SEROPREVALENCE OF HEPATITIS B AND C IN YOUNG ADULTS SEEKING RECRUITMENT IN ARMED FORCES

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ABSTRACT

Background: Hepatitis B virus (HBV) and hepatitis C virus (HCV) are the commonest causes of chronic liver disease all over the world including Pakistan. According to the Pakistan Armed Forces policy, all the military recruits are now screened for the Hepatitis B surface antigen (HBsAg) and antibodies to Hepatitis C virus (Anti-HCV) before induction. Previous studies have shown a wide variation in the results regarding the prevalence of HBV and HCV infections. We analysed sera of 15550 young adults seeking recruitment in Armed forces for the presence of HBsAg and Anti-HCV.

Materials and Methods: Sera of healthy adult individuals who presented for medical evaluation as prerecruitment criteria in the Punjab Regiment Centre, Mardan, were tested for presence of hepatitis B surface antigen (HBsAg) and anti-hepatitis C virus (Anti-HCV) by rapid method. Positive cases were confirmed by ELISA technique from Armed Forces Institute of Pathology (AFIP) Rawalpindi.

Results: A total of 15550 individuals were examined. Out of these, 504 (3.24%) individuals had positive HBsAg whereas 574 (3.69%) were positive for anti-HCV. Hepatitis B surface antigen and anti-HCV both were found in 49 (0.31%) individuals.

Conclusion: This study which evaluated predominantly healthy young male population, showed a high seroprevalence of anti-HCV than Hepatitis B surface antigen. Although there is downward trend in prevalence of hepatitis B, there is considerable threat of HBV and HCV to our younger population and there is a genuine need for strict adherence to preventive measures.

Keywords: Hepatitis B virus, HBsAg, hepatitis C virus, anti-HCV, prevalence

INTRODUCTION

Hepatitis B is a major public health problem worldwide. Approximately 30% of world's population or about 2 billion persons have serologic evidence of Hepatitis B virus infection [1]. Prevalence of Hepatitis B surface antigen in the general population of Middle East has been reported to be 1.8% [2]. In Pakistan the prevalence of HBV in blood donors has ranged from 2.28% to 5.86% [3,4]. The prevalence of of Hepatitis B surface antigen among young healthy Pakistani adults in studies carried out in a cross section of population has ranged from 3.0% to 3.53% [5-7].

Hepatitis C virus (HCV) infection appears to be endemic in many parts of the world with prevalence of around 3% [8]. Chronic Hepatitis C leading to cirrhosis is frequent and some events in the course of chronic infection may take years [9]. Prevalence of antibodies against the Hepatitis C virus in healthy adult population has varied widely in various locations of the world. The prevalence of anti-HCV in

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Japanese population has ranged from 0.4% in the under-29 age group to 12.0% in the over-70 age group [10]. The Spanish population showed prevalence of 1.6% [11], German population 0.63% [12] and healthy young Italian population of 3.2% in the north to as high as 16.2% in the south [13]. In Pakistan, seroprevalence of HCV has generally been reported from blood donors. The prevalence has ranged from 1.18% in Southern Pakistan to 6.21% in the northern parts in professional paid donors [3,4] and 1-3% in voluntary blood donors [14,15]. The prevalence of Anti- HCV in young healthy Pakistani males has ranged from 2.2 % to 3.3 % [5-7].

A large number of patients with Hepatitis C virus infection are asymptomatic and are only detected upon their evaluation for pre-employment or pre-recruitment physical examination, pre-insurance examination or as a result of their detection at a blood bank for blood donation. Although quite a significant number of these individuals have normal serum alanine aminotransferase (ALT) level, a number of these persons develop significant hepatic histological abnormalities [16]. Even if the individuals have normal ALT, their natural course results in slow progression to liver fibrosis [17]. As prevention of HBV and HCV infection is an important health priority, understanding the epidemiological patterns of the disease are required to reach meaningful conclusions. The purpose of this study was to find out the seroprevalence of HBV and HCV in young individuals seeking recruitment in army.

