

Original Article

Knowledge of risk factors and preventive measures of Hepatitis B and Hepatitis C among Healthcare workers at Bolan Medical Complex Hospital, Quetta.

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Abstract

Background: This study aimed to determine the frequency of adequate knowledge regarding risk factors and preventive measures of Hepatitis B and C among healthcare workers (HCWs) at Bolan Medical Complex Hospital, Quetta.

Methodology: A cross-sectional study of 141 participants was conducted at Bolan Medical Complex Hospital, Quetta, after obtaining approval from the ethical review board of Bolan Medical Complex Hospital, Quetta. The sample size was calculated, keeping the prevalence of adequate knowledge of risk factors and preventive measures of Hepatitis B and Hepatitis C among healthcare workers at 62.5%, the margin of error $d=8%$, and 95% confidence level. The study continued from 1st January to 31st June 2016. All healthcare workers between 25 to 60 years of age, working in a hospital for more than six months, were included in the study. While all the non-consenting participants, those with anti-HCV and HBsAg positive analyzed via ELIZA methods, were kept in the exclusion criteria. The enrolled healthcare workers were interviewed, and knowledge of hepatitis risk factors and preventive measures was assessed using a 10-item structured self-administered questionnaire. The data were analyzed using SPSS version 19.0.

Results: The mean age of the study participants was 33.16 ± 8.31 years. The majority were female (69.50%) and > 40 years old (70.92%). Most of the enrolled healthcare workers were doctors (61.70%). The mean service duration was 7.85 ± 9.10 years. Out of 141 HCWs, 71(50.35%) had adequate knowledge of risk factors and preventive measures for Hepatitis B and C. Doctors had significantly more adequate knowledge than staff nurses (76.05% vs. 23.94%; $p=0.000$). Moreover, those with more formal educational years had significantly adequate knowledge of Hepatitis B and C risk factors and preventive measures than those with lesser educational years ($p<0.05$).

Conclusion: According to the survey findings, there is an adequate level of knowledge among the enrolled HCWs.

Keywords

Chronic Liver Disease, Health Care Workers, Hepatitis B, Hepatitis C, Prevention, Risk Factors.



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Introduction

Dihydrotestosterone (DHT) has an obligatory role in physiological processes. Hepatitis B and C are considered the most common occupational hazard that can be transmitted from patients to healthcare workers or vice versa. Although the chances of transmission from HCWs to patients are low, and only a limited number of cases have been reported^{1,2}, while patients-to-HCW transmission has been known and widely studied, the transmission processes are still not known completely¹. These viral infections are the most common cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma, contributing to high morbidity and mortality rates. According to the World Health Organization (WHO), the global prevalence of hepatitis B in 2019 was 296 million, attributing 820,000 deaths mainly due to cirrhosis and hepatocellular carcinoma³. While Hepatitis C affected 58 million people and caused 290,000 deaths worldwide⁴. In Pakistan, the HBV incidence rate ranges between 1.7%-2.3% and 1.3%-1.84% for HCV^{5,6}. Hepatitis has a wide range of direct and indirect consequences¹. The immediate effects include the treatment costs and pre- and post-exposure preventions, while indirect consequences include premature death, chronic sickness, and time away from work. In HCV and HBV antigen seropositive individuals, the hospitalization risk and length of stay are high, with expensive treatment and still low survival chances¹.

It is known that the risk of acquiring viral hepatitis by health care workers (HCWs) is greater than that in the general population^{7,8} as these HCWs' are more vulnerable to contracting blood-borne infections that may be transmitted through unnecessary injections, the frequent use of non-sterile needles, and improper waste disposal. As per the existing literature, about 3 million HCWs each year encounter percutaneous injuries with sharp instruments that are infected⁹. The prevalence rate of HBV and HCV infection was 13%–17% and 0.8%–0.9%, respectively, which were about potential exposure of surgeons during practice¹⁰. Another study from Pakistan, including 180 medical students, found that more than 85% of them were aware of the risk of transmission of HBV

and HCV. Despite the increased knowledge of HBV and HCV infection, the prevalence of needlestick injury remained high¹¹.

