



Prevalence, awareness, attitude and vaccination status to sharp injuries among healthcare workers in COVID 19 pandemic Era

Prerna Mahajan^{1*}, Madhur Jain²

¹. Department of Pathology, University College of Medical Sciences and GTB hospital, Dilshad Garden, Delhi

². Department of Cardiology, ESIC Medical College & Hospital, Faridabad, Haryana

***Corresponding Author:**

Dr. Prerna Mahajan

Department of Pathology, University College of Medical Sciences and GTB hospital, Dilshad Garden, Delhi - 110095

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

ABSTRACT

INTRODUCTION:

Many health care workers are at risk of accidental sharp injuries particularly needle stick injuries (NSI) and these are major cause of blood borne infections transmitted among health care personnel. Most of these remain unreported. Relevance of these injuries has increased in this COVID 19 pandemic era as it is clear, without collecting data that health care workers, are at high risk on a daily basis.

Method:

Study Design: Cross-sectional study among Health care workers (HCWs). Setting: a tertiary care hospital in capital city of India. 529 health care workers were included in the study. A semi- structured questionnaire was used to collect data from the participants.

Results:

31% HCWs ever had accidental sharp injuries in their lifetime. Episodes of sharp injuries were significantly lower ($P < 0.0005$) in staff nurses as compared to other category of HCWs. Awareness regarding how to avoid sharp injuries, action needs to be taken after sharp injuries, need to report, and proper follow up, need for PEP (if indicated) was very good. Majority (71%) already had Hepatitis B vaccination. Doctors and lab technicians had statistically significant higher while GDAs and house keepers were the groups with lower percentages of vaccination.

Conclusion: Prevention of accidental sharp injuries is an integral part of prevention programs in the work place issues requiring attention include proper disposal of sharp waste, establishing an individual sharp injuries' protocol, making positive working ambience and supportive attitude towards HCWs who get accidental sharp injuries especially in this COVID 19 pandemic era. The education and training programs should be a periodically regular activity as specific training and prevention are more important than mere guidelines and protocols in preventing accidental sharp injuries particularly needle stick injuries.

Keywords: Prevalence; Awareness; Vaccination status; accidental sharp injuries; Needle-stick injuries (NSI); Health Care workers (HCW)

INTRODUCTION

Sharp injuries particularly needle stick injuries are the most common health care worker issues, because of the environment in which they work. Relevance of these injuries has increased in this COVID 19 pandemic era as it is clear, without collecting data that health care workers, are at high risk on a daily basis. As a result, these workers are at increased risk of occupational acquisition of blood borne pathogens such as HIV, hepatitis B and C, and other diseases. The average risk of transmission of HIV to a health

care worker after percutaneous exposure to HIV-infected blood has been estimated as 3 in 1000.(1,2) According to a WHO study, the annual estimated proportions of health-care workers (HCW) exposed to blood-borne pathogens globally were 2.6% for HCV, 5.9% for HBV, and 0.5% for HIV, corresponding to about 16,000 HCV infections and 66,000 HBV infections in HCW worldwide.(3) At least 1,000 health care workers are estimated to contract serious infections annually from needle stick

and sharps injuries (International Health Care Worker Safety Center, 1999). The CDC estimates that 5.6 million workers in the health care industry and related occupations are at risk of occupational exposure to blood borne pathogens, including HIV, HBV, HCV and others.(4) These injuries not only potentiate health consequences but also cause emotional distress in health care workers which results in missed workdays and directly affects the health care services and resources. As it is one of the important occupational hazards in medical community, and despite its serious consequences, it may remain neglected and most of them under-reported. These needle stick injuries among health care workers are preventable through implementation of strict universal precaution methods, immunization against Hepatitis B, provision of personal protective measures and the management of exposures. In India, the data about occupational exposure to needle stick injuries is scarce. The present study addresses the important issues of NSI and aims to determine the prevalence, awareness, attitude and vaccination status among healthcare workers to needle stick injuries in a tertiary care hospital.

