

FREQUENCY OF HEPATITIS B AND C SEROPOSITIVITY IN PRISONERS

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This study was conducted on prisoners of Central Jail, Bahawalpur and on blood donors at Blood Bank Bahawal Victoria Hospital (BVD), Bahawalpur from 1st August 2005 to 30th November 2005. The intension was to study the seroprevalence of hepatitis B and C in prisoners and to note risk factor if any predisposing to the infection. All the prisoners of central jail Bahawalpur present during the study period, aged more than 18 years of either sex were included as the study group and a comparative group was blood donors presenting to blood bank BVH, Bahawalpur during this period. All the cases in study group (2086) as well as control group (9714) were screened for hepatitis B (HBs Ag) and hepatitis C (anti-HCV) infection detected on serum by One Step Test Device. All the positive cases were confirmed by Enzyme Linked Immunosorbant Assay. After an explanation, verbal consent was taken and a questionnaire was filled before taking samples from all the study group cases. On the basis of screening, prisoners were divided into seropositive group and sero-negative group. The different variable applied on both the groups were age, sex, occupation, residence, marital status, self shaving / by barber, family history of (H/o) jaundice, H/o blood trans-fusion, operation, tattooing and body piercing, drug abuse, same sex / extramarital sex and hepatitis B vaccination status. Total prisoners screened were 2086. Out of them 2072 were males (99.3%). Mean age was 34 years. Total seropositive cases were 249 (11.9%) While during the same period seropositivity in blood donors (control group) was 5.9%. Seropositivity of HBV was 5.6% in study group and 3.1% in control group ($p < 0.001$), HCV was 6.3% Vs 2.8% ($p < 0.001$), statistically very significant difference. Risk factors analysis among prisoners revealed that drug abuse was significantly associated with seropositivity (27% Vs 12%, p value < 0.001). Among drug abusers, very high percentage of intravenous drug users was positive (89.2%, 25 out of 28). Prisoners shaved by barber were also at higher risk than self shaving (p value < 0.001). H/o operation ($p < 0.02$) and rural origin ($p < 0.02$) were other significant risk factors. Other risk factors evaluated were not statistically significant. Seroprevalence of hepatitis, both B and C is more in prison inmate than healthy blood donors. Main risk factor in them is drug abuse, especially intravenous. Other significant risk factor is shaving by barber. There is a need to make some strategy to reduce the risk factors.

Viral hepatitis is a global health problem. Hepatitis B as well as C is major cause of chronic hepatitis and an important cause of hepato-cellular carcinoma.¹⁻² Worldwide HBV (hepatitis B virus) carriers are about 400 millions of which 250 million reside in Asia.³ Pakistan stands in intermediate prevalent area with carrier rate of 3-4%⁴ and the estimate of carriers is 4.5 million. HCV (hepatitis C virus) prevalence is 3% world-wide⁵ whereas in Pakistan it is almost 6%⁶, with an estimate of about 10 millions persons affected⁷. Risk factors encountered are blood transfusion, surgery, I/V drug abuse, nasal cocaine, hemodialysis, STD, multiple sexual partners and homosexuality⁸.

High prevalence rate have been described among specific groups considered to be at higher

risk for HBV and HCV infection, including prison inmates. High percentage of prisoners is recorded to inject drugs in many countries⁹⁻¹¹, are prone to other risk factors also. In the given situation, it is important to know both the prevalence of these infections and the pattern of risk behaviors in prison environment so that appropriate preventive strategy can be instituted.

SUBJECTS AND METHODS

Study Setting

This study was conducted on prisoners of Central Jail Bahawalpur and on blood donors at Blood Bank of Bahawal Victoria Hospital (BVH), Bahawalpur from 1st August to 30th November 2005.

Inclusion Criteria

All the prisoners of central jail Bahawalpur present during the study period, aged more than 18 years of either sex were included as the study group and comparative group was blood donors presenting to blood bank BVH Bahawalpur during this period.

Exclusion Criteria

Jail employees were excluded from study group. Clinically anaemic, ill and age of less than 18 or more than 50 years were also excluded from control group.

All the cases in study group (2086) as well as control group (9714) were screened for hepatitis B (HBs Ag) and hepatitis C (anti-HCV) infection on serum by One Step Test Device. This test is chromatographic immunoassay for qualitative detection of anti-HCV antibody and HBs Ag in serum (relative sensitivity; 96.8% and relative specificity 99%). All the positive cases were confirmed by Enzyme Linked Immunosorbant Assay (ELISA-3), based on Microparticle Enzyme Immunoassay (MEIA) technology (relative sensitivity; 100% and relative specificity 99.8%).

After an explanation of the purpose, a verbal consent was taken and a questionnaire was filled before taking samples from all the study group cases. On the basis of screening, prisoners were divided into seropositive group and seronegative group. The different variables applied on both the groups were age, sex, occupation, residence, marital status, self shaving / by barber, family history of (H/o) jaundice, H/o blood transfusion, operation, tattooing and body piercing, drug

abuse, same sex / extramarital sex and hepatitis B vaccination status. All information collected was fed and analyzed through computer software SPSS version 10. Different frequencies were calculated in both the groups and were compared for statistical significance. As all the variables were qualitative in nature so Chi-Square test was used to calculate statistical significant if any between the calculated variables. The level of confidence fixed was 95%.

