Original Research Article

Sero-prevalence of Hepatitis B and C virus among patients attending Dental clinics in Kashmir Valley

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Abstract

Introduction: Hepatitis B and C virus (HBV and HCV) infections are considered an occupational risk for dental professionals and other health care workers. It is a risk that includes the possibility of dental personnel getting HBV or HCV infection from an infected patient and the potential transmission of HBV to susceptible patients from infected dental personnel. There is dearth of consensus prevalence data on HBV & HCV infections among patients attending dental clinics in Kashmir Valley, and no prevalence study is available. The aim of this study to detect the presence of HBsAg and HCV antigen, and the relation of it‘s presence with other factors such as gender, age, social status, history of surgical operation and blood transfusion among patients attending dental clinics in Kashmir Valley.

Materials and methods: Serum from 2000 patients who attended Government Dental College and Hospital, Srinagar was screened for detection HBV surface Ag and HCV Ag using the Rapid Card Diagnostic Test (SD Bioline rapid immunochromatographic test for antibody IgG). All rapid test positive samples were further tested at SMHS Hospital, Kaksarai, Srinagar by a third-generation Enzyme linked immune sorbent assay (ELISA). Data was analyzed by SPSS (Statistical Package of Social Science) software program version 16 and the prevalence and percentage of all variables were calculated. Chi-square test was applied to see difference by gender.

Results: The overall sero-prevalence of HBV and HCV among dental patients was 4.4% and 4.3 % respectively. There was no statistical significant difference in prevalence of HCV and HBV in male and females. A high sero-positivity was prevalent in the age group of 51-60 years (12% for HBV and HCV respectively). Most of positive results were observed from District Anantnag especially villages

of Kokernag (77.3 % of total no. of serologically HBV positive cases and 82.6% of total no. of serologically HCV positive cases). There was a significantly high prevalence of dental procedures among cases as compared to controls ($p < 0.001$) for both HBV and HCV results.

Conclusion: The sero frequency of hepatitis B and C is high among Kashmiri patients especially from rural population of South Kashmir attending Government Dental College and Hospital, Srinagar, dental malpractice being major source of cross infection.

Key words

Sero-Prevalence, HBV, HCV, Surface antigen, ELISA, Dental clinics, Kashmir Valley.

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 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 [1]. 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. Hepatitis B is estimated to result in 563000 deaths and hepatitis C in 366000 deaths annually [2].

Hepatitis B and C are one of the major health problems worldwide especially in Asia, Africa, southern Europe and Latin America [3]. Hepatitis B virus is transmitted through blood and blood products, sexual contacts. Intrafamilial transmission is also reported. The major modes of HCV transmission in India 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 especially dental procedures (practice by non-qualified people) [4-6].

Individual seeking dental care may be healthy or suffering from dreadful diseases like hepatitis B and C or may be carriers that cannot be easily identified [6]. Such patient may act as a source for spreading such infection among dental health care workers and other patients in dental clinics. The major route of cross infection in dental surgery is via infection through intact skin or mucosa due to accidents involving sharps or direct inoculation onto cuts and abrasions in the skin [7, 8]. Dental treatment procedures frequently cause bleeding and exposure to infected blood and saliva which are known means of infectious disease transmission. Routine use of barrier techniques such as disposable gloves, disposable syringes, spectacles and of course effective sterilization has been reported to be important in preventing the three routes of transmission (dentist to patient, patient to dentist and patient to patient) in dental clinics [9].

Kashmir valley is one of the places worst hit by Hepatitis B and C infection, already declared as an epidemic by experts. Unfortunately in some villages of Kokernag area like Magam, Sonabarie, Sagam, Zalangam, more than 50% population has tested positive. Similarly many villages have been tested positive in Shopian, Kupwara, Lakdakh, as are some areas in downtown Srinagar. As per survey made by Directorate of Health Services, Kashmir division, dental malpractice done by unqualified dental quacks on patients is an important source of spread of hepatitis B & C in the valley. This as per reports has been due to use of ungloved hands to treat dental problems, contaminated

syringes and unsatisfactory methods of sterilizing instruments [10].