METHODS

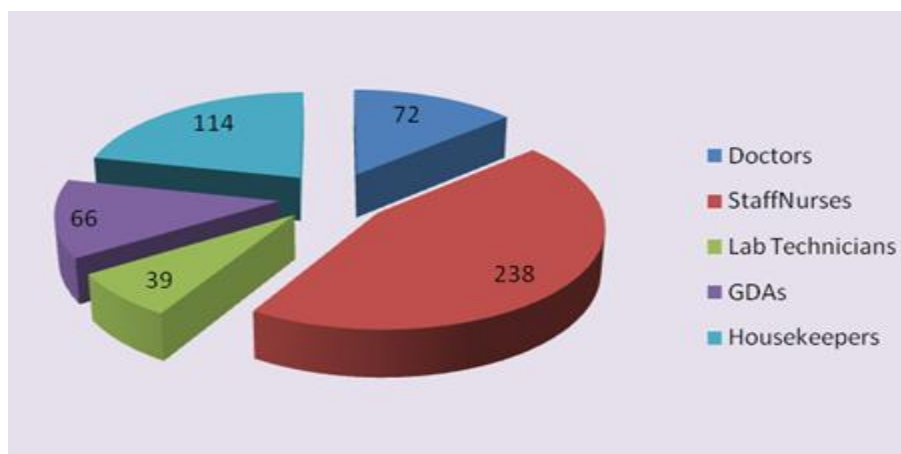
This study was carried out among health care workers of a tertiary care hospital in capital city of India. The population under study included doctors, staff nurses, lab technicians, general duty assistants (GDAs) and house-keepers working in the various departments of a tertiary care hospital in capital city of India. Permission for carrying out the study was taken in advance. The study population consisted of 529 HCWs of various categories of hospital, to

evaluate the prevalence, awareness, attitude and vaccination status among healthcare workers to sharp injuries in a tertiary care hospital (irrespective of whether they had any sharp injury or not). The health care workers were contacted in person and told about purpose of the study and that their responses shall be kept anonymous. Informed consent was taken from each respondent before conducting the interview. The inclusion criteria were health care workers in the hospital, both male and female and including those professionals who normally deal with needles, doctors, staff nurses, lab technicians, general duty assistants (GDAs) and house-keepers. The study was carried out with help of predesigned & pretested questionnaire by simple interview technique. Questionnaire was designed to obtain desired information regarding sharp injuries. Data thus collected were entered into a computer-based spreadsheet for analysis. The statistical tests applied included frequency, percentages, standard variables, standard deviation and mean. The association between the categorical variables has been assessed by Chi-square tests for significance of associations. Statistical analysis has been done by STATA 9.0 software. Informed consent was taken from each respondent before conducting the interview. Scientific and ethical approval was taken from the committee.

RESULTS

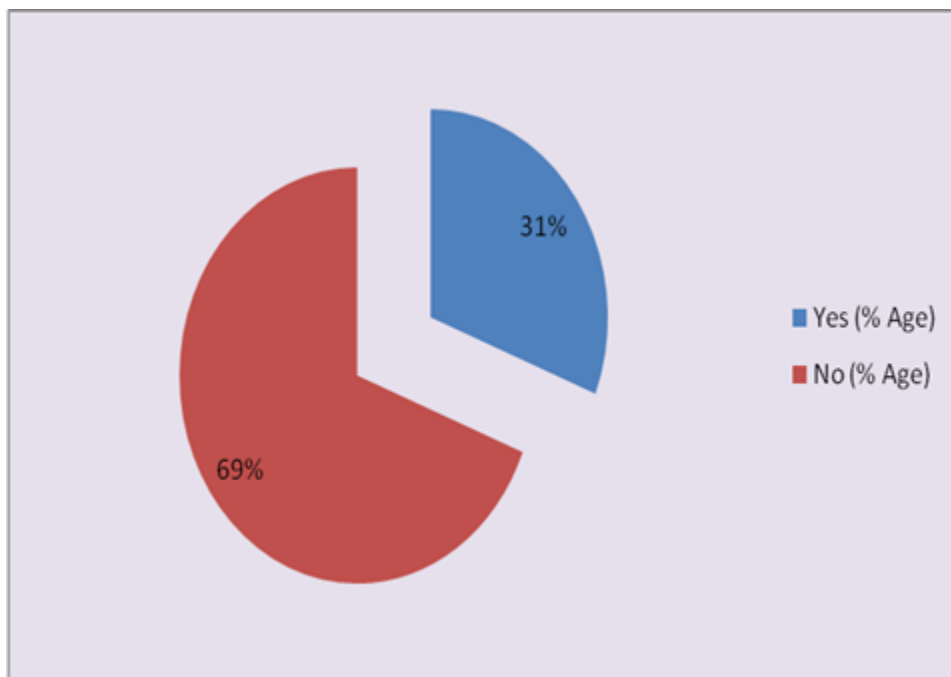
Health care workers included 529 health care workers of the hospital, consisting of 72 Doctors, 238 Staff Nurses, 39 Lab Technicians, 66 GDAs, and 114 Housekeepers (**Figure 1**).

