# FREQUENCY OF HBV INFECTION AND ITS RISK FACTORS IN ASYMPTOMATIC MILITARY PERSONNELS

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## ABSTRACT

***Objective:*** To determine the frequency of silent Hepatitis B virus (HBV) infection, its symptoms and risk factors in apparently healthy military personnel of Pakistan Army.

***Study Design***: Descriptive cross sectional study.

***Place and Duration of Study:*** Department of medicine, Combined Military Hospital Okara from Oct 2012 to Mar 2013.

***Material and Methods:*** A total of 6236 healthy troops with age ranging from 18 to 57 years without previous or present history of HBV infection were selected by consecutive sampling from Okara Garrison. Blood samples were subjected to rapid screening of HBV infection using immunochrom atographic (ICT) kits (Intec ® production, Inc) with sensitivity and specificity of 99.8% and 95 % respectively. All positive cases were confirmed by 4th generation ELISA and PCR for HBV DNA were also sent. All infected cases were given a questionnaire about different risk factors of HBV infection. Finally variables were defined qualitatively and quantitatively and frequency, percentage, mean (SD) were calculated. All the data was analyzed using SPSS version 19.

***Results:*** Age ranged from 18-57 years with mean age of the study group 27 (±7.2) years. Mean age among those with HBs Ag positive was 32 (±7.3) years. Frequency of HBV infection was 2.03% (127 participants out of 6236) whereas PCR for HBV DNA was positive in 51 out of 127 (40.1%). Most common symptom was anorexia in 16 patients (12.6%) followed by fatigue and fever in 15 patients (11.8%) each. While 42 patients (33.1%) were asymptomatic. Dental procedures was found to be most frequent risk factor (25.9%) followed by previous history of surgery (21.2%).

***Conclusion:*** Although pre induction screening of HBV infection is carried out in Pak Army still its prevalence is matched with that of general Pakistani population. Soldiers' education and immediate vaccination is recommended at time of induction to stop the spread of this dreadful disease in Pak army.

**Keywords:** Hepatitis B virus, Military personnel, Risk factors.



## INTRODUCTION

Hepatitis B virus (HBV) infection is a global health problem where 2 billion people have been infected with HBV[1]. Of these about 400 million have become carriers of disease[2]. In accordance with prevalence of HBV in general population[3], world is divided in to three zones; high prevalence zone (>8%), intermediate (2-8%) and low (<2%) prevalence zone. High endemic zone include China, Southeast Asia, most of Africa and parts of South and Central America. Low prevalence zone include developed countries like USA Canada Western Europe and Australia. Rest of the world including Pakistan lies in intermediate prevalence range[4]. It is estimated that 9 million people in Pakistan are infected with HBV[5]. Moreover its prevalence is on rise day by day in pakistan[6]. Different studies report carrier rate of 7-22% with an alarming overall exposure rate of 40-50%[7,8]. Why HBV and other communicable diseases are on the rise in Pakistanis can be answered by lack of education about spread of major communicable diseases

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including HBV, HCV and HIV, scanty health care facilities in rural areas, low socioeconomic state of majority and some social and cultural constrains[9]. There are many risk factors attributable to acquisition of HBV infection in general population. Apart from the most common parental (vertical) transmission HBV infection spread by horizontal transmission through parenteral or per cutaneous contact with infected blood and body fluids[10-12]. Household contacts can transmit hepatitis B through the sharing of razors, blades, towels or tooth brushes because HBV does not lose its infectivity for a week when it come on any surface[12]. As HBV infection is a preventable disease Pakistan Army takes due care in recruitment of soldiers in it. Presently HBV and HCV screening is compulsory before induction and positive individuals are not inducted. Considering this it can be assumed that HBV infection in the soldiers would be much less common than general Pakistani population. Up till now only frequency of HBV and HCV positivity has been estimated in recruits[13]. As recruits come from general population of Pakistan so the frequency of HBV positivity in them would be a mere reflection of HBV prevalence in general population. Our study would be one of the pioneer studies estimating HBV frequency and its risk factors in apparently healthy young serving soldiers of Pakistan Army. Soldiers are vulnerable to get HBV and HCV infection more than general population owing to certain risks more prevalent in their environment. They are prone to injuries and subsequent surgery. Moreover owing to poor oral hygiene there is high incidence of dental treatment/extraction in soldiers. They also live together in large numbers in barracks where there are chances of sharing razors, blades, tooth brushes and towels between them due to poor knowledge about transmission of HBV. As soldiers are sent on leaves after months, there is predisposition that they may get involved in extra marital relations. There is high incidence of cesarean section in army hospitals predisposing the spouses to this virus and subsequently acquisition of HBV infection in soldiers. Keeping in view of above we studied all these risk factors in HBV positive soldiers.

