



Assessment of Knowledge, Attitude, and Practices Towards Occupational Injuries Infections of Healthcare Workers at Tertiary Care Hospital
Poonam Gupta¹, Partha Rakshit², Ravi Kumar Gupta³, Namrata Bhatt¹, Renu Dutta¹, and Sherwal BL^{4*}

¹ Lady Hardinge Medical College, New Delhi, India

² National Center for Disease Control, New Delhi, India

³ Central Research Institute, Kasauli, Solan, Himachal Pradesh, India

⁴ Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India

*Corresponding e-mail: sherwal_lhmc@yahoo.com

ABSTRACT

Background: Healthcare workers (HCWs) deliver their duties at greater risk of occupationally acquired viral infections such as HIV, hepatitis B and hepatitis C, which transmit by direct exposure either with the infected sharps or the body fluids. However, most of such incidents remains unreported and hence pose a high risk to HCWs life. **Aim:** The timely investigation and interventions can change the fate of infection. In the present study, the knowledge, approach, awareness, and actions need to be taken post exposure were assessed among different categories of HCWs. **Methods and materials:** A cross sectional self-structured and responsive questionnaire was provided to HCWs and who furnished all information were included in analysis. **Results and conclusions:** Out of 138 questionnaires evaluated who acquired injury, 61 were resident doctors, 42 interns, 27 nursing staff, 8 were other paramedical staff. Only 19.6% HCWs have completed hepatitis B vaccination and maximum (93.5%) have post exposure prophylaxis for less than 24 h. Post exposure, only 42% HCWs reported to HIV screening center. After injury, spirit application and squeezing was done by 44.2% HCWs. 24% HCWs did not followed the universal precautions at work and 38.4% showed ignorance towards standard precautions. The results indicate ignorance and casual approach towards the universal precautions after occupational injuries which might be due to overworked or lack of resources/awareness. It necessitates the continuous education, monitoring, training, and disciplinary measures to control occupation infection hazards to HCWs.

Keywords: HIV, healthcare workers, needle stick injuries, occupation infection risk

INTRODUCTION

In hospital settings, injuries due to needles or sharps pose a great risk towards occupational transmission of blood infections to healthcare workers (HCWs). These injuries are usually caused by hypodermic needles, blood collection needles, intravenous cannulas, etc. during use, recapping, transferring samples, post procedure cleaning, or disposal in non-puncture proof containers. Hence, HCWs are prone to acquisition of multiple pathogens, such as HIV/AIDS, hepatitis B and C, malaria, herpes, tuberculosis, brucellosis, spotted fever, and syphilis etc. [1]. Although, the occupational injuries can transfer any pathogen (Bacteria, Protozoa, Viruses etc.) but the transmission of the hepatitis B, hepatitis C and the HIV is most important and critical. Any such occupation injury infection costs approximately \$3000 to health system in addition to anxiety and disquiet to the affected person. More than 20 blood pathogens have been categorized as transferable through needle or sharps injury containing hepatitis B, hepatitis C and HIV as most common [2]. According to WHO, approximately 66000 HBV, 16000 HCV and 200-5000 HIV accidental infections occurs to HCWs each year [2-5]. Needless to say, that these infections have serious outcomes in shape of long-term illness, disability and death [2]. Further, these numbers are just indicative since a large number of such occupational infections left unnoticed or unreported.

HCWs usually came in contact with mucus membranes, non-intact skin, blood or other body fluids of an infected person and may acquire infection due to occupational injuries. Various national and international healthcare programs such as HIV/AIDS, tuberculosis, malaria etc. keep continuing to cure these infections from already infected and to aware others about these infections to reduce the infection rate [1,3,6,7]. The HCWs therefore need to work under multiple pressures where patient care, mankind welfare and self-care goes simultaneously. This probably may be one of reasons for occupational injuries and infections. Moreover, in developing countries such as India, social status such as poverty, illiteracy, poor health, HCW: patients' ratio, limited resources further add up as daunting challenge to control infections such as HIV [8].