Figure 1: Distribution of health care workers in the study



When HCWs were specifically asked about whether they ever had any Sharp injury in their life time, 31% (165 HCWs) told that they have already had NSI, while 69% (364 HCWs) told that they never had any (**Figure 2**). When evaluated category wise, it was found out that 56.9% (41 out of 72) Doctors, 34% 981 out of 238) Staff nurses, 51.3% (20 out of 39) Lab Technicians, 57.6% (38 out of 66) GDAs, 42.1% (48 out of 114) Housekeepers had NSI in their lifetime.

Figure 2: Frequency of sharp injuries among health care workers



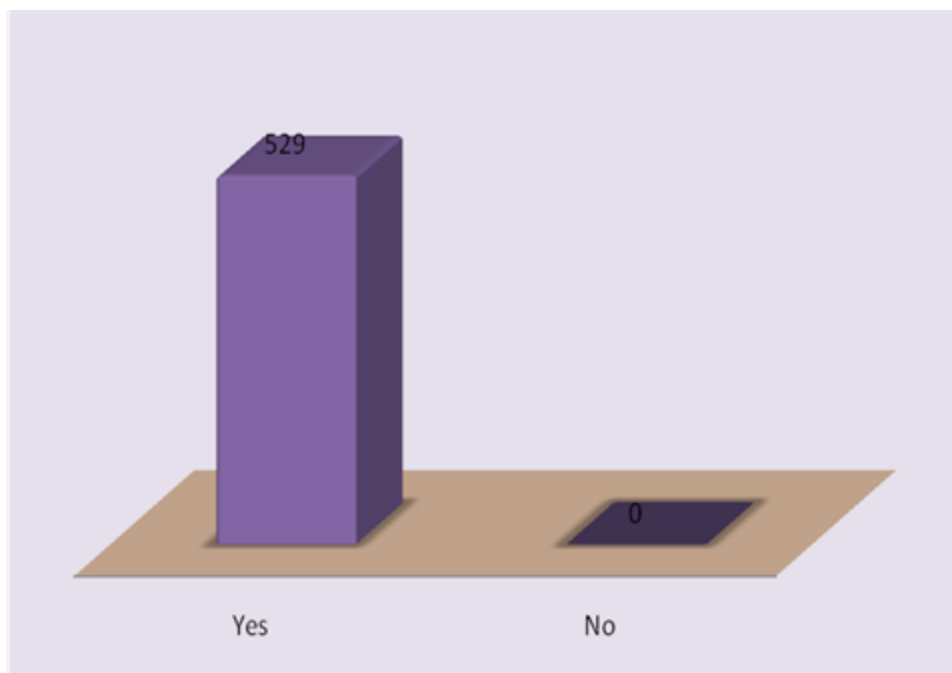
When HCWs were asked about their awareness regarding sharp injuries particularly NSI as a cause of various diseases, it was found out that 96% (509 HCWs) were aware that sharp injuries particularly can lead to some diseases, while 4% (20 HCWs) were not aware of the same . On exploring category wise Among 529 health care workers, 1.2% (3 out of 238) Staff Nurses, 7.7% (3 out of 39) Lab Technicians, 4.3% (3 out of 66) GDAs, 30.7% (35 out of 114) Housekeepers were not aware about sharp injuries particularly being a cause of certain diseases (**Table 1**).