## MATERIAL AND METHODS

This cross sectional study was carried out in department of medicine, Combined Military Hospital Okara, from Oct 2012 to Mar 2013. We included 6236 military personals in age range of 18 years to 57 years by consecutive sampling serving in Okara and surrounding areas. Those known to be suffering from HBV or HCV and those who had already taken antiviral treatment for hepatitis B or C were excluded from study. Informed written consent was taken from each patient and permission from hospital ethical committee was also sought. After that those agreeing to participate in study (100%) were tested for HBsAg. Blood samples of 3 mL were taken from all the participants in a disposable syringe and were subjected to rapid screening using immunochromatographic (ICT) kits (Intec ® production, Inc) with sensitivity and specificity of 99.8% and 95 % respectively. All the positive cases were confirmed by 4th generation ELISA and PCR for HBV DNA was sent to AFIP. HBsAg positive irrespective of their PCR result were considered infected. Finally HBV infected individuals were each given a questionnaire to complete. The questionnaire included questions on age, marital status, history of needle prick, blood transfusion, surgery in last one year, dental treatment in last one year, sharing of razors, tattooing, spouse having hepatitis B, extramarital contacts, vaccination history, intravenous drug abuse, parenteral drug treatment in past, presence of any symptoms. Variables were defined qualitatively and quantitatively and frequency, percentage, mean (SD) were calculated. All the data was analyzed using SPSS version 19.

## RESULTS

Age ranged from 18-57 years with mean age of the study group 27 (±7.2) years. Over all prevalence of HBV infection was 2.03% (127 participants out of 6236). Mean age among those

with HBsAg positive was 32 (±7.3) years. All the responders were male with 94% (5861) below the rank of officers and 6% (375) officers. Out of 127 patients found positive for HBsAg PCR for HBV DNA was positive in 51 (40.1%) remaining 76 (59.9%) were healthy inactive HbsAg carriers. Most common symptom was anorexia in 16 patients (12.6 %) followed by fatigue and fever in 15 patients (11.8%) each, while 42 patients (33.1%) were asymptomatic (table-1). Dental procedures were found to be most frequent risk factor (25.9%) followed by previous history of surgery (21.2%) (table-2). It was noted through questionnaire that only 1.5% (97 out of 6236) individuals were found vaccinated and 78 (81%) of them belonged to officer category.

**Table-1: Clinical presentation of patients found to be HBsAg positive (n=127).**

| Symptoms | Number among positive cases | Percentage (%) |
|---|---|---|
| Anorexia | 16 | 12.6 |
| Fatigue | 15 | 11.8 |
| Fever | 15 | 11.8 |
| Jaundice | 14 | 11 |
| Dyspepsia | 13 | 10.3 |
| Weight loss | 12 | 9.4 |
| Asymptomatic | 42 | 33.1 |

**Table-2: Frequency of HBV risk factors among patients with positive HBsAg (n=127).**

| Risk factors | HbsAg positive | Percentage (%) |
|---|---|---|
| Dental treatment | 33 | 25.9 |
| Past surgery | 27 | 21.2 |
| Needle stick injury | 11 | 8.6 |
| Blood transfusion | 10 | 7.8 |
| Razor sharing | 7 | 5.5 |
| Spouse with HBV | 6 | 4.7 |
| Tattooing | 5 | 3.9 |
| Extra-marital contact | 1 | 0.8 |
| Unknown | 27 | 21.2 |