The rate of occupationally acquired infections is significantly higher than those currently projected or reported. The non-reporting or low injury rate should not be termed as a nonexistent crisis. The studies related with the occupational injuries and associated infections are therefore warranted to strengthen the healthcare management system [9-11]. Further, it has been recommended that post exposure prophylaxis (PEP) should have been initiated within 2 h of occupational injuries. It has been recommended that prophylaxis should be continued for at least 4 weeks [3,4,12,13]. However, due to non-or under reporting, the true significance and impact is always underscored. Moreover, there is a paucity of literature on the same. In the present study, HCWs of a tertiary care hospital were assessed for their knowledge and incidence of occupational injuries and status of post exposure prophylaxis taken. Possibilities were explored for the prevention of such incidents through improvements in knowledge, attitude, and risk perceptions.

MATERIALS AND METHODS

Subjects

HCWs including resident doctors, doctors on training, nursing staff, medical students and other paramedical/supporting staff working in various clinical departments of Lady Hardinge Medical College, New Delhi were approached. The study protocol was approved by Institute Ethics Committee. The subjects were given a cross sectional, descriptive, structured anonymous questionnaire. The questionnaire data was collected for the injuries and general awareness about post exposure prophylaxis. A total of 138 HCWs having history of present or past injuries through blood or body fluids were included in the result analysis. No personal data was collected. Participants were advised to provide their responses to the questions given in questionnaire as given in Table 1.

Table 1 Self responsive questionnaire showing the type of information collected from participants for the status and awareness of occupational injuries

Questions	Self-responsive options				
	Resident	Intern	Nursing	Other's	Student
Type of Health Care Worker	Resident	Intern	Nursing	Other's	Student
Personal protective used	Gloves	Mask	Gloves and glasses	Shoe cover	None
If not used why?	Not available	Ignorance	overworked	-	-
Type of injury/exposure	Solid needle	Hollow	Blade	Splash	Cannula
Procedure causing exposure/injury	Sampling	Injection	Recapping	Suturing	Other procedures
Extent of exposure/injury	Scratch/no blood	Penetrating/ blood	Scratch/blood	-	-
Immediate action taken	Water wash	Squeezed	Spirit swab	Both	None
Awareness about PEP	Yes	No	-	-	-
PEP taken?	Yes	No	-	-	-
If not taken; why?	Source negative	Ignorance	Overworked	No drugs	Fear
Time gap b/w exposure and PEP:	<2 h	2-6 h	<24 h	>24 h	-
Duration of PEP and regimen	Negative till report	<1 d	<7 d	<28 d	Just started
Awareness of Nodal Officers for PEP	Yes	No	-	-	-
Post exposure ICTC visit within	<24 h	>24 h	No visit	-	-
If not; why	Snag	Ignorance	Tested in private lab	Overworked	-
Counselling done for	HCW-Yes/No	Source- Yes/No	-	-	-
Contacted for retesting	Yes	No	-	-	-
Hep-B vaccination	Complete course	Ignorance	Deliberately	Partial	Not taken

Anti HBs Ag Titer done	Yes	No	-	-	-
Source tested for HIV	Yes	No	-	-	-
Source tested for Hep-B	Yes	No	-	-	-
Source tested for HCV	Yes	No	-	-	-
Source status confirmation	Verbally	Inhouse lab report	Private lab report	Not taken	Ignorance
History of past exposure	Needle	Splash	Blade	Cannula	Multiple
Post exposure ICTC visit	<2 h	2-24 h	>24 h	None	-
Bio-Medical Waste Management awareness	Yes	No	-	-	-