Table 1: Distribution of awareness that sharp injuries particularly NSI can lead to various diseases in HCWs

	Doctors		Staff Nurses		Lab Technicians		GDAs		House Keepers	
	No.	%age	No.	%age	No.	%age	No.	%age	No.	%age
Yes	72	100	235	98.8	36	92.3	63	95.7	79	69.3
No	0	0	3	1.2	3	7.7	3	4.3	35	30.7
Total	72		238		39		66		114	

Among 529 health care workers, 100 % HCWs in all categories were aware that if any sharp injury happens, it should be reported to concerned department of the Hospital (**Figure 3**).

Figure 3: Distribution of reporting of sharp injuries.



On inquiring about HCWs' awareness regarding need to undergo some tests and treatment (if indicated) after sustaining NSI, 95% (503 HCWs) were aware that they may have to undergo certain blood tests and if required they should have to take treatment in form of pos exposure prophylaxis (PEP) for a certain period of time, while 5% (26 HCWs) were not aware

regarding the same. Category wise Among 529 health care workers, 0.4% (1 out of 238) Staff Nurses, 2.6% (1 out of 39) Lab Technicians and 21.1% (24 out of 114) Housekeepers were not aware that they may have to undergo certain blood tests and if required they should have to take treatment in form of PEP for a certain period of time (**Table 2**).

Table 2: Distribution of awareness regarding need for tests/ treatment in case of sharp injuries

	Doctors		Staff Nurses		Lab Technicians		GDAs		House Keepers	
	No.	/age	No.	%age	No.	%age	No.	%age	No.	%age
Yes	72	100	237	99.6	38	97.4	66	100	90	78.9
No	0	0	1	0.4	1	2.6	0	0	24	21.1
Total	72		238		39		66		114	

Among 529 health care workers, 100% HCWs admitted that they would like to follow the same if sharp injury will happen to them.

Among 529 health care workers, 71% (376 HCWs) had full Hepatitis B vaccination, while 29% (153 HCWs) did not have the same. When evaluated category wise, it was found out that among 529 health care workers,

1.4% (1 out of 72) Doctors, 24% (57 out of 238) Staff Nurses, 7.7% (3 out of 39) Lab Technicians, 50% (33 out of 66) GDAs, 51.7% (59 out of 114) Housekeepers were not vaccinated at the time they had sharp injury. (Table 3)

Table 3: Hepatitis-B Vaccination status

	Doctors		Staff Nurses		Lab Technicians		GDAs		House Keepers	
	No.	%age	No.	%age	No.	%age	No.	%age	No.	%age
Yes	71	98.6	181	76	36	92.3	33	50	55	48.3
No	1	1.4	57	24	3	7.7	33	50	59	51.7
Total	72		238		39		66		114	

DISCUSSION

On interviewing 529 randomly selected HCWs, we tried to find out certain aspects of awareness, attitude and vaccination status in case of sharp injuries particularly needle stick injuries. In our study only 31% HCWs told that they had sharp injuries in their lifetime, while majority (69%) denied for the same. But in contrast to other studies (5) episodes of sharp injuries were significantly lower ($P<0.0005$) in staff nurses as compared to other category of HCWs. Although several other studies found that a high proportions of HCWs received needle stick injuries both in India as well as internationally. (6-11) 79.5% of HCWs reported in a study from a metro city of India (12) and 73% in a study from rural north India. (13) This may be attributed to different patient overload and different work environment and work culture in the Indian scenario.

Increasing staff awareness and educating them on sharp injuries particularly needle stick injuries is a felt need particularly in this COVID 19 pandemic era. The effect of sharp injuries on work efficiency revealed that most of the HCWs (96%) were aware about sharp injuries leading to diseases although the awareness in two categories (GDAs and Housekeepers) was significantly lower as compared to other category of HCWs statistically ($P<0.001$).

All (100 %) HCWs in all categories were aware regarding need to report any sharp injury incident. All (100 % HCWs) stated that they would like to

follow the standard NSI protocol, in case sharp injury happen to them.

Majority (95%) of HCWs were aware regarding blood tests and if required, treatment in form of PEP and this was significant statistically in all categories ($P<0.001$).

Our study showed that majority (71%) already had Hepatitis B vaccination and category wise doctors and lab technicians had statistically significant higher rate of vaccination while GDAs and house keepers were the groups with lower percentages of rate of vaccination.

