

## RISK FACTORS FOR HEPATITIS B AND C AMONG MILITARY RECRUITS

Naila Azam, Nadeem Azam\*, Koukab Javed\*

Army Medical College Rawalpindi, \*Military Hospital Rawalpindi

### ABSTRACT

**Objective:** To determine significant risk factors for hepatitis B and C in young military recruits testing positive during pre enrollment screening.

**Study Design:** Case control analytical study.

**Material and Method:** Healthy male recruits during June -December 2005 at Pathology Laboratory, CMH Malir Cantt.

**Results:** The analysis of risk factors among cases and controls has been categorized into two groups according to source of risk. History of previous therapeutic injection administration during the past 5 years, blood donation and sharing toothbrushes and razors in family revealed results which were significant with  $p$ - value of 0.002, 0.007 and 0.001 respectively. None of the other risk factors assessed in the comparable groups were found to be significant. Other factors considered plausible by other studies for transmission of hepatitis B and C viruses; like tattooing, ever lived in hostel and injection drug abuse showed OR < 1, this suggested insufficient sample size and frame before any suggestion of direction of association.

**Conclusion:** History of injections for therapeutic purposes, blood donation and sharing toothbrushes and razors among family members were the factors which were significant amongst cases.

**Keywords:** HBsAg, Anti HCV, prevalence, risk factors.

### INTRODUCTION

Hepatitis B (HBV) and Hepatitis C virus (HCV) are of serious community health concern in Pakistan. Both infections can lead to an acute or silent course of liver disease progressing from liver impairment to liver failure, cirrhosis of liver, and to hepatocellular carcinoma in a 20-30 year period<sup>1,2</sup>. The diseases like hepatitis B and C occurring in young people are important as they deprive the nation of its work force and hinder all development in social as well as economic sectors of national life by consuming a large proportion of national health budget<sup>3</sup>.

A policy decision taken by World Health Organization (WHO) and National institute of Health (NIH) implies that all the patients should be examined with respect to their risk factors for HCV and HBV<sup>1</sup>. Risk factors are often suggestive, but absolute proof of cause and effect between a risk factor and disease is usually lacking<sup>4</sup>. The

rapid increase in HBV carrier rate is observed solely in children under 5 years of age, and there is continuous increase of HBV infection with age. Awareness of risk factors and vaccination against HBV is likely to reduce HBV infection rate in Pakistan. Unlike HBV, no vaccine is available to prevent HCV infection. Almost 3% of world population has been infected with HCV. The virus spreads through contaminated needle pricks, blood products, perinatal route, with some possibility of sexual transmission<sup>5</sup>. In addition to known routes of transmission of HCV, unidentified routes of transmission probably do exist. Unless more is known about the unidentified routes of transmission and risk factors peculiar to the life style of any community, preventive measure may not be successful.

The aim of this study was to identify risk factors for hepatitis B and C among army recruits testing positive during pre enrollment screening at CMH Malir Cantt during the period of study.

Analysis of risk factors was done with alternate hypothesis that cases testing positive for hepatitis B or C are significantly associated with

**Correspondence:** Col Naila Azam, Dept. of Community Medicine, AM College Rawalpindi.

Email: drnailaazam@yahoo.com

Received: 23 Dec 2008; Accepted: 02 April 2013

commonly recognized risk factors for these diseases as compared to the controls testing negative for these diseases.

## **MATERIALS AND METHODS**

**Subjects:** The study was designed to include a total of 400 of the young men who had applied for recruitment in army as soldiers and had reported for preliminary screening for hepatitis B and C at the pathology laboratory of CMH Malir Cantt. All were from rural or semi urban areas of all the four provinces of Pakistan. They were in the age bracket of 18–20 years with 10 years of formal education in local schools.

The first 200 positive and 200 negative cases of hepatitis B or C were selected as a convenient non-probability sample to be interviewed through a questionnaire after their due consent.

**Apparatus:** An attitude and practice; closed ended study questionnaire was designed by the researcher and pre-tested for evaluation of validity by assessing response from a group of young soldiers employed on guard duties in the hospital. The basic idea was to delineate the presence or absence of the normally suggested and proven risk factors for transmission of Hepatitis B and C among the cases as compared to controls.

The questionnaire, translated into Urdu was administered to both cases and controls. Demographic factors like sex, education, marital status and socioeconomic status were constant in all the candidates. Query about potential risk factors included questions about previous surgery, dental treatment or treatment for any ailment by injectable drugs. Past history of blood transfusion was inquired with a time bracket of last 5 years. Other risk factors considered were those concerning practice of shave at barber shops, or tattooing.