MATERIALS AND METHODS

This study was carried out at a secondary care hospital (Combined Military Hospital Mardan).It was a prospective study of young males recruited from all over Pakistan.

A total of 15581 young males that were recruited in the Punjab Regiment centre, Mardan over a period of two years (from Aug 2001 to Aug 2003) were referred to the pathology department of our Hospital for HBsAg and Anti-HCV testing. The details regarding age, marital status, history of minor/major surgical operation, dental procedures, history of jaundice and blood transfusion were taken.

Blood was collected aseptically by using disposable syringes. Serum was separated and transferred to plastic tubes and were properly labeled. All the individuals were asymptomatic. The age range was between 16 to 20 years. The individuals were drawn from all over Pakistan predominantly Punjab province. The minimum education standard was 10th grade. The anti-HCV antibody and HBsAg were performed with IDI-IND Diagnostic Inc. (Canada) one-step quick immunoassay technique. All the positive samples were also analysed by third generation ELISA at Armed Forces Institute of Pathology Rawalpindi. None of the individuals refused testing. All recruits were included in the study irrespective of past history of jaundice or blood transfusion but those vaccinated against hepatitis (31 in number) were excluded.

RESULTS

A total of 15550 subjects were examined during the period. There were 504(3.24%) subjects finally declared positive for HBsAg and 574 (3.69%) subjects positive for anti-HCV. Double infection with HBV and HCV was found in 49 (0.31%) individuals (table-1) .62 out of 566 (10.9%) cases found HBsAg positive by rapid method could not be confirmed by ELISA and 76 out of 650 (13.4%) cases found anti -HCV positive by rapid method could not be finally confirmed by ELISA. The positive predictive value by rapid method for HBsAg and anti-HCV as confirmed at AFIP, Rawalpindi was thus 89.1% and 86.6% respectively (table-2).

DISCUSSION

There is a significant variation in the prevalence of HBsAg worldwide. It is infrequent (0.1 to 0.5 %) in normal population in the United States and Western Europe where as the prevalence rate of 5 to 20% has

been reported in Far East and in some tropical countries [18]. Most of the studies done previously till the nineties in Pakistan have been on healthy blood donors. Zuberi et al [19], Hashmi et al [20], Yousuf et al [21], Rehman et al [22] reported HBsAg prevalence

Table-1: HBs Ag and anti-HCV prevalence in young adults seeking recruitment (n = 15550)

Serological Maker	Seropositive	Percentage
HBsAg	504	3.24 %
Anti-HCV	574	3.69%
HBsAg + Anti-HCV	49	0.31%

Table-2: Comparison between rapid method and elisa technique in detection of HBsAg and anti-HCV

Serological Marker	Positive by Rapid Method	Confirmed by ELISA	Positive Predictive Value of Rapid Method
HBsAg	566	504	89.1%
Anti-HCV	650	574	86.6%

Table-3: Comparison of HBs Ag and anti-HCV prevalence in healthy recruits / soldiers in various national studies

Author/Publication Year	Study Group	No studied	HBsAg	Anti HCV
Ahmed et al 1991	Healthy recruits	990	9.97%	-
Ali et al 2002	" "	5371	3.53%	3.29%
Zakria 2003	" "	963	3.2%	2.2%
Farooq 2005	Healthy Soldiers	665	3.0%	3.3%
Ours	Healthy adults seeking recruitment	15550	3.24%	3.69%

of 3.1%, 0.99%, 1.11% and 5% respectively in healthy voluntary blood donors. Zuberi et al and Rehman et al also reported that in health care personnel the prevalence of HBsAg was 2.8% and 5% respectively. The recent studies done in Pakistan on healthy blood donors however show a prevalence rate of up to 5.86% [4].