CONCLUSION

Sharp injuries particularly needle stick injuries represent an omnipresent hazard that people working in a hospital face daily and in this COVID 19 pandemic era the risk has increased. Prevention of sharp injuries is the best way to prevent several diseases in health care workers. Issues requiring attention include proper disposal of sharp waste, establishing an individual sharp injuries' protocol, making positive working ambience and supportive attitude towards HCWs who get sharp injuries. The education and training programs regarding dealing with needles and sharps includes precautions during use as well as disposal of the needle and it should be emphasized that there is need to maintain utmost care before, during and after use as well. Training should be a periodically regular activity as Specific training and prevention are more important than mere

guidelines and protocols in preventing sharp injuries. It is recommended that every hospital should develop its own strategy to deal with NSIs and reporting of NSIs should be made mandatory. Hospitals should have a written sharp injuries' protocol and an infection control team who should be responsible to register sharp injuries incidences as well as follow ups as per the protocol and maintaining records. There should be a surveillance team in every hospital which can audit regularly and can give recommendations on felt needs.

REFERENCES

1. CDC. Updated US Public Health Service guidelines for the management of occupational exposures to HBV, HCV, and HIV and recommendations for postexposure prophylaxis. MMWR Recomm Rep. 2001 Jun 29;50(RR-11):1–42.R
2. Wilburn SQ. Needle sticks and sharps injury prevention. Online J Issues Nursing 2004; 9: Manuscript 4.
3. NIOSH. How to prevent needlestick and sharp injuries. DHHS (NIOSH) Publication Number 2012-123
4. WHO. AIDE-MEMOIRE for a strategy to protect health workers from infection with blood borne viruses. Available from: http://www.who.int/injection_safety/toolbox/en/AM_HCW_Safety_EN.pdf
5. EPInet. Official Summary Report for Needlestick & Sharp Object Injuries, 2006. Available from: <http://www.healthsystem.virginia.edu/pub/epinet/2006-epinet-needle-stick-data.pdf>
6. Askarian M, Malekmakan L. The prevalence of needle stick injuries in medical, dental, nursing and midwifery students at the University teaching hospitals of Shiraz, Iran. Indian J Med Sci. 2006;60:227–32.
7. Whitby RM, McLaws ML. Hollow-bore needlestick injuries in a tertiary teaching hospital: Epidemiology, education and engineering. Med J Aust. 2002;177:418–22.
8. Ebrahimi H, Khosravi A. Needlestick injuries among nurses. J Res Health Sc. 2007;7:56–62.
9. Makary MA, Al-Attar A, Holzmüller CG, Sexton JB, Syin D, Gilson MM, et al. Needlestick injuries among surgeons in training. N Engl J Med. 2007;356:2693–9.
10. Singru SA, Banerjee A. Occupational exposure to blood and body fluids among health care workers in a teaching hospital in Mumbai, India. Ind J Comm Med. 2008;33:26–30.
11. Pournaras S, Tsakris A, Mandraveli K, Faitatzidou A, Douboyas J, Tourkantonis A. Reported needlestick and sharp injuries among health care workers in a Greek general hospital. Occup Med (Lond) 1999;49:423–6.
12. Rahul Sharma, SK Rasanias, Anita Verma, and Saudan Singh. Study of Prevalence and Response to Needle Stick Injuries among Health Care Workers in a Tertiary Care Hospital in Delhi, India. Indian J Community Med. 2010 January; 35(1): 74–77.
13. Kermode M, Jolley D, Langkham B, Thomas MS, Crofts N. Occupational exposure to blood and risk of bloodborne virus infection among health care workers in rural north Indian health care settings. Am J Infect Control. 2005;33:34–41.
14. Sumathi Muralidhar, Prashant Kumar Singh, R.K. Jain, Meenakshi Malhotra & Manju Bala. Needle stick injuries among health care workers in a tertiary care hospital of India. Indian J Med Res 131, March 2010, pp 405–410
15. Chacko J, Isaac R. Percutaneous injuries among medical interns and their knowledge and practice of post-exposure prophylaxis for HIV. Indian J Public Health 2007; 51 : 127-9.