ORIGINAL ARTICLE

PREVALENCE OF HEPATITIS B AND C IN HEALTHY ADULT MALES OF PARAMILITARY PERSONNEL IN PUNJAB

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Background: Global prevalence of Hepatitis B varies from high (>8%) in Africa, Asia and Western Pacific to low (<2%) in Western Europe, North America and Australia. An estimated 180 million people worldwide including 4 million people in USA are infected with HCV. This **c**ross-sectional observational study was carried out at Department of Pathology, Pakistan Rangers (Punjab) Central Hospital, Lahore from March to June 2010 to determine prevalence of HBV and HCV infection among serving asymptomatic healthy adult males of paramilitary force. **Methods:** The healthy adult males from province Punjab serving in Pakistan Rangers Punjab without previous history of known positivity for HBV or HCV infection were included in the study. Demographic data including the district of origin were noted. HBsAg and anti-HCV antibodies were tested by rapid immuno-chromatographic method while positive tests were reconfirmed by enzyme immuno-assay (EIA). **Results:** Out of total 15,793 adults screened for Hepatitis B & C viral infections, 14,027 adults belonged to the province of Punjab. There were 396 (2.82%) adults who were found positive for HBsAg and 511 (3.64%) positive for anti-HCV on screening. Retesting of the positive tests by EIA showed 396 (2.82%) positive for HBsAg, and 440 (3.13%) for anti-HCV respectively. Specificity of immune chromatographic method for HBsAg and anti-HCV calculated taking EIA as gold standard was 100% for HBsAg and 99.5% for anti-HCV while positive predictive value of the immuno-chromatographic methods was 100% for HBsAg and 86.1% for anti-HCV. Highest of prevalence of HBsAg was seen in Rahimyar Khan (7.58%) while high prevalence of anti-HCV was seen in Chiniot (8.9%), Faisalabad (7.2%), Vehari (7.03%), Muzaffargarh (5.95%) and Sheikhupura (5.83%). **Conclusion:** Overall prevalence of HBsAg and anti-HCV is on the decline. The isolated pockets of very high prevalence of HCV infection in the districts of Chiniot, Faisalabad, Vehari, Sheikhupura, Rahimyar Khan, Muzaffargarh, and Okara pose a community health problem with a dire need to adopt strict preventive measures in the medical and social practices with effective public awareness campaigns.

Keywords: HBsAg, Anti-HCV, Hepatitis

INTRODUCTION

Viral hepatitis is the infection of liver caused by hepatotropic viruses (hepatitis A, B, C, D, E, G) and is a major cause of morbidity and mortality.[1] HBV and HCV infections are important for causing chronic hepatitis and being leading causes of cirrhosis and hepatocellular carcinoma. One third of the world population (2 billion people) has been infected with HBV and 400 million people have chronic infection out of which 75% of these live in Asia and Western Pacific rim. Global prevalence of Hepatitis B varies from high (>8%) in Africa, Asia and Western Pacific to low (<2%) in Western Europe, North America and Australia.[1]

An estimated 180 million people worldwide including 4 million people in USA are infected with HCV.[2] HCV is the most common chronic blood borne infection and accounts for almost half of all US patients with chronic liver disease.[1] However, there is decline in the annual incidence of infection from its 1980s peak of over 230,000 new cases/year to current 19,000 cases/year. This decline resulted primarily from a decrease in transfusion associated cases as a result of screening procedures.[1]

Prevalence of HCV is higher (up to 13%) in Africa and Asia while highest (over 15%) in Egypt.[3] The sero-prevalence of HBsAg among healthy adults has been reported to be 3.0–9.9% and anti-HCV 2.2–3.69% in various studies in Pakistan.[4] In one study from Faisalabad the sero-prevalence of HCV has been reported to be as high as 17.7%.[5] In another study the highest prevalence for HCV infection in Punjab was found in Faisalabad.[6]

Both HBV and HCV infections are of serious health concern in Pakistan as they can lead to acute or chronic liver disease with significant reduction of work force and consume a large portion of the health budget.[6,7] A significant percentage of individuals suffering from HCV infection are asymptomatic and are detected only on random check-ups for various purposes. Various parenteral routes of transmission of HBV and HCV have been implicated including sharing of needles, razors, tooth brushes, injections, unscreened blood transfusions, accidental needle-stick injuries in healthcare providers and organs for transplantation from

infected donors[8,9] and almost all of these are operative in our settings as well.