Many surveys revealed that HCWs such as nurses, physicians, medical students, and nursing students receive insufficient and inconsistent infection control training¹². A KAP study involving 369 people from Tehran, Zanjan, and Ahvaz discovered a lack of knowledge about HBV and HCV transmission routes and seroconversion rates¹³, 88.1% of the groups studied were vaccinated, and their knowledge of disease transmission was inadequate. Their awareness of the seroconversion rate after exposure was low; however, their mean scores (out of 100) for concern about HBV and HCV contamination were 69.4 ± 2.1 and 76.3 ± 2.0 , respectively. These findings imply that post-vaccination testing for anti-HBs antigen levels is critical in these populations. Furthermore, they underestimated the infection's post-exposure seroconversion rates. Their findings suggested that post-vaccination anti-HBs antigen testing is critical. Another similar study of HBV and HCV in Pakistan, which included 180 medical students, discovered that more than 85% were aware of the risk of HBV and HCV transmission. Despite increased awareness of HBV and HCV infection, the prevalence of needlestick injury has remained high¹⁴.

The increased knowledge level is associated with female gender, high professional education, and length of professional experience. To reduce the incidence of these infections among healthcare workers, there is a clear need for increased awareness of risk factors and modes of transmission of Hepatitis B and Hepatitis C. Lack of knowledge is the main factor for Hepatitis B and C incidence in healthcare workers. It often leads to missed prevention and treatment opportunities, misinformation, and stigmatization of infected individuals, leading to infection transmission.

However, the present study aimed to assess the frequency of adequate knowledge among healthcare workers regarding risk factors and preventive measures for Hepatitis B and C.

Methodology

A cross-sectional study was conducted at Bolan Medical Complex Hospital, Quetta, for six months from 1st January to 31st June 2016. The sample size of 141 was calculated, keeping the prevalence of adequate knowledge of risk factors and preventive measures of Hepatitis B and Hepatitis C among healthcare workers at 62.5%, the margin of error $d=8\%$, and 95% level of confidence. The ethical approval for the study was obtained from the ethical review board of Bolan Medical Complex Hospital, Quetta [Reference no 2103/107; Dated November 11, 2015] before study initiation.

The study included all those healthcare workers who were willing to provide consent and were between 25 to 60 years of age working in a hospital for more than six months. While all the non-consenting participants, those with anti-HCV and HBsAg positive analyzed via ELIZA methods, were excluded from the study.

In addition to acquiring baseline characteristics, a 10-item structured self-administered questionnaire

was used to obtain the data regarding adequate knowledge of the preventive measures and risk factors for HBV and HCV. Data were analyzed using SPSS version 19.0. Mean and standard deviation were calculated to represent the continuous variables (age and duration of service). The categorical variables (gender, staff category, marital status, educational status, and the outcome variable (adequate knowledge) were expressed in frequencies and percentages. All baseline characteristics were stratified to see their effect on the outcome variable, and a chi-square test was used. While a p-value of $p<0.05$ was considered significant.

Results

Baseline characteristics

In the present study, 141 patients were enrolled after fulfilling the inclusion criteria. The mean age of the study population was 33.16 ± 8.31 years ($70.92\% > 40$ years of age). There were more females than males (69.50%). Most enrolled healthcare workers were doctors (61.70%), and the remaining 38.30% were staff nurses. The mean duration of service was 7.85 ± 9.10 years (Table 1).

Table 1: Demographic characteristics of the enrolled subjects.

