

Needle stick injury and health care workers: Scenario at GMC Akola, Maharashtra

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Abstract

Introduction: Needle stick injuries are the most common occupational hazard for health care workers as well as they carry the highest risk of transmission of various blood borne infections. The greatest menace are hepatitis B and hepatitis C followed by HIV. The present study was carried out to determine the incidence of needle stick injury (NSI) among the health care workers (HCWs) and also the efficacy of preventive strategy.

Materials and Methods: This study was conducted at ICTC-1 (Voluntary counselling and testing centre), Department of Microbiology, GMC Akola which is a 600 bedded, tertiary care hospital in Maharashtra, India. The study was carried out over two and half years from April 2015 to October 2017 on various HCWs. Data was collected from ICTC-1 and follow up of patient was done up to 6 months. Biomedical waste (BMW) management workshops and training were also conducted every 6 months.

Results: A total of 318 HCWs who were exposed to NSI visited ICTC-1. The highest rate was found among intern doctors (31.44%) and waste handlers (29.87%) followed by student nurses (20.44%), staff sister/brother (11.32%), laboratory technician (5%) and senior doctors (1.88%). There has been increased reporting and awareness among the HCWs due to the regular workshops and training programmes for BMW management.

Conclusion: A lot needs to be done to reduce the burden of NSI. Substitution of needles with safe, newer devices, adequate training of health care workers regarding safe use and disposal of needles, post exposure prophylaxis, vaccination (Hepatitis B) might change the scenario.

Keywords: Needle stick injury, Waste disposal, Biomedical waste management, Occupational health hazards.

Introduction

Needle stick injuries (NSI) are wounds caused by sharps such as hypodermic needles, blood collection needles, IV cannulas, suture needles, winged needles.¹ NSI comprises one of the most common health care associated infections among health care personnel which include doctors, nurses, laboratory technicians, waste handlers. The causes include various factors like type and design of the needle, recapping activity, handling or transferring specimens, careless disposal in garbage bags due to inadequate segregation at source. Factors that further increase the risk are exposure to the following: device contaminated with patient's blood, a deep puncture, a hollow bore needle, high viral load titres of source patient.² HIV, Hepatitis B, Hepatitis C are the most common and life-threatening blood borne infections that are transmitted by NSI.³

WHO reports that, out of 35 million health care workers, 2 million experience percutaneous exposure to infectious diseases each year. It further notes that 37.6% of Hepatitis B, 39% of Hepatitis C and 4.4% of HIV/AIDS in Health Care Workers worldwide are due to NSI.⁴ Studies from India have reported high rate of NSI amongst resident doctors and nurses.⁵

Considering these factors, the present study focuses on the prevalence of NSI among HCWs belonging to different job categories as well as the efficacy of preventive strategies to reduce NSI among HCWs.

Materials and Methods

Study Design and Subject: This prospective study was conducted at ICTC-1 centre (Voluntary counselling and testing centre), Department of Microbiology, GMC Akola which is a 600 bedded, tertiary care hospital in Maharashtra, India. The study group consisted of various HCWs including intern doctors, staff and student nurses, laboratory technicians and waste handlers. The study was carried out over two and half year from April 2015 to October 2017.

Data Collection: Data was collected from ICTC-1 where pre-test counselling was done for those who were exposed to NSI.

Follow up of Patient: Seronegative patients were again called by ICTC counsellor by 12 weeks and follow up was done up to 6 months.

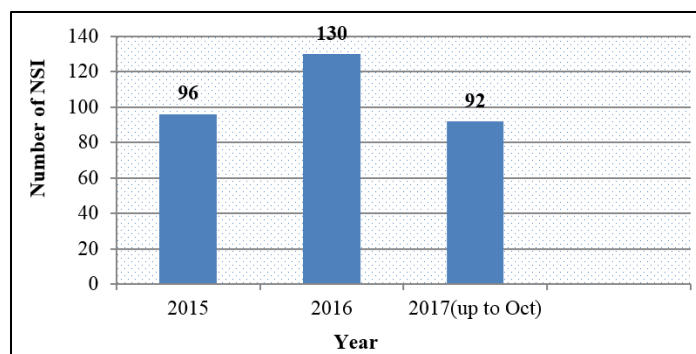
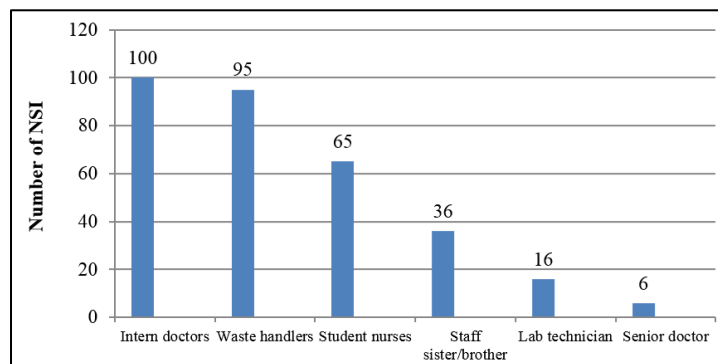
Preventive Strategy: Biomedical waste (BMW) management workshops and training were conducted every 6 months since January 2016 to increase the awareness levels among various HCWs. Workshop was also conducted according to latest BMW guidelines of 2016.