The purpose of this study was to determine the sero-prevalence of HBV and HCV infection among the asymptomatic adult males of a paramilitary force and their demographic data with an aim to offer treatment at an earlier stage of the disease and help prevent further transmission of the disease.

MATERIAL AND METHODS

This study was carried out at department of pathology of Pakistan Rangers (Punjab) Central Hospital Lahore. The healthy adult males belonging to the province of Punjab and serving in Pakistan Rangers Punjab without previous history of known positivity for HBV or HCV infection were included in the study irrespective of age while personnel belonging to other provinces were excluded from the study. The demographic data of their hometown districts along with clinical signs and symptoms were noted for pallor, jaundice and hepatosplenomegaly. The blood samples were collected in gel clot containers and appropriately labelled. HBsAg and Anti HCV antibodies were initially tested by rapid immuno-chromatographic methods (MK Bio) while all the positive samples were retested by Murex enzyme immune assay version 111(HBsAg) and Murex enzyme immune assay version 1V (Anti HCV).

Data was entered in SPSS-11 and statistical analysis was done to determine frequency of descriptive variables. Predictive value model of Galen and Gambino was utilized to calculate sensitivity, specificity, positive predictive values of immuno-chromatographic assay in the diagnosis of HBV and HCV infections taking false positive, false negative, true positive and true negative cases and using enzyme immunoassay as gold standard.

RESULTS

During the study period a total of 15,793 adults were screened for Hepatitis B & C viral infections. Out of these 14,027 adults belonged to the province of Punjab, while 1,450 individuals of Khyber Pakhtunkhwa, 157 from Sindh, 6 from Baluchistan, and 153 from Azad Kashmir were excluded from the study. Maximum number of personnel belonged to Narowal (1,452) followed by Bahawalnagar (845) and Kasur (752). Tables-1, 2 and 3 show the district-wise distribution of personnel with frequency of positive cases of HBsAg and anti-HCV.

Out of the 14,027 adults from the Punjab 396 (2.82%) were found positive for HBsAg and 511 (3.64%) were found positive for anti-HCV on screening by immuno-chromatographic assay. On confirmation by Murex EIA version III (HBsAg) and Murex EIA version IV (anti-HCV), 396 (2.82%) were found positive for HBsAg and 440 (3.13%) were found positive for anti-HCV.

District-wise prevalence of HBsAg varied from 1.17% for Mianwali to 7.58% in Rahimyar Khan (n=211) and that of anti-HCV from 0.0% in Layyah (n=113) to 8.9% in Chiniot (n=101). Other districts with high prevalence for anti-HCV were Faisalabad (7.2%), Vehari (7.03%), Sheikhupura (5.83%), Rahimyar Khan (5.69%), Okara (5.39%) and Muzaffargarh (5.95%). All individuals who tested positive did not have any clinical signs and symptoms of pallor, jaundice or hepato-splenomegaly.

Table-1: District-wise distribution and prevalence of HBV and HCV (n>400) [n (%)]

District	Total	HBsAg	Anti-HCV
Narowal	1452	34 (2.34)	44 (3.03)
Bahawalnagar	845	23 (2.72)	13 (1.54)
Kasur	752	20 (2.66)	15 (1.99)
Faisalabad	694	29 (4.18)	50 (7.2)
Sargodha	636	31 (4.87)	23 (3.65)
Chakwal	628	8 (1.27)	18 (2.87)
Sialkot	627	11 (1.75)	25 (3.99)
Bawalpur	575	11 (1.91)	11 (1.91)
Khushab	561	11 (1.96)	10 (1.78)
Jhang	552	15 (2.72)	7 (1.27)
Okara	538	20 (3.72)	29 (5.39)
Mianwali	514	6 (1.17)	6 (1.17)
Lahore	456	10 (2.19)	17 (3.73)
Jhelum	451	12 (2.66)	10 (2.22)

Table-2: District-wise distribution and prevalence of HBV and HCV (n=200–400) [n (%)]