### **Data Management and Analysis**

Data were double entered for verification in Epi- Info and analyzed with SPSS version 11. Cases and controls were compared regarding

exposure status as deduced from the questionnaire response. Univariate Odds Ratio (ORs) and their corresponding 95% confidence intervals (CI) were computed.

The analysis of risk factors was categorized into two groups according to source of risk. These are imposed unintentionally as in exposure at various health care settings; such incidents included history of dental treatment, surgery, therapeutic injection administration, blood transfusion or donation.

The second category of risk factors included various life style attitudes adopted in early life through socially acceptable cultural norms as in sharing razors, miswak or toothbrush amongst family members or availing shaving services at community barber shops.

### **Bias and Ethical Considerations**

Possible bias due to respondents' knowledge of their sero-reactivity status of Hepatitis B or C was circumvented by filling the questionnaire before the results were announced in every batch of candidates, reporting on monthly basis for screening. An equal number of positive and negative reports were assigned form numbers tallying with the questionnaire numbering file of study in hand. Prior consent of respondents was obtained on a separate consent form attached with each questionnaire and signed by each individual.

Permission was obtained from the hospital pathologist for use of laboratory data.

## **RESULTS**

The mean age of recruits was  $18.67 \pm 2.4$  years. As for recruits giving history of previous therapeutic injection administration during the past 5 years, the results were significant with *p*-value of 0.002 and an OR value of 2.53.

The other variable significantly associated with positive hepatitis B or C serology was blood donation. *p*-Value was 0.007 against an OR value of 6.32.

Rest of the variables included history of dental treatment, surgery and blood transfusion. None of these revealed significant results. Results in tabular form are presented in table-1.

**Table-1: Univariate odds ratio (OR) and their 95% confidence interval for health care related risk factors evaluated for possible association with serological evidence of infection with hepatitis B or C.**

Risk factors		Cases(n) 200	Controls(n) 200	p-value	OR	CI (p- value)
Therapeutic injection	Y	44	20	0.002	2.538	1.96-3.09 (0.0016)
	N	156	180			
Dental check up	Y	43	31	0.122	1.493	0.07-1.12 (0.1223)
	N	157	169			
Surgery	Y	5	12	0.083	0.402	0.65-1.45 (0.08)
	N	195	188			
Blood donation	Y	12	2	0.007	6.319	4.81-7.78 (0.0065)
	N	188	198			

Key : OR == Odds Ratio CI == 95% Confidence interval

Cases(n) = number of seropositive recruits. Controls (n)= number of seronegative recruits. Therapeutic injection= positive history of administration of therapeutic injection. Dental Check up = history of dental check up / treatment.

Blood donation= history of blood donation. Surgery= history of surgery during last 5 years.

Y= Yes N= No

**Table-2: Univariate odds ratio and 95% confidence interval for commonly accepted lifestyle risk factors**

Risk factors		Cases n(200)	Controls n(200)	p-value	OR	CI
Shave at barber shop	Y	126	141	0.111	0.712	0.924-2.13
	N	74	59			
Sharing toothbrush/razor	Y	154	97	0.001	3.555	0.183-0.43
	N	46	103			
Tattooing	Y	44	62		0.628	1.017-2.49
	N	156	138	0.041		

Key: OR= odds ratio CI= 95% confidence interval Shave at barber shop= positive history of shave at community barber shop. Sharing toothbrush/razor= positive history of sharing tooth brush or razors with other family members/not caring for separate belongings. Tattooing= history of tattooing on body.

Apart from exposure in health care setting there are three other risk factors for exposure to chronic viral hepatitis. Analysis revealed following results as shown in table 2.

The question about sharing tooth brushes and razors amongst family members revealed positive response from 154 cases and 97 controls. This query as a social habit of personal hygiene revealed significant result with an odds ratio of 3.55 and a *p*-value of 0.001.

While the control group (62) replied in affirmative for tattooing on their body the results for tattooing as a risk factor were insignificant with a *p*-value of 0.041 but an OR value of 0.62. Response to question about having regular shave at community barber shops revealed statistically insignificant results with a *p*-value of 0.111 while the OR value was 0.67.

Statistical analysis of all of these results revealed a mixed response from the two groups. *p*-value for neither was significant to be associated as risk factors for hepatitis B or C in the two groups. None of the controls reported in affirmative

## DISCUSSION

The results of case control study are compared not only with various risk assessment studies but also the common risk factors regarding blood transfusion and surgery are considered to evaluate the results of this study in various respects.

In previous studies in Pakistan, there has been a considerable difference in type of risk factor considered for susceptibility to hepatitis B and C. While western societies considered sexual practices and injection drug users (IDU); our studies focused on haemodialysis and multitransfusion thalassaemic patients as high risk. In this study there is a significant change in risk group composition who were healthy young males with possibly limited experiences in healthcare setups. Though the results in the study were not statistically significant they could be attributed to the usual changing lifestyle and

social trends in the adolescent group in our society.