There is no detailed published data on hepatitis B& C infections among patients attending dental clinics in Kashmir and no prevalence study is available. This study is therefore attempt at finding out the prevalence of HBV and HCV infection (using HBsAg and HCV rapid kits) among patients as a marker of infection in those attending the dental clinics in Kashmir Valley. This study also highlights the potential hazards of HBV and HCV to the dental doctors associated health workers as well as to patients attending clinics.

Materials and methods

This was descriptive cross sectional study which had been conducted in Department of Oral Pathology, Government Dental College and Hospital, Srinagar, Jammu and Kashmir during period from January 2012 to December 2016. All the patients referred from different departments of this institution for extractions and other surgical procedures such as diagnostic biopsy prior to oral and maxillofacial surgical procedures were enrolled. No restriction was placed based on age and gender to ensure maximum participation. Data was collected by using direct interviewing questionnaire. Informal consent also was obtained from patients.

Blood samples were collected from 2000 patients, under direct medical supervision by medial vein puncture using 5 ml syringe into plain tube to obtain serum by centrifugation at 5000 rpm for 10 min. Serum was screened for detection HBV surface Ag and HCV Ag using the Rapid Card Diagnostic Test (SD Bioline rapid immunochromatographic test for antibody IgG). All rapid test positive samples were further tested at SMHS Hospital, Kaksarai, Srinagar by a third-generation Enzyme linked immune sorbent assay (ELISA). Data was analyzed by SPSS (Statistical Package of Social Science) software program version 16 and the prevalence and percentage of all variables were calculated. Chi-square test was applied to see difference by gender.

Results

A total of 2000 patients who visited Department of Oral Pathology, Government Dental College and Hospital, Srinagar for serological investigations during the period from January 2012 to December 2016, consented to the study were included, 1100(55%) were males and 900(45%) were females with male: female ratio of 1.2:1 (**Table - 1**). Their ages ranged from 15 to 60 years with a mean age of 33.61±15.41 years (**Table - 2**). The prevalence of HCV and HBV was nearly equal (HCV=86 (4.3%) and HBV = 88 (4.4%) (**Table - 3**).

Table - 1: Gender distribution of patients.

Gender	Frequency	Percentage
Male	1100	55 %
Female	900	45 %

Table - 2: Age distribution of patients.

Age (Years)	Frequency	Percentage
15-20	200	10
21-30	825	41.25
31-40	475	23.75
41-50	400	20
51-60	100	5
Total	2000	100

The highest prevalence was found in health workers and drivers (**Table - 4**). There was no statistical significant difference in prevalence of HCV and HBV in male and females (**Table - 5**). The study group was divided into 5 age groups. A high sero-positivity was prevalent in the age group of 51-60 years (12% for HBV and HCV respectively) (**Table - 6**).

Regarding residence most of patients were from District Srinagar 923 (77.3 % of total no. of patients investigated for serological tests), however most of positive result observed among those who were from District Anantnag

especially villages of Kokernag (77.3 % of total no. of serologically HBV positive cases and 82.6% of total no. of serologically HCV positive cases) (**Table - 7**). Regarding patient's history, the prevalence of injection use both IV and IM was very high. These injections were provided by local chemists. Injection use was not statistically significant for both HBV and HCV results. However, there was a significantly high prevalence of dental procedures among cases as compared to controls ($p < 0.001$) for both HBV and HCV results. There was no history of blood transfusion among cases or controls and no history of IV drug abuse. Study of exposures in clinically confirmed cases of hepatitis B & C revealed that they too had a history of utilization of services from local chemists. In some households, there was history of sharing of razors among men-folk. %. All patients had no history of haemodialysis and organ transplantation (**Table - 8**).