District	Total	HBsAg	Anti-HCV
Sahiwal	368	7 (1.90)	12 (3.26)
Sheikhupura	360	12 (3.33)	21 (5.83)
Gujranwala	357	8 (2.24)	7(1.96)
Khanewal	339	13 (3.39)	11 (3.24)
Mandi Bahaudddin	316	16 (5.06)	12 (3.80)
Gujrat	299	7 (2.34)	7 (2.34)
Vehari	256	11 (4.30)	18 (7.03)
Toba Tek Singh	244	5 (2.05)	7 (2.87)
Attock	231	7 (3.03)	4 (1.73)
Hafizabad	219	10 (4.57)	8 (3.65)
Rahim Yar Khan	211	16 (7.58)	12 (5.69)
Nankana Sahib	200	6 (3.0)	10 (5.0)

Table-3: District-wise distribution and prevalence of HBV and HCV (n<200) [n (%)]

District	Total	HBsAg	Anti-HCV
Bhakkar	193	5 (2.59)	2 (1.04)
Pak Pattan	195	10 (5.13)	2 (1.03)
Rawalpindi	185	2 (1.08)	3 (1.62)
Multan	178	5 (2.81)	8 (4.49)
Lodhran	133	3 (2.56)	2 (1.50)
Layyah	113	2 (1.77)	0 (0.00)
Chiniot	101	2 (1.98)	9 (8.99)
Muzaffargarh	84	5 (5.95)	5 (5.95)
Dera Ghazi Khan	82	3 (3.66)	2 (2.44)
Rajanpur	82	0	0

The specificity of immuno-chromatographic method for HBsAg and anti-HCV assuming the Murex version III and IV EIAs respectively as gold standard

was 100% and 99.5%. Positive predictive value of the immuno-chromatographic methods was calculated to be 100% for HBsAg and 86.1% for anti-HCV.

DISCUSSION

About 2 million people (one third of world population) have been infected with HBV, out of which 400 million people have chronic infection.[1] An estimated 180 million people worldwide are infected with HCV[2] and 3–4 million get infected every year.[10] Majority of these patient are asymptomatic and pose a great danger to the society and medical professionals in particular.[11]

The global prevalence of chronic Hepatitis B infection varies widely from >8% in Africa, Asia and Western Pacific to 2–7% in Southern and Eastern Europe to <2% in Western Europe, North America and Australia.[1] The sero-prevalence of HBsAg has been reported to be 3.24% in healthy adult male recruits in Pakistan.[4,12] The overall prevalence of 2.82% in this study shows the declining trend in the prevalence of HBsAg or it may be contributed to the filtration of infected people at the time of enrolment. However, in a recent study the prevalence of HBsAg has been reported to be 1.93% from Khyber Pakhtunkhwa.[13] The low prevalence (1.17%) for HBsAg and anti-HCV in Mianwali (n=514) adjoining Khyber Pakhtunkhwa may be due to the similar religious/social practices prevalent in these areas.

In contrast to HBV, HCV is more serious health hazard because 70–85% of those infected with HCV progress to have chronic liver disease while recovery occurs in >90% of those infected with HBV.[1,13]

The prevalence of HCV infection varies throughout the world and has been reported to be highest in Egypt.[14] Mirza *et al*[4] have reported a prevalence of 3.69% for anti-HCV in 15,550 recruits. In another study from Khyber Pakhtunkhwa the prevalence of anti-HCV has been reported to be 3.27%.[13] The seroprevalence of 3.13% for anti-HCV in our study matches the same and shows the overall declining trend in the prevalence of anti-HCV. This may be due to the improved awareness among the masses and better practices in the health profession.

The higher prevalence for anti-HCV in the districts of Faisalabad (7.8%), Vehari (8.37%), Okara (6.13%), and Multan (5.61%) is in line with the previous reported higher prevalence in these districts.[12] Nafees *et al*[5] have reported the prevalence of anti-HCV in males to be 16.45% from Faisalabad.

An important observation is the fact that the major difference in the incidence of both types of infections may be due to the testing of 2 different parameters for the two infections, i.e., antigen for HBV and antibody for HCV. HBsAg is cleared by the majority during the course of time while antibodies persist as evidence of exposure to virus. Technically speaking the test to detect exposure to HBV is the anti-HBc antibody and to detect antigenemia in cases of HCV is PCR.[6]

CONCLUSION

The overall prevalence of HBsAg and anti-HCV is on the decline. The isolated pockets of very high prevalence of HCV infection in the districts of Chiniot, Faisalabad, Vehari, Sheikhupura, Rahimyar Khan, Muzaffargarh, and Okara pose a serious health problem with the need of adoption of strict preventive measures in the medical and social practices and public awareness campaigns to for education of masses for primary prevention.

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