RESULTS

Out of 61 resident doctors with occupational injuries, 51 had needle stick injuries while 10 have splashes of patient body fluids on face and hands. Only 36% of them have completed Hepatitis B vaccination and 91.8% had post exposure prophylaxis of less than 7 days. Only 57.4% visited the integrated counselling and treatment centre (ICTC) for HIV screening. Among 42 Intern doctors who have been exposed to occupation injuries, only 11.9% had completed the hepatitis B vaccination. 88% of intern doctors had PEP for less than 7 days and only 45.2% visited the ICTC. Nursing staff also showed similar trends where 96.3% had PEP for less than 7 days and only 7.4% visited the ICTC for HIV screening. Among students and other healthcare staff, 100% took the PEP but for less than 7 days and only 20% and 33.3% visited the ICTC for HIV screening (Table 2). Majority of them have occupational needle stick injuries. Splashed were reported to have over face and eyes. Some participants were recapping needles most of times. 85.7% of participants were vaccinated for hepatitis B. 44.2% didn't know if they were responders to hepatitis B vaccine or not. Most of them didn't report the needle stick injuries. In majorities of incidents source patient was not tested for blood born infections. Many of participants were not aware of post exposure prophylactic measures to be taken if there is an occupational exposure to the blood of HIV positive patient. Awareness that drugs for post exposure prophylaxis are to be started immediately was low (36%).

Table 2 Result of occupational injuries and post exposure prophylaxis action taken as reported by healthcare workers in cross sectional self-responsive questionnaire

Sr. No.	Important phenomenon	Type of Healthcare workers				
		Resident (n=61)	Intern (n=42)	Nursing staff (n=27)	Student (n=5)	Other's (n=3)
1	Injury episodes	51	38	25	5	2
2	Splash episodes	10	4	2	0	1
3	Hepatitis B vaccination (complete with booster)	22	5	0	0	0
4	Hepatitis B vaccination (Incomplete/no vaccine)	39	37	27	5	3
5	PEP taken within 24 h	57	38	26	5	3
6	PEP duration for <7 days	56	37	26	5	3
7	BMWM awareness	55	0	13	0	3
8	Post exposure ICTC visit	35	19	2	1	1

DISCUSSION

It is a general perception that healthcare industry is clean and hazard free. However, the risk of hazard in healthcare could be life ending as the hazardous categories exist throughout the healthcare settings. Therefore, the accurate assessment of the problem and effective policy is needed to look into the factors contributing to increase in occupational injuries and their management [10,11]. Nearly 2 million injuries occurred each year to people working in healthcare sector resulting in occupational health hazard in terms of hepatitis B/C and HIV infections. According to a WHO report, the worldwide burden of occupation exposures is nearly 40% to that of hepatitis B/C and 2.5% of HIV infections. The rate of occupational exposure and injuries are higher in the developing world than those occur in the United States and Europe [3,4,14]. Hepatitis C (HCV) and HIV are the most serious out of the 20 blood-borne pathogens that healthcare workers are exposed to in their daily work. Hepatitis B virus (HBV) is the most common blood borne pathogen and the only one of the three serious viral infections for which a prophylaxis exists. Syphilis, malaria, and herpes are other infections which may transmit through needle stick injuries [1,15].

In the present study, the overall knowledge, attitude and approach of HCWs working in a teaching hospital were assessed for occupational injuries. For this, students pursuing medical degree, doctors on training, nursing staff and other supporting staff were included. Response of a total of 138 HCWs to a cross sectional, self-structured, anonymous questionnaire were analysed. The results indicated that most of the HCWs were casual and non-serious about the consequences of occupation injuries. Less than 50% of HCWs had completed hepatitis B vaccination and post exposure prophylaxis treatment. The ignorance towards screening and PEP treatment may be due to high work load, social stigma, or fear to have the infections. The similar results have also been reported previously in a cross sectional study among 344 HCWs and observed that only 50.2% HCWs reported the occupational injuries [13]. Wicker, et al. reported that 34.1% HCWs staff had needle stick injuries and amongst them, reporting varied from 18.7% to 46.9% depending upon medical discipline involved [16]. They further documented that rate of needle stick injuries is quite high in routine hospital and the injury rate varied according to medical discipline. A study reviewed the few studies available on reporting of occupational injuries health risks and observed that needle stick injuries are omnipresent. It was suggested that safeguard interventions and education training programs should be conducted on regular basis so as to reduce the rate of occupational injuries [9]. The result of the present study also highlights misconceptions, negative attitude, and risk perceptions towards HIV/AIDS of HCWs. It was indicated that HCW were poorly equipped with knowledge and management of occupational injuries hazards and hence necessitate the special attention to overcome this issue.