Table - 3: Overall prevalence of HBV and HCV seropositivity in patients.

Total patients examined		**HBV Positives**		**HCV positives**	
N	%	N	%	N	%
2000	100	88	4.4 %	86	4.3 %

Table - 4: Seropositivity of HCV and HBV by occupation of patients.

Occupation of patient	**No. of patients examined**	**HBS positive patients**		**HCV positive patients**	
		N	**%**	**N**	**%**
House wives	350	8	2.3 %	7	2 %
Driver	400	32	8 %	30	7.5 %
Teacher	300	8	2.67 %	9	3 %
Student	500	5	1 %	6	1.2 %
Health workers	250	25	10 %	26	10.4 %
Labourer	200	10	5 %	8	4 %
Total	2000	88	4.4 %	86	4.3 %

Table - 5: Prevalence of HCV and HBV by gender.

Sero positive patients	**Male**		**Female**		**X2**	**P-value**
	N	**%**	**N**	**%**		
HBV positive (n=88)	53	4.8 %	35	3.8 %	1.237	0.539*
HCV positives (n=86)	51	4.6 %	35	3.8 %	1.778	0.655*

*Non-significant

Discussion

Hepatitis B Virus (HBV) infection is a global health problem, with an estimated 400 million being chronic carrier of the virus. Around 1 million die due to the consequences of the infection [11, 12]. There have been studies regarding the prevalence of hepatitis B surface antigen (HBsAg) and anti-hepatitis C antibody (HCVAb) in Kashmir valley. 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 [10]. The objective of this study was to determine prevalence of HCV and HBV in patients reporting for dental treatment. Further, individual seeking dental care may be healthy or suffering from dreadful diseases like hepatitis B and C or may be carriers that cannot

be easily identified. Such patient may act as a source for spreading such infection among dental health care workers and other patients in dental clinics. Hence, another objective of present study was to highlight the potential hazards of HBV and HCV to the dental doctors and other associated health workers as well as to patients attending clinics.

Table - 6: Prevalence of HCV and HBV by age.

Age (Years)	Total no. (n= 2000)	HBV positive (n=88)		HCV positives (n=86)	
		N	%	N	%
15-20	200	16	8 %	16	8 %
21-30	825	20	2.4 %	22	2.7 %
31-40	475	15	3.2 %	12	2.5 %
41-50	400	25	6.3%	24	6 %
51-60	100	12	12 %	12	12 %

Table - 7: Prevalence of HCV and HBV by location.

District	Total no. (n= 2000)	HBV positive (n=88)			HCV positives (n=86)		
		N	% (out of total cases investigated)	% (out of total positive cases)	N	% (out of total cases investigated)	% (out of total positive cases)
Srinagar	923	8	0.86 %	9.1 %	9	0.97 %	10.5 %
Anantnag	535	68	12.7 %	77.3 %	71	13.27 %	82.6 %
Baramullah	407	2	0.5 %	2.3 %	0	0 %	0 %
Shopian	135	10	7.4%	11.3 %	6	4.4%	6.9 %

Table - 8: Distribution of HBV and HCV seropositivity among patients according to their history.

Risk factors	HBV-Results			HCV-Results		
	Cases n=88 (%) (Positive subjects)	Controls n=1812 (%) (Negative subjects)	P - Value	Cases n=86 (%) (Positive subjects)	Controls n=1814 (%) (Negative subjects)	P - Value
Use of injections (IM or IV)	73 (83%)	1514 (83.5%)	0.75	76 (88.3%)	1544 (85.1%)	0.45
History of dental treatment	44 (50%)	544 (30.02%)	<0.001	49 (56.9%)	562 (30.9%)	<0.001
History of Ear/nose piercing (only women)	33 (37.5%)	689 (38.02%)	0.55	26 (30.2%)	609 (33.5%)	0.40
History of Sharing of razors (only men)	48 (54.5%)	997 (55.02%)	0.75	51 (57. 9%)	1121 (61.7%)	0.55
History of blood transfusion	Nil	Nil		Nil	Nil	
History of tattooing	Nil	Nil		Nil	Nil	
History of hepatitis	4(0.45%)	9 (0.5%)	0.75	8 (0.93%)	18 (1%)	0.65