The prevalence of HBsAg in young healthy Pakistani population in recent studies carried out in Pakistan has ranged from of 3.0 % to 3.5% [5-7]. The present study shows a prevalence rate of 3.24%, which is comparable to the recent studies done in young population. In 1991 it was reported that 9.97% of young military recruits were positive for HBsAg [23] where as in 1997 it was reported from Quetta that 15.9 % of patients admitted in medical ward of Bolan Medical College were positive for HBsAg [24]. This trend shows that prevalence rate of HBsAg appears to be declining. It probably reflects greater awareness and wider acceptance of health care measures and use of disposable syringes.

Table-4: Possible risk factors among HBs Ag and anti-HCV positive cases

Risk Factor	HBsAg Positive n=504	Anti HCV Positive n=574
Major/Minor surgery	37	49
Dental Procedures	40	56
Skin Tattooing	09	13
History of Jaundice (past 5 yrs)	13	16
History of Blood Transfusion	03	09

The prevalence of anti- HCV antibodies has also varied considerably in different regions of the world. In the United States 0.5% of voluntary blood donors and 1.8% of the general population has serologic evidence of hepatitis C infection. Extraordinary high prevalence occurs in certain countries such as Egypt where more than 20 % of the population in some cities is infected [18]. Generally the European population shows lower prevalence of anti- HCV e.g. the Spanish population showed prevalence of

1.6% [11] and German population 0.63% [12] and healthy young Italian population of 3.2% in the north to as high as 16.2% in the south [13].

In Pakistan the seroprevalence of anti HCV on the studies done on the blood donors has been around 5% [3,4]. Our study done on the healthy male population group has revealed the seroprevalence of 3.69%, which is slightly higher than the studies done in Pakistan recently on similar type of population [5-7]. This finding could be attributed to the fact that from 2001 onwards, now all military recruits and cadets are being screened for HBV and HCV before induction. So there is every reason to believe that the new inductees would have a higher prevalence rate compared to the ones already undergoing training or those who have completed one. The comparison of HBsAg and anti-HCV prevalence between few of the previous studies from Pakistan on similar type of population is shown in (table-3).

Previous studies done in Pakistan have shown that the small pox eradication programs conducted in Pakistan from 1964 to 1982 had given rise to an increased occurrence of positive serology for anti-HCV. They were noted to be 15.9% in Lahore and 23.8% in Gujranwala [25]. This also could be attributed to the increased number of injections used in many healthy individuals for minor problems. A study from Karachi revealed that more than 10 injections per year in the previous 10 years were far more likely to be associated with increased occurrence of HCV antibodies [26]. A study from Northern Pakistan had shown that those individuals who had received therapeutic injection in the previous 10 years and also had face and armpit shaved by professional barbers had increased occurrence of positively [27]. Similarly, there has been the question of the role of iatrogenic factors in transmission of hepatitis C. Studies from Southern Italy had shown that individuals who had received salk polio vaccine between 1956 and 1965 by the multiple use of unsafe glass syringes may have contracted HCV [28]. Similar iatrogenic factors have been found in transmission of hepatitis B, which in addition to transfusion of blood and blood product, has been associated with parenteral medication, use of needles, and minor diagnostic procedures [29]. The analysis of few of the risk factors among positive cases of Hepatitis B and C in our study has indicated that dental treatment and procedures, minor and major surgical interventions and skin tattooing might be playing an important role in transmission of these infections. Blood transfusions have become relatively safe as far as HBV is concerned, but is contributing to a significant effect in case of HCV (table-4).

As HCV and HBV are assuming epidemic proportion in our country, we need to address the blood bank practices by appropriate screening of voluntary blood donors, educating patients and health care workers, and limiting the use of therapeutic injections, which may not be adequately sterilized. General education of the public can be very helpful in preventing the spread of HCV and HBV in our population, which already has limited resources for health care.

CONCLUSION

This is a population-based study of young healthy adults. There is decline in the HBsAg carrier rate over the last 15 years. However HCV is emerging as a serious problem. There is need to observe and propagate strict preventive and control measures for HBV and HCV. Stringent aseptic measures should be adopted during surgical and dental procedures to avoid the possible transmission of these viruses. More studies at larger level are required to study the prevalence, modes of transmission and risk factors of these infections.

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