More controls in the tattoo group revealed a rural tilt in the habit or opportunity for tattooing in less well developed rural setups as compared to urban setups.

The usual iatrogenic risk factors like history of surgery, blood transfusion and donation did not reveal more than 5-12 positive responses in either group. Muhammed et al in a study<sup>6</sup> reported that among accidentally diagnosed Anti HCV positive patients, 100% had history of therapeutic injections, 6.92% had major surgery, 1.06% had blood transfusion, 9.72% had undergone dental procedures and 0.39% had tattoos on their body, while 44.2% reported shaving by barbers in the community.

Assessment of possible risk factors for hepatitis B and C has been attempted by many investigators in medical literature.

Bari et al<sup>7</sup> reported significant association of therapeutic injections in past ten years, daily face and armpit shave by barbers in a study of Anti-HCV positive respondents. Dev et al<sup>8</sup> found that risk factors in Caucasians were IDU, body piercing and tattooing (89%, 47% and 32%) while significant risk factors in South East Asian individuals were injection therapy, dental therapy and surgery (89%, 70% and 38%) respectively. Similarly Nyamathi et al<sup>9</sup> reported in a population of homeless men and women. Their significant risk factors were lifetime injection drug use, with 25 times greater odds of having HCV infection. In another study<sup>10</sup> of high risk population of 437 street youths (14-25 years) with high risk behavior found 45.8% reporting IDU, 56.5% had at least one tattoo and 78.3% had body piercing. Another interesting risk factor likely to be significantly associated with hepatitis C serology was found to be history of repeated acupuncture in a study in rural Korea<sup>11</sup>. This could be equated with injection drug use or community barber services in our rural setup.

### Limitations of the Study

The results in the final analysis of the study revealed significant association in only a few variables tested. Rest of the variables with even  $p$ -value  $< 0.05$ , exhibited an odds ratio of less than 1 which cannot be attributed to it being a protective factor but rather exposed the possible limitation of sampling frame being one of non-probability, individually unmatched study; requiring subsequent follow up with a larger sample size to obtain more precise results.

### CONCLUSIONS

History of injections for therapeutic purposes, blood donation and sharing toothbrushes and razors among family members were the factors which were significant amongst cases.

### REFERENCES

1. Peksin Y, Canbaz S, Leblebicioglu H, Sunbal M, Esen S, Sunter AT. Primary care physicians' approach to diagnosis and treatment of hepatitis B and hepatitis C patients. *BMC Gastroenterology* 2004; 4:3.
2. Tasi JF, Chang WY, Jeng JE, Ho MS, In ZY, Tasi JH. Hepatitis B and C virus infection as risk factors for cirrhosis of liver and cirrhotic hepatocellular carcinoma: a case controlled study, *Liver* 1994; 14:98-102.
3. Pasha O, Luby SP, Khan AJ, Shah SA, Mc Cormick JB, Fisher Hoch SP, et al. Household members of hepatitis C virus infected people in Hafizabad Pakistan. Infection by infections from healthcare providers. *Epidemiol Infect* 1999; 123: 515-8.
4. Mahoney FJ, Update on diagnosis, management and prevention of Hepatitis B virus infection. *Clin Microbiol Rev* 1999; 12(2): 351-66.
5. Robert EA, Yeung L. Maternal - infant transmission of hepatitis C virus infection. *Hepatology* 2002; 36(5 suppl-1):5106-13.
6. Muhammad N, Jan MA. Frequency of Hepatitis C in Buner, NWFP. *JCPSP* 2005; 15(1):11-14.
7. Bari A, Akhtar S, Rahbar HM, Luby SP, Risk factors for hepatitis C virus infection in male adults in Rawalpindi-Islamabad Pakistan, *Trop Med Int Health* 2001; 6(9): 732-38.
8. Dev A, Sundararajan V, Sievert W. Ethnic and cultural determinants risk assessment for hepatitis C acquisition. *Gastroen Hepatol*, 2004; 19: 792-798.
9. Nyamathi AM, Dixon EL, Robbins W, Smith C, Wiley D, Leake B, Longshore D, Gelberg L, Risk factors for hepatitis C virus infection among homeless adults, *JGIM*, 2002; 17.
10. Roy E, Haley N, Leclerc P, Boivin JF, Cedras L, Vincelette J, Risk factors for hepatitis C virus infection among street youths, *CMAJ*. 2001; 165(5).
11. Shin HR, Kim JY, Lee DH, Yoo KY, Lee DS, Franceschi S. Hepatitis Band C virus prevalence in a rural area of South Korea: the role of acupuncture. *Br J of cancer* 2002; 87:314-318.