HCWs are at most risk to the occupational hazard exposure by needle stick injuries, which may occur during different procedures as sampling, suturing, inserting i.v. cannulas, and/or waste disposal. In addition to this, HCWs may expose to patient blood or body fluids splash. In a study carried out in Mongolia, it was observed that needle stick injuries are a common health problem and adequate working conditions are required to reduce the risk associated with occupational injuries. Further, to eliminate the same, adherence to universal precautions are important since all these occupational injuries risk to occurrence of life threatening infections [17]. Therefore, attention need to pay to causal factors and the circumstances under which these occur to explore the possibilities for the prevention of such incidents by improvements in knowledge, attitude, and practices.

The incidence of such injuries is certainly higher than the current estimates. It was documented that all occupational needle stick injuries are not reported and the rate and quantum of these injuries are quite high [10,15]. It has been observed that the rate of occupational injuries is high in routine hospitals [16]. Moreover, the rate also varies according to medical discipline, adherence to universal precautions, training, and education [8,16]. Therefore, as a universal precautions and management, easy and immediate availability of PEP is required.

PEP becomes of much significance in case of HIV where PEP has been one of the most important key to fight discrimination between HIV and AIDS patients [1,17]. Immediate access of PEP goes a long way in recuperate the concerns in the mind of HCWs who work day and night for the benefit of patients. The present study highlights the lack of awareness about post exposure prophylaxis measures amongst HCWs. Moreover, many HCWs were also not aware if they were responders to hepatitis B vaccine or not. In most of the needle stick injuries, cases were neither reported nor investigated for probable infection transmittance. Though, the majority of exposures occur with the source test negative for HBV, HCV, and HIV but nevertheless it indicates a breakdown in protocol and prevention. The risk to acquire infection after a single injury mainly depends upon the patient infection status [18,19]. It has been demonstrated that hollow-bore needle or needle with blood and deep penetration, especially from critically ill patients carried the increased risk for HIV infection [3,20,21]. In this regard, a study was carried out in Sweden to assess the cost of safety devices for occupational injuries to diagnosis and treatment cost after occupational injuries. It was documented that cost of putting safety devices to prevent occupational injuries was less than that of financial burden increase due to investigation and treatment cost incurred after occupational injuries. It was indicated that rate of such incidents can be decreased with proper safety devices in place, continued education and training programs and awareness among HCWs [7,10,13,22].

CONCLUSION

The results of the present study indicate that all HCWs are at risk from occupational needle and sharps injuries. The various other studies have also identified this problem and stressed on development of universal prevention programs [3,4,23,24]. However, the major problem remains to be non-reporting of such accidents, which in tune result in considering this issue as non-significant. Therefore, it is important that the true risk assessment, its elimination, adequate training, and awareness about sharps injuries should be in regular practice and more studies should be

conducted to ascertain the true causes and policy design to cure the same. Since HCWs are at greater risk of acquiring infections while delivering healthcare, there is a need to develop a safe working environment for their safety too. It is of utmost importance that universal precautions are adhered and followed stringently in all healthcare settings. Moreover, continuing education and training and support such as PEP should be available easily and immediately to fight transmittance of blood borne infections such as hepatitis and HIV.

CONFLICT OF INTEREST

Author declares no conflict of interests.

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