RESULTS

Total prisoners screened were 2086. Out of them 2072 were males (99.3%). Mean age was 34 years. Total seropositive cases (HBS Ag as well as anti-HCV) were 249 (11.9%) While during the same period seropositivity in blood donors (control group) was 5.9%. Total No. of dual positive (HBS+HCV) prisoners were only 5 (0.24%). Comparison of salient features is highlighted in Table 1.

Risk factors analysis among prisoners revealed that drug abuse was significantly associated with seropositivity (27% Vs 12%, p value <0.001). Among drug abusers, very high percentage of intra-venous drug users was positive (89.2%, 25 out of 28). Shaving by barber was also a high risk than self shaving (p value <0.001). H/o operation and rural origin were other significant risk factors. Other risk factors evaluated were not statistically significant. No one was vaccinated for hepatitis B and no body give positive history of same sex / extra-marital sex. Detail of risk factors significance is illustrated in Table 2.

Table 1: Comparison of Salient Features of Prisoners (T = 2086) with Blood Donors (T = 9714).

Features	Prisoner	Blood Donors	P Value
Age range (years)	18-80	18-50	
Mean age (years)	34	26	
Males total	2072	8927	
Males percentage	99.3	91.9	
Females total	14	878	
Females percentage	0.7	8.1	
Total Seropositive cause (B as well as C)	249	580	<0.001
Percentage	11.9	5.9	
HBS Ag +ve total	117	306	<0.001
Percentage	5.6	3.1	
Anti-HCV +ve total	132	274	<0.001
Percentage	6.3	2.8	

DISCUSSION

Our study reveals that seroprevalence of hepatitis is almost double (11.9% Vs 5.9%, P<0.001) in prisoners than in healthy blood donors both for HBV (5.6% Vs 3.1%, P<0.001) as well as HCV (6.3% Vs 2.8%, P<0.001). The high prevalence (HBV; 8.7-68% and HCV; 37-63%) has been reported in other countries like Ireland⁹, Brazil and Japan¹⁰. The main risk factor found in our cases was drug abuse (27% Vs 12%, P<0.001) and especially I/V drug users were at the highest risk (89.2% seropositivity). Very high seropositivity reported in abroad

Table 2: Risk factors significance in prisoners (T=2086).

Variables	Seropositive Group		Seronegative Group		P value
	Total	Percentage	Total	Percentage	
Age					
18-40 years	195	78.4	1402	76.3	>0.50
41-80 years	54	21.6	435	23.7	
Sex males / female	247	99.19	1827	99.5	>0.50
	2	0.81	10	0.5	
Reside rural urban	191	76.7	1285	70	<0.02
	58	28.3	552	30	
Occupation farmers laborers miscellaneous*	131	52.6	990	53.8	>0.10
	82	32.9	610	32.2	
	36	14.4	237	12.9	
Marital status married un-married	178	71.5	1270	69	>0.10
	71	28.5	567	31	
Shaving barber self	160	64.2	955	52	<0.001
	89	35.8	882	48	
H/o B. T +ve H/o B. T -ve	33	13	275	15	>0.10
	216	87	1562	85	
Tattooing +ve -ve	15	6	128	7	>0.10
	234	94	1709	93	
Operation +ve -ve	10	4	25	1.4	<0.02
	239	96	1812	98.6	
F H/o Hep. +ve	19	7.6	110	6	>0.10
F H/o Hep -ve	230	92.4	1727	94	
Drug abusers non-addict	67	27	221	12	<0.001
	182	73	1616	88	
H/o homosexual / extramarital sex	-	-	-	-	-

Key: Resid = residence, *other occupation were shop keepers, students, teachers, mechanic, tailors and office workers. H/o B.T = history of blood transfusion, F H/o Hep. = Family history of hepatitis, homosex = homosexuality.

abroad prisoners than that of ours, was because of difference in drug users. Only 14% (27% in seropositive and 12% in seronegative prisoners) of our cases were drug abusers whereas in other studies⁹⁻¹¹, 40-76% were drug users, (mostly I/V drugs). High proportion (HBV; 42%, HCV; 64-74.2%) of intravenous drug users have been reported to be seropositive¹²⁻¹³.

The statistically significant other risk factors found in our study were; barber shaving than self shaving (P<0.001), H/o previous surgery (p<0.02) and rural residence (p<0.02). Most of our people, especially rural, are shaved by barber, by tradition. Mostly barbers use the same razor on many persons, that may transmit infection¹⁴. This high risk practice needs to be addressed by health education of barbers as well as general public.

Surgery as a risk has been reported in literature^{8,15}. Persons of rural origin have been found at higher risk in an Iranian study (2% Vs 1.5%)¹⁶. Rurals usually are treated with injectable therapy by quakes, injury prone, poor and illiterate, all associated with high risk¹⁶.

Homosexuality and multiple sexual partners have been reported a risk factor in prison inmates¹¹ but none of our cases volunteered to be indulged in this practice. This negative history may be actual or false, denial secondary to fear of jail authorities and social taboo. Blood transfusion has been reported^{8,17} to be a risk factor, but it was not statistically significant (p>0.10) in our study, probably a few of our cases were transfused. Other factor analyzed, but not found to be statistically

significant ($p > 0.05$), were; sex, age, occupation, marital status, tattooing and family H/o hepatitis.

In conclusion Seroprevalence of hepatitis, both B and C is more in prison inmate than healthy blood donors. Main risk factor in them is drug abuse, especially intravenous. Other significant risk factor is shaving by barber. There in need to make strategy to reduce the risk behavior.

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