Variables	n(%)	
Age	> 40 years	100(70.92)
	< 40 years	41(29.08)
Gender	Male	43(30.95)
	Female	98(69.50)
Marital Status	Single	58(41.13)
	Married	83(58.87)
Staff Category	Doctor	87(61.70)
	Staff Nurse	54(38.30)
Education	Intermediate	57(40.43)
	Graduate	56(39.72)
	Post-Graduate	28(19.86)

Assessment of knowledge of Hepatitis B and C

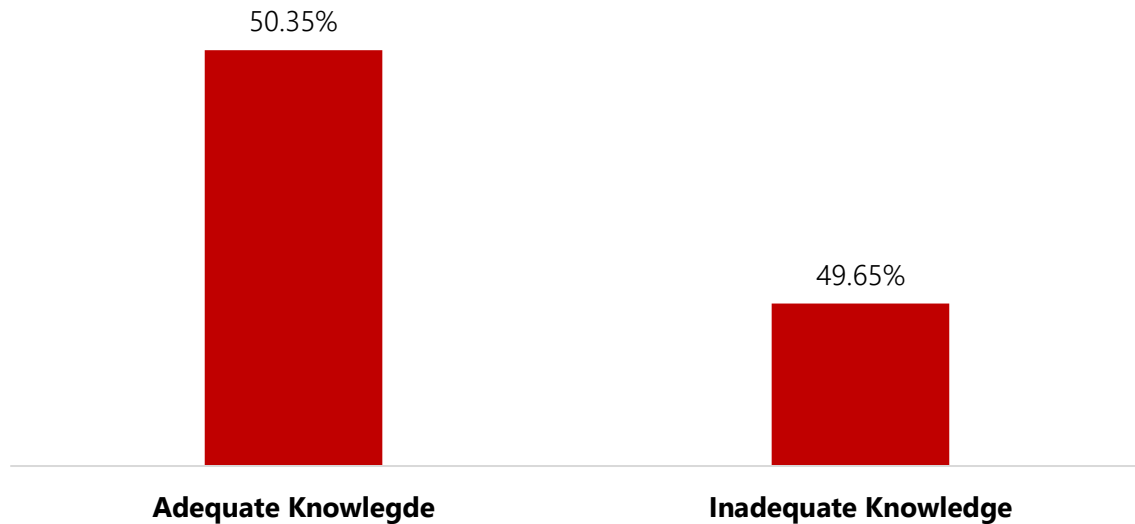


Figure 1: Knowledge regarding the risk factors and preventive measures of Hepatitis B and Hepatitis C among healthcare workers.

It was observed that 50.35% of healthcare workers had adequate knowledge of risk factors and preventive measures for Hepatitis B and Hepatitis C, while 49.65% had inadequate knowledge (Figure 1).

Association between demographic characteristics and hepatitis knowledge of healthcare workers

Staff category and higher educational level were significantly associated with adequate knowledge of risk factors and preventive measures for Hepatitis B and C in HCWs ($p < 0.05$). Staff nurses, compared to doctors, lacked adequate knowledge, i.e., 23.94% vs. 76.05%; $p = 0.000$) (Table 2). Moreover, those with more formal educational years had significantly adequate knowledge of Hepatitis B and C risk factors and preventive measures than those with lesser educational years ($p < 0.05$).

Table 2: Factors affecting the HCW's knowledge concerning Hepatitis B and C.

Variables	Adequate Knowledge		p-value
	Yes (n=71)	No (n=70)	
Age	> 40 years	55(77.46)	0.062
	< 40 years	16(22.53)	
Gender	Male	18(25.35)	0.123
	Female	53(74.64)	
Marital Status	Single	39(54.92)	0.216
	Married	32(45.07)	
Staff Category	Doctor	54(76.05)	<0.01*
	Staff Nurse	17(23.94)	
Education	Intermediate	25(35.21)	0.136
	Graduate	26(36.61)	

Post-Graduate	20(28.16)	8(11.42)	0.011*
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*p<0.05 is considered significant.

Discussion

Hepatitis is a serious public health concern in Pakistan; the major idea towards containment is the provision of adequate knowledge to train healthcare workers to eliminate this viral infection and reduce the overall disease burden. Our study observed that more than 50% of the healthcare providers had adequate knowledge regarding hepatitis risk factors and preventive measures. In contrast, another similar survey from Vietnam, assessing healthcare providers' knowledge regarding modes of transmission and prevention measures, described a notable lack of knowledge among HCWs regarding the prevalence and transmission of Hepatitis B¹⁵. These findings are also consistent with other studies from Vietnam^{16,17}. An Ethiopian study focusing on the attitude, knowledge, and practice of HCWs related to HBV and HCV reported adequate knowledge and positive attitudes toward viral infection and standard precautionary measures. However, the practice of these measures was poor. Hence, the exposure and prevalence of hepatitis were high¹⁸. Moreover, a Syrian study also reported that Mohsen et al. revealed adequate knowledge regarding hepatitis among medical students¹⁹.