## DISCUSSION

Transmission of HBV infection in community can be better understood by studying its frequency and associated risk factors of its acquisition. In our study prevalence of HBV infection was 2.03% which is lesser but comparable to overall HBV prevalence in Pakistan which was 3-4%[14] in one study carried out in Karachi. Another study which included healthy donors from all regions of Pakistan concluded an overall prevalence rate of 4% although it varied from region to region as it was 2.9% from Bahawalpur, 2.04% from Lahore, and 2.06% in healthy blood donors in Faisalabad[9]. Another study by Shifa International Hospital Islamabad on 47,538 people gave a prevalence of 2.56% in Pakistani population[15]. Comparatively Lesser frequency in military personals is attributable to pre induction strict screening for HBV in Pak army which filters out all positive cases due to perinatal vertical transmission, child hood horizontal transmission, hemodialysis and inherited transfusion dependant diseases like thalasemia, sickle cell anemia and hemophilia. Nevertheless it is quite higher than expected due to high rate of dental and other surgical procedures in soldiers as well as their living together in barracks predisposing horizontal transmission of HBV among them. In our study 25.9% cases of HBV infection gave a history of dental treatment (tooth extraction / scaling), 21.2%

had previous surgical procedure in last one year, 8.6% had only history of IV/IM injections from quakes and 7.8% had blood transfusion in the past, 5.5% of positive cases gave a history of habitual razor sharing. Four point seven percent of the positive soldiers had their spouses suffering from HBV infection whereas 3.9% had tattoos on their skin. A small study carried out in Social Security Hospital Rawalpindi which included 12 HBV positive subjects besides HCV positive ones in June 2008 revealed 16.7% HBV positive cases due to dental procedures, 8.3% due to past surgery, 83.3% had past exposure to injections, 16.7% had past blood transfusins, 16.7% had tattoos and 25% had extra martial relations[16]. As only 12 subjects were found positive in above mentioned study its results are questionable due to very small sample size as compared to our study. According to another study carried out on 639 HBV positive individuals in Khyber Pakhtunkhwa by Awan et al[17] revealed that only 16.06% had past dental surgery and 9.38% had general surgery meaning that military personals were either more prone to dental problems and surgical issues or surgical instruments were less properly sterilized. In the same study[17] all remaining risk factors prevalence was more or less similar to that of our study. Razor sharing either by ignorance of barbers or by soldiers themselves is an important mode of HBV transmission which is not uncommon in military set up. Barbers in army are usually screened for HBV and HCV infection but they are unaware of modes of spread of these viruses[18]. The similar ignorance of barbers was noted in our study. Consequently almost all of them did not have list of infected individuals nor did they make separate shaving/hair trimming kits for them. Some of them had only one separate kit set apart for all positive cases. Similarly razor sharing among soldiers was found as a normal practice. A study[19] carried out on 200 HBV or HCV positive military recruits along with 200 controls in 2005 in CMH Malir revealed that sharing tooth brushes and razors amongst family members' was present in 154 cases and 97 controls thus observing the same trend of poor personal hygiene as noted in our study. In our study out of total infected 127 individuals, PCR was positive in 40.1% and remaining ones (59.9%) were healthy inactive HBsAg carriers whereas prevalence of inactive HBsAg carrier worldwide is 67% to 80%[20]. Although HBV vaccines are easily available in Pakistan but majority of Pakistani adult population is still not vaccinated. In our study only 1.5% (97 out of 6236) individuals were found vaccinated and 78 (81%) of them belonged to officer category. Similar trend of very low vaccination rate of 1.23% was found in Alam et al study[9]. Such a low rate of vaccination is quite alarming when it is well known fact that HBV is 100 times more infectious than AIDS[21]. Percentage of different symptoms and asymptomatic individuals observed in our study is supported by many national and international studies. Our study had few limitations. Our study was exclusive for male gender. Secondly we did not include occult hepatitis B infection which is defined by the presence of HBV DNA in serum or liver in the absence of HBsAg[22] thus missing few infected cases. Thirdly already known HBV infected cases and previously treated chronic Hepatitis B cases were not included in our study thus study results actually under estimated the burden of HBV in armed forces. Fourthly questionnaire about different risk factors was not given to non-infected study population hence significance of described risk factors is questionable.

## CONCLUSION

Although pre-induction screening of HBV infection is carried out in Pak Army still its prevalence is matched with that of general Pakistani population. The most common risk factors observed in HBV positive individuals were general and dental surgery, unsafe injection and unhygienic barber practice. Soldiers' education through healthcare professionals about the importance of infection control measures by safe injection practices and proper sterilization of medical and dental instruments is very important. Education of barbers and provision of

separate shaving/hair trimming kits for all positive cases is responsibility of administration of the unit. Moreover immediate vaccination is recommended at time of induction to stop the spread of this dreadful disease in Pak army

## CONFLICT OF INTEREST

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

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