

PREVALENCE OF HEPATITIS B AND C SEROPOSITIVITY IN PATIENTS PRESENTING FOR DENTAL TREATMENT

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ABSTRACT

The objective of this study was to determine the prevalence of hepatitis B and C among the patients who came for dental treatment to Bacha Khan Medical & Dental College, Mardan.

Four hundred patients formed the study group. The blood samples of all these patients were taken in the hospital laboratory and were screened for HBsAg and Anti HCV using immunochromatography (ICT) method. The blood was collected by authorized technician and the sera were separated from the coagulated blood by centrifugation at 5000 rpm (revolution per minute) for 10 minutes at 4°C and stored at -20°C for further use. The HBV screening was based on the detection of antibodies against the related virus in the sera using enzyme immunoassays. HCV test is based on detecting viral specific antibodies in serum samples.

Of 400 patients examined, 180 (45%) were females and 220 (55%) were males. Their ages ranged from 15 to 60 years with a mean age of 33.61±15.41 years. The highest prevalence was found in lab. technicians and drivers (HCV=18% HBS=12%). The prevalence of HCV and HBV was nearly equal (HCV=7.75% and HBV = 7.0%). There was no statistical significant difference in prevalence of HCV and HBV in male and females.

Key Words: Hepatitis B virus, hepatitis C virus, hepatocellular carcinoma.

INTRODUCTION

Hepatitis is known as an infection causing swelling and inflammation of the liver. Its chronic form may lead to cirrhosis or cancer. People, sometimes contact hepatitis with limited or no symptoms but usually it leads to jaundice, anorexia, poor appetite and diarrhea. Causative agents of hepatitis include; alcohol, poison, drugs and autoimmunity but most cases of hepatitis are caused by viruses. Hepatitis B is a major health problem worldwide especially in Asia, Africa, southern Europe and Latin America.¹ Hepatitis B virus is transmitted through blood and blood products, sexual contacts. Intrafamilial transmission is also reported.² The major modes of HCV transmission in Pakistan are use of contaminated needles and instruments in medical

practice, unsafe blood and blood product transfusion, intravenous drug use, face and armpit shaving with unsterilised instruments by barbers, ear and nose piercing, poor personal hygiene habits and treatment (practice by non-qualified people).^{3,4} The single most important cause of HCV transmission in the country is lack of proper screening of the transfusion blood.⁵

Hepatitis B virus (HBV) and hepatitis C virus (HCV) are among the principal causes of severe liver disease, including hepatocellular carcinoma and cirrhosis-related end-stage liver disease. The World Health Organization (WHO) estimates that there are 350 million people with chronic HBV infection and 170 million people with chronic HCV infection worldwide.⁶ Hepatitis B is estimated to result in 563 000 deaths and hepatitis C in 366 000 deaths annually.⁷ Given its large population (165 million) and intermediate to high rates of infection, Pakistan is among the worst afflicted nations.⁷

Estimated prevalence of chronic carrier state of Hepatitis B amongst high-risk groups in Pakistan ranges from 6-12% whereas prevalence of Hepatitis C in the high-risk population is much higher - ranging from 15-25%. Moreover, it has also been estimated that 5% of the general population are chronic carriers of

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Hepatitis C and 3% of general population are chronic carrier of Hepatitis B.⁸

The prevalence of hepatitis varies from country to country, and at times it will also vary among different regions of the same country. The epidemiological estimates by WHO show that the prevalence of hepatitis C is low (<1%) in Australia, Canada and northern Europe, and about 1% in countries of medium endemicity, such as the USA and most of Europe. It is high (>2%) in many countries of Africa, Latin America, Central and South-East Asia. In these countries, prevalence figures between 5% and 10% are frequently reported.⁹

The objective of this study was to determine the prevalence of hepatitis B and C in patients presenting for dental treatment.

METHODOLOGY

This study was conducted in Bacha Khan Medical College/Hospital, Department of Dentistry, Mardan from December 2014 to March 2015. Institutional ethical approval was taken and informed consent was taken from every patient. All the patients who came to dental treatment were included in this study. No restriction was placed based on age and gender to ensure maximum participation. The patients who were already diagnosed HCV and HBV affected were excluded from the study.

A pilot study of 60 cases was conducted. And putting obtained prevalence of 8% (0.08) in NCS PASS 2011 software for sample size for confident intervals for one proportion at 95% Confident interval, the calculated sample size was 400.

The blood samples of all these patients were taken in the hospital laboratory and were screened for HBsAg and Anti HCV using immunochromatography (ICT method). The blood was collected by qualified technician and the sera were separated from the coagulated blood by centrifugation at 5000 rpm (revolution per minute) for 10 minutes at room 4°C and stored at -20°C for further use. The HBV screening was based on the detection of antibodies against the related virus in the sera using enzyme immunoassays. HCV test is based on detecting viral specific antibodies in serum samples. All samples were tested the same day as collected. According to the manufacturers' literature, the relative sensitivity and specificity of HCV and HBV testing kits was 96.8% and 99% respectively. All procedures were carried out with informed consent according to institutional guidelines. Test results were kept strictly confidential and were only conveyed to the participants. Those with a positive test result were given advice on further testing and treatment, and were referred to the nearest government health facility.

All the data were entered in SPSS version 16 and the prevalence and percentage of all variables were calculated. Chi-square test was applied to see difference by gender.

RESULTS

Of 400 total patients examined, 180 (45%) were females and 220 (55%) were males. Their ages ranged from 15 to 60 years with a mean age of 33.61±15.41 years. The details of age distribution are given in Table 1. The highest prevalence was found in lab Technicians and drivers (Table 2). The prevalence of HCV and HBV was nearly equal (HCV=7.75% and HBV = 7.0%) (Table 3). There was no statistical significant difference in prevalence of HCV and HBV in male and females. The details are given in Table 4.