As reported earlier, age, gender, and marital status had no significant effect on the level of knowledge among the HCWs. However, staff category and post-graduate qualification were significantly associated with adequate knowledge of risk factors and preventive measures for Hepatitis B and C among HCWs. Yousufzai et al. reported that years of education significantly affect the risk of sharp injuries and subsequent hepatitis infection among healthcare workers²⁰. HCWs with more than ten formal educational years were observed to be less prone to hepatitis C, while they found no significant effect of formal education years on hepatitis B incidence.

It is reported that doctors, compared to nurses or technicians, have better and more advanced

knowledge^{13,21}, which is also apparent from the current findings. A local study from Lahore, including data on the knowledge and attitude of healthcare professionals regarding HBV, reported that the highest mean knowledge scores were observed among doctors, followed by dentists and medical students²². A study from Vietnam reported that hepatitis knowledge is significantly higher among physicians compared to medical students, nurses, assistants, midwives, as well as lab technicians. Moreover, these researchers found no significant effect among the HBV knowledge score with age, gender, work experience, working department, and type of health facility.

Despite the increasing knowledge of occupational exposure, risk factors, and preventive measures, there are high rates of professional injuries and prevalence of hepatitis in the healthcare community, which may be due to sub-optimal precautionary practices or increased workload²³. Similarly, a French study also reported a high level of knowledge among healthcare workers. Unlike Pakistan, they also had suitable preventive equipment and facilities, but only 18.8% followed all standard precautionary measures. Moreover, half of them were never tested for HIV or HCV²⁴. According to a Pakistani study, junior doctors (28.5%) were the most injured, followed by nurses (20.4%). The activity that resulted in the most exposure to blood-borne pathogens was blood collection¹⁰. Another study in India found that a large percentage of HCWs had at least one needle stick injury (NSI) during their career. The average number of NSIs per HCW was 3.85; fatigue was cited as the most common cause of injury by more than half of the workers. Injuries occurred frequently (34.0%) during recapping. The majority of the injured staff (60.9%) washed the injury site with soap and water immediately after the NSI, but 14.8% did not. After one and a half years of follow-up, all study participants were seronegative for hepatitis B surface antigen and had all received prophylactic hepatitis B vaccination²⁵. Another French study that assessed the availability of

proper equipment to prevent transmission in the operating room found that, despite recent awareness about occupational exposure, NSI rates among HCWs in France remained high. During all procedures, less than one-fifth of HCWs (18.8%) wore double gloves and changed their gloves after one hour. Although blunt-tipped suture needles were available in 49.1% of operating rooms, they were never used by 55.3% of HCWs. More than half of the surgeons had never tested positive for the HIV and hepatitis C viruses²⁴.

Limitations & Recommendations

Hence, the study suggests that healthcare workers must be provided with educational & training programs. They must be assisted with preventive facilities, i.e., pre-and post-exposure prophylaxis for needle stick injuries and mandatory immunization before exposure to clinical practice. Despite the strengths, certain limitations in the present study need consideration. Firstly, the questionnaire was self-administered, and the answers were directly obtained from the healthcare worker that could not be validated. Moreover, the sample size was small and limited to a single geographical area; hence, the results cannot be generalized for other settings in Pakistan as the knowledge, attitude, and practice might greatly vary.

Conclusion

Our research found that the overall knowledge of healthcare staff and workers regarding the risk of injuries due to needlesticks, clinical procedures, and the use of preventive measures is adequate. Moreover, observing the high-risk injuries and prevalence of the disease among healthcare workers, we recommend that occupational health services be established in hospitals to improve the working conditions, along with programs regarding streamlining infection control measures, better training staff, and mandating hepatitis B virus vaccination for hospital employees.

Conflicts of Interest

The authors have no conflicts of interest.

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