A study of seroprevalence of hepatitis B and hepatitis C among troops in Armed Forces

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INTRODUCTION

Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections are the most important cause of liver disease and are posing great challenges especially in developing world. It is estimated that there are about 350 million carriers of HBV and 170 million are affected by HCV worldwide.¹ The overall carrier rate of HBV infection in India is often quoted as being 4.7%.² Little information is available about prevalence and genotype distribution of HCV in general population of India. It is estimated that there are 12.5 million HCV carriers in our country.³

Hepatitis B and its sequelae that occur predominantly in young people pose a high and avoidable economic burden on society. Although over a decade has elapsed since the discovery of HCV, no satisfactory therapy for its management is available.

Most available studies on seroprevalence of hepatitis B and C in the country and Armed Forces have been done on blood donors or certain high risk groups.^{4,5} Hence there was a perceived need to undertake a study on an adequately large and representative sample of army personnel and their dependants, with a view to obtain a picture of frequency and distribution of HBV and HCV in the Armed Forces population.

MATERIALS AND METHOD

The study was carried out amongst troops and families of an infantry division. A community based cross sectional study design was used. The study included a representative sample of population consisting of serving soldiers (both officers and PBOR). Sample size was calculated using Epi info software version 2000. For the study, sample size was calculated for HBV and HCV prevalence calculation. With two tailed alpha

error taken at 5% and expected deviation as 1% for HBV and 0.5% for HCV, a minimum sample size of 1120 for HBV prevalence study and 1521 for HCV prevalence study was obtained. The sample was selected from the study population of army units located in the same station by the method of multistage random sampling.

A detailed questionnaire was developed to study the risk factors for transmission of HBV and HCV infections and was administered to all serving personnel during sample collection.

RESULTS

A total of 1511 samples were collected from serving soldiers and all of these, were tested for HBsAg and anti-HCV.

HBV: Overall point prevalence of HBsAg positivity in serving soldiers was found to be 1.25% (95% CI=0.69%–1.81%).

HCV: Of the 1151 samples tested for anti-HCV, not even one tested positive.

Questionnaire on likely risk factors of HBV infection were administered to 1511 serving soldiers; completed questionnaires were received from 1262 persons and these were used for analysis of results.

Mean age of the responders was 31.3 years with SD of 5.3 (range 19–46 years). Around 97% responders were personnel below officer rank and 95.6% were educated more than primary level (Table 1).

History of having taken injections from civil medical practitioners was observed to be a highly significant risk factor ($P<0.001$) with OR=10.22 (95% CI=3.29–30.68), thus indicating that injections from civil increased the risk of infection by ten times (Table 2). Past history of surgery (OR=5.24), undergoing dental procedure (OR=3.17), habit of sharing razors (OR=9.09) were observed to have increased risk of HBV infection with, however the risk was not statistically significant in the study group.

DISCUSSION

Findings of the study indicate that over all seroprevalence of HBV infection among population of Armed Forces was 1.25%. This is lower than 2.4% calculated as true prevalence in non-tribal

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Table 1 Distribution of study participants) as per age, rank, education, and marital status (total number [n] = 1262).

Age (yr)	Number	Percentage
≤ 30	512	40.6
31–40	691	54.8
≥ 41	59	4.6
Mean: 31.3, SD: 5.3 (Max 46; Min 19)		
Rank		
Officers	37	2.9
JCO	61	4.8
OR	1164	92.2
Education		
Primary	5	0.4
Matriculate	893	70.8
Secondary	302	23.9
Graduate	56	4.4
Postgraduate	6	0.5
Marital status		
Married	996	78.9
Not married	266	21.1

Table 2 Association of history of taking injections from civil practitioners with hepatitis B virus seropositivity.

History of injection in civil	HBsAg		Total (%)
	Positive (%)	Negative (%)	
Yes	6 (9.37)	58 (90.63)	64 (100)
No	12 (1.0)	1186 (99.0)	1198 (100)
Total	18 (1.43)		1262 (100)
	1244 (98.58)		

Odds ratio = 10.22 (95% CI = 3.29–30.68). $\chi^2 = 30.29$; $P = 0$.

populations of India by a meta analysis.² Also another study conducted in Armed Forces has found the seroprevalence to be 7.9%⁴ which is very high in comparison to this study. However, a population based study of Kerala has found the seroprevalence of HBV to be 0.52%⁵ which is lesser than the present study.

Out of 1886 individuals tested for anti-HCV, not even one tested positive. Similar result has been reported by a population based study conducted in Maharashtra where only one out of 1054 samples tested positive.⁶ Many other studies have found varying levels of anti-HCV positivity. One of the studies done in Kerala has found seropositivity of 0.33% among voluntary blood donors and 0.12% among job seekers to Middle East undergoing medical examination at hospitals.⁵

In our study, history of having taken injections from civil medical practitioners was observed to be a highly significant risk factor for HBV infection. Presently, the developed world has clear guidelines regarding injection use and safety; in contrast, developing countries are facing the brunt of risks associated with the use of this technology, which was introduced into their societies during the early 20th century. There is now a popular demand for injections, and an alarming number of unnecessary and unsafe injections are being administered.⁷ Studies have attributed 20–80% of all new hepatitis B infections to unsafe injections, and have also implicated unsafe injections as a major mode of transmission of hepatitis C.⁸ Other studies have highlighted the various risk factors for HBV infection like being older than 20 years of age, poverty, a low level of education, use of reusable glass syringes, being shaved by a community barber, and being born at home.⁹

A study conducted on Armed Forces population has found highly significant association of HBV positivity with having indulged in sex with CSWs and taking injections in civil set up.⁴

CONCLUSION

It is hence concluded that HBV infection in Armed Forces has a low prevalence and HCV infection in this population is very infrequent. Risk factors like taking injections from civil medical practitioners, undergoing surgery, undergoing dental procedures and habit of sharing razors were identified in the study. There is a definite need to further understand the determinants of the infection transmission in Armed Forces setting. Troops must be educated about likely modes of transmission and preventive measures that can be taken. Hence, it is felt that studies on larger sample of Armed Forces population will be required to estimate the seroprevalence of HBV and HCV infections and associated risk factors in order to plan effective interventions.

CONFLICTS OF INTEREST

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