TABLE 1: AGE DISTRIBUTION OF THE PATIENTS

Age (years)	N	%age
15-20	40	10
21-30	165	41.25
31-40	95	23.75
41-50	80	20
51-60	20	5
Total	400	100

TABLE 2: SEROPOSITIVITY OF HCV AND HBV BY OCCUPATION OF PATIENTS

Occupation of patient	No. of patients examined	HCV positive patients		HBS positive patients	
		N	%	N	%
House wives	70	5	7.14	3	4.28
Driver	80	8	10	8	10
Teacher	60	2	3	3	5
Student	100	3	3	4	4
Lab. Technician	50	9	18	6	12
laborer	40	4	10	4	10

TABLE 3: OVERALL PREVALENCE OF HBV AND HCV SEROPOSITIVITY IN PATIENTS

Total patients examined		HCV positive		HBV Positives	
N	%	N	%	N	%
400	100	31	7.75	28	7.0

TABLE 4: PREVALENCE OF HCV AND HBV BY GENDER

Sero positive patients	Male		Female		X ²	P-value
	N	%	N	%		
HCV positive (n=31)	18	8.18	13	7.22	1.237	0.539*
HBV positives (n=28)	17	7.72	11	6.11	1.778	0.655*

*Non-significant

DISCUSSION

There have been studies regarding the prevalence of hepatitis B surface antigen (HBsAg) and anti-hepatitis C antibody (HCVAb). However, the majority of these have reported a variety of rates, depending on their study population, which limits the generalizability of their results to the general population. On the other hand, cultural diversity in the different cities of Pakistan also necessitates the performing separate population-based studies in the various regions. There have been studies^{6,8,10,11} regarding the prevalence of hepatitis B surface antigen (HBsAg) and anti-hepatitis C antibody (HCVAb) in Pakistan. The objective of this study was to determine prevalence of HCV and HBV in patients reporting for dental treatment.

Ansari-Moghaddam et al¹² conducted a study to evaluate the population-based prevalence of HBsAg and HCVAb and their correlates in Zahedan City, Iran using 2587 individuals, using a random and cluster sampling approach from 2008 to 2009. They calculated the prevalence of HBsAg and HCVAb, and evaluated these viral markers for an association with; age, sex and potential risk factors. They reported seroprevalence of HBsAg and HCVAb was 2.5% and 0.5%, respectively. Prevalence of HBsAg increased significantly with age (P value < 0.001), but this was not true for HCVAb (P value = 0.67). No sex dominance was observed in the prevalence of HBsAg (3.2% and 2.2% for males and females, respectively, P value= 0.15) or HCVAb (0.4% and 0.7% for males and females, respectively, P value= 0.27). Prevalence of HCVAb did not differ with respect to any of the potential risk factors. In the current study, only prevalence of HCV and HBV were studied. When compared with the Ansari-Moghaddam's study, the prevalence were higher (HCV=7.75% and HBV=7.0% for combined males and females). Lack of awareness, about vaccination and screening among the individuals in this territory may be the possible reasons.

Contrary to the results of the present study another study on the prevalence of viral hepatitis in

Zahedan was carried out on hemophilic patients in the Zahedan Hemophilia Center and demonstrated a prevalence of 4.9% and 29.6% for HBsAg and HCVAb respectively.¹³ Similar previous studies^{13,14} have also reported mostly higher prevalence rates than ours in thalassemic patients (0.3% for HBsAg and 13.5% and 14.4% for HCVAb), blood donors (16% for HBsAg), pregnant women (6.5% for HBsAg) or barbers (31.4% for HBsAg) in Zahedan. Hemophilic or thalassemic patients who take blood derived products are exposed to a considerably higher risk of infection with hepatitis viruses than the normal population, which may partly explain the discrepancy between these studies and study done in this centre. Blood donors are also not suitable representatives of the general population, since females constitute only about 10% of blood donors.¹⁴

Shahid Jamil⁶ carried out an observational study in population using blood samples of 648 participants and were analysed for the presence of anti HCV antibodies using Immuno-chromatographic method and a knowledge and awareness questionnaire was administered to the participants. Their results showed that 394 (61%) participants were females, while 254 (39%) were males. The overall prevalence of HCV in the study area was recorded as 67 (10.3%). Prevalence among male participants was 30 (11.8%), whereas, that among female participants was 37 (9.4%). Prevalence estimates in Oghi, Shamdhara and Kathai were 10.3%, 11% and 9% respectively. Knowledge and awareness regarding HCV was inadequate among the study population. The overall prevalence is close to the results of current study. However, this study was carried out in hospital setting rather in population.

Ataei et al¹⁷ reported in study using 235 heavy vehicle drivers and co-drivers who were selected by simple sampling method. HBsAg, HBcAb and HCVAb tests were achieved by Elisa method. For the positive HCVAb cases, the RIBA test was provided as a confirmatory test. Among the 68 Trialer drivers and 167 truck drivers studied, 2 individuals were tested positive for HBsAg & HBcAb (0.9%). The prevalence of risk factors did not differ between individuals infected with Hepatitis B and C. In this study ICT method was used for screening the seropositive HCV and HBV. But contrary to ATAIEI's study; the current prevalence is much higher. The difference may be due to lack of awareness, immunization and social problems.

CONCLUSION

The high prevalence of hepatitis B and C in patients reporting for dental treatment put the responsibility on dental professionals for controlling cross-infection and making aware the patients about timely referral to specialists for appropriate care.

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