The detectable level of HBs Ag and HCV antigen is varied from region to region and ranged between 5 and 7% in the Kashmiri population. Establishment of vaccination program and well screening in blood banks during the past ten years is expected to reduce the rate of HBV and HCV infection and the carrier pool [10]. As per present study, the sero prevalence of HBV and HCV among dental patients was 4.4% and 4.3 % respectively.

The present study revealed highest prevalence of HBV and HCV infection among health workers and drivers which was not noticed in earlier studies. Since a patient seeking treatment may be healthy, infected or a carrier that cannot be easily identified, henceforth, health workers are at high risk of having infection. As for as higher prevalence of HBV and HCV infection in drivers, the economic considerations in terms of morbidity, loss of work-days and also in terms of expenditure is matter of concern [13].

There was no statistical significant difference in prevalence of HCV and HBV in male and females which is partly in consensus with results of Rehman, et al. [10].

A high sero-positivity was prevalent in the age group of 51-60 years (12% for HBV and HCV respectively). However as per Rehman, et al. (2016) 14.35% were below the age of 15 years and 47 (6%) were below 10 years [10].

Regarding residence most of patients were from District Srinagar 923 (77.3 % of total no. of patients investigated for serological tests). However most of positive result observed among those who were from District Anantnag especially villages of Kokernag (77.3 % of total no. of serologically HBV positive cases and 82.6% of total no. of serologically HCV positive cases) which is partly in consensus with results of Rehman, et al. (2016). Regarding patient‘s history, the prevalence of injection use both IV and IM was very high. These injections were provided by local chemists. Injection use was not statistically significant for both HBV and HCV results. However, there was a significantly high prevalence of dental procedures among cases as compared to controls ($p < 0.001$) for both HBV and HCV results which is partly in consensus with results of Rehman etal (2016) [10]. As for as Kokernag is concerned, numerous unqualified medical practioners especially dental quacks are working in area who do not have any knowledge about science and sterilization/barrier protocols as a result of which there is high chances of cross infection. Furthermore, each dental treatment needs to follow same sterilization protocols as any other minor/major surgical procedures which means more time, equipments, manpower and expenditure. However, in the present scenario dentistry in Kashmir valley especially at primary health centre levels of rural areas is miserable where basic requirement for manpower, equipments which definitely counts towards sterilization protocol and chances of cross infection is far below mark.

Conclusion

The sero frequency of hepatitis B and C is high among Kashmiri patients especially from rural population of South Kashmir attending Government Dental College and Hospital, Srinagar, dental malpractice being major source of cross infection. So there is need to follow certain guideline/ recommendations to prevent these dreadful infections which include [14]:

- All health workers must follow all sterilization protocols like use disposable gloves, syringe etc. for all procedures; all instruments must be autoclaved and used as sets for each patients.
- A pre-operative screening (of all patients being prepared for surgery) for HBV and HCV is recommended as a routine, this is not for stigmatization, but to enable the healthcare givers make adequate preparations and take appropriate preventive measures when managing such patients.
- All dental professionals weather doctor, paramedical staff or dental student need screening for hepatitis B and C.

- There is need of surveillance of hepatitis cases and trace to particular dental clinic for preventive measures.
- There is need of surveillance/check to trace to dental clinics run by quacks for preventive measures.
- To reduce the chances of infection of healthcare givers therefore, all of doctors, dentists, surgeons should be vaccinated against HBV preferably at the start of their careers.
- Considering the dental treatment requirements in Kashmir valley, there is need to improve manpower facility, equipments and machinery gadgets at least in Government institutes at different levels in order to avoid any chances of cross infection of such dreadful infections.

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