Results and Discussion

A total of 318 HCWs who were exposed to NSI visited ICTC-1. After counselling HCWs were started on Anti-retroviral therapy (ART) for a month.

Table 1: Year wise distribution of NSI among HCWs

HCWs	2015	2016	2017 (upto Oct)	Total
Intern doctors/Residents	30	45	25	100
Waste handlers	28	33	34	95
Student nurses	22	25	18	65
Staff sister / brother	10	18	8	36
Laboratory technicians	4	7	5	16
Senior doctors	2	2	2	6
			Total	318

**Fig 1: Number of NSI reported over two and half year period at a tertiary care hospital****Fig 2: Number of NSI reported over two and half year period by different categories of staff**

EPI-net data (Exposure Prevention Information Network which provides standardized methods for recording and tracking percutaneous injuries and blood and body fluid contacts) for 2011 reports a rate of approximately 19.46 NSI per 100 beds per annum in teaching hospitals.⁶ According to EPI-net data,⁶ an equivalent number of injuries for a 600 bedded teaching hospital such as Akola GMC would be 116. The rate of NSI at Akola GMC in the year 2015, 2016 and 2017 (up to Oct) is 16/100 bed, 21/100 bed and 15/100 bed respectively. The number reported in 2016 and 2017 represents an increase compared to the previous year. This may be attributed to increased reporting and awareness among the HCWs which is again accomplished by regular workshops and training programmes for BMW management.

In our study, the average incidence of NSI is found to be 17%. Whereas, study by Bhardwaj A et al⁷ reported the prevalence to be 20.9%. Among all the HCWs, intern doctors (31.44%) got more number of

NSI followed by waste handlers (29.87%), student nurses (20.44%), sister/brother (11.32%), laboratory technician (5%) and senior doctors (1.88%). These data correspond with several reports from India.^{8,9} Study like Debbarma et al¹⁰ (Delhi, 2016) reported the incidence of NSI among doctors, nurses and technicians to be 38%, 51% and 40% respectively which is different from our study. Few studies from India,^{10,11} Saudi Arabia,¹² USA¹³ reported NSI being less common among doctors than nurses. This difference may probably due to more involvement of the doctors with clinical procedures in teaching hospitals. Resident doctors were not included in the study due to unavailability of post graduate residents at the hospital.

The probability of having NSI is inversely related to years of experience.¹⁴ This fact was highlighted in the present study also. Most of the injuries were found among the newly joined intern doctors. Lack of experience, lack of knowledge regarding injection

safety guidelines may be the contributing factor in this.¹⁵

During the follow up period, none of the HCW showed seroconversion which is correlating with the study of Muralidhar et al (Delhi, 2010).¹⁶

Of the blood borne diseases, hepatitis B is the only one that is preventable by vaccination.¹⁷ After our study, we recommended to GMC Akola administration to make HBV vaccine available for the waste handlers.

Conclusion

NSI remains a major health hazard among the HCWs. There is much room of improvement in the working conditions and safety protocols for HCWs to reduce the burden of NSI. Substitution of needles with safe, newer devices, adequate training of HCWs regarding safe use and disposal of needles, post exposure prophylaxis, vaccination (Hepatitis B) might change the scenario.

References

1. Radha R, Khan A. Epidemiology of Needle Sticks Injuries Among The Health Care Workers of A Rural Tertiary Care Hospital-A Cross-Sectional Study. *Natl J Community Med.* 2012; 3(4):589-94.
2. Verma y, Bandlish D, kumar b. The prevalence of needle stick injury among healthcare personnel in a tertiary care hospital in Kolkata. *Webmed Central Clinical Microbiology.* 2015;6(9):WMC004983.
3. Yang YH, Liou SH, Chen CJ, Yang CY, Wang CL, Chen CY, et al. The effectiveness of a training program on reducing needle stick injuries/sharp object injuries among soon graduate vