd ratios (OR) were calculated by using univariate analyses. A *p*-value less than 0.05 (2-tailed) was considered statistically significant.

RESULTS

A total of 5894 intended volunteer prisoner donors were screened and 1038 (17.6%) were rejected. All were male. 65% intended donors were between the ages of 21–30 years. Of 5894, 2219 (37.6%) were convicted prisoners (mean age 29 years) and 3675 (62.4%) under trial prisoners (mean age 27 years); 857 (14.5%) were HCV positive and 222 (3.8%) were HBV positive. Dual infection with HBV and HCV was 0.7%. Of 2219 convicted prisoner donors, 366 (16.5%) were HCV positive and 81 (3.7%) were HBV positive. Of 3675 under trial prisoner donors, 491 (13.4%) were HCV positive and 141 (3.8%) were HBV positive. We also analysed data on region basis. Region wise prevalence of HCV and HBV is shown in figure-1. Age-wise distribution of intended prisoner donors and prevalence of HCV and HBV is presented in table-1. To see the temporal trend year-wise distribution of cases is shown in table-2. Being convicted prisoner blood donor is significantly associated with higher seroprevalence for HCV (OR 1.35, 95% C.I. 1.17-1.57, $p<0.05$) and being under trial prisoner is significantly associated with higher seroprevalence for HBV (OR 1.40, 95% C.I. 1.06-1.85, $p<0.05$).

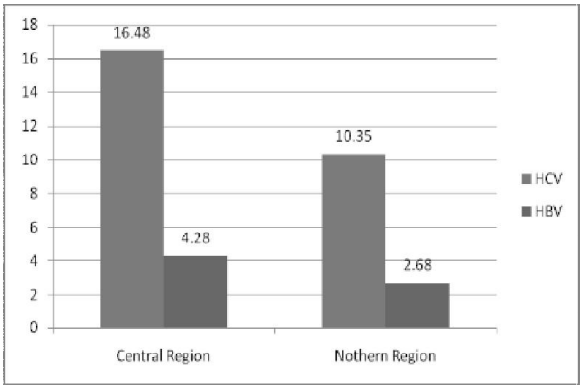

Figure-1: Region wise prevalence of HCV& HBV among volunteer prisoner donors

Table-1: Age wise prevalence of HCV& HBV among volunteer prisoner donors

Characteristic Age Group (yrs)	Prisoners Screened n (%)	HCV n (%)	HBV n (%)
17–20	571 (9.69)	46 (8.06)	16 (2.80)
21–30	3847 (65.27)	549 (14.27)	142 (3.69)
31–40	1221 (20.72)	217 (17.77)	545 (4.44)
41–50	229 (3.89)	43 (18.78)	9 (3.93)
51–70	26 (.44)	2 (7.69)	1 (3.84)
Total	5894 **(100)**	857 (14.5)	222 (3.8) **379 (100)**

Table-2: Year wise prevalence of HCV& HBV among volunteer prisoner donors

Years	Prisoners Donors Screened n (%)	HCV n (%)	HBV n (%)
2007	1935 (32.83)	251 (12.97)	63 (3.26)
2008	1994 (33.83)	324 (16.25)	62 (3.11)
2009	1965 (33.34)	282 (14.35)	97 (4.94)
Total	5894	857 (14.54)	222 (3.77)

DISCUSSION

High prevalence of these infections as compared to general population blood donors indicates that prisoners are high risk group. Prisoner blood donation is prohibited worldwide even for research purposes. So the studies regarding prevalence of these infections among prisoner blood donors are scarce.

This study is believed to be the first of its type in the country. High HCV prevalence simulates with an 'outbreak' like situation of HCV within prison settings of Punjab province. The prevalence of HCV among intended healthy prisoner blood donors is three times high and HBV 1% high as compared to general population in Pakistan.[7] This study supports previous reports that prisoners represent a high-risk group for blood borne diseases and prevalence of HCV and HBV is many times higher than general population.[25–31]

The prevalence of HCV is 14.54% and HBV 3.8% in this study. In the medical and public health literature review over a 13-year period (January 1994–September 2007) prevalence of HCV was found 3% and HBV 2.4% among healthy adult blood

donors in Pakistan.[32] Another study revealed prevalence of HCV Infection 2.4% among replacement blood donors and 1% among voluntary blood donors in Pakistan.[33] Another study shows prevalence 4.85%.[34] A study conducted in Abbottabad showed that 1.97% patients were positive for HBsAg, and 1.57% were positive for anti-HCV antibodies.[35] At services hospital Lahore it was found 4.97% among healthy blood donors.[18,36] In railway hospital Rawalpindi prevalence of HCV was 6.2% and HBV1.8% but in CMH Sialkot prevalence of HCV among volunteer blood donors was 6.52%.[7] In a study conducted in Shaukat Khanum Cancer Hospital including volunteer and replacement blood donors found HCV and HBV prevalence 3.68% and 2.22% respectively. This study includes blood donation of ten years.[37] The data published with respect to prevalence of HBsAg among the blood donors of Pakistan since the year 2005 to date indicates that the average prevalence of HBsAg was 3.02% in Punjab.[38]

The prevalence of HCV and HBV are showing regional trend. Prevalence of HCV and HBV are high among intended prisoner blood donors of Central Region as compared to Northern Region. Almost no increasing or decreasing temporal trend in the prevalence of HCV and HBV is seen during three consecutive years.

Limitations: Our study does have some limitations. This study was conducted in a single institution, so results may have been influenced by characteristics of the donor population, specific practices in donor recruitment or sensitivity and specificity of the screening assays used. Therefore, results may not be generalizable to other segments of the society or the population.

CONCLUSIONS

It is clear that prevalence of HCV among intended prisoner blood donors is 2–5 times high and HBV 1.4–2% high as compared to general population volunteer blood donors. This is underling reason of not recommending prisoners for blood donation. The probability of infection from an exposure varies in proportion to the prevalence of the virus in the population. Among the population with high prevalence of HCV and HBV the risk of missing the detection of antibodies against these viruses during window period is high.

It is evident from this study that pre-donation screening substantially minimizes the risk of collection of infected blood for donation. On the other hand it also identified the disease burden which facilitates evidence based policy making for prevention and control of these infections in this population. Prison period is an ideal time for treatment of positive cases and to educate those who are at risk. The prisoners have their own circle of relations. Prisoners are influential in this circle and their messages are considered to be responded. So education of a prisoner means educating a group or gang as peer education and so is a self-continuing process.

AUTHOR'S CONTRIBUTION

AP: Conceived the study, did literature review, developed the methodology, analyzed and interpret the data. Then he write the first draft of manuscript. Then he finalized the manuscript based on comments/feedback of other authors.

IQ: Supervised the whole laboratory process; Blood Sample collection and testing for HCV & HBV. He collected and compiled data. He facilitated literature review, introduction, and methodology and reviewed the first draft of manuscript. THR, IQ: Facilitated data collection, review the results and first draft of manuscript and share their comments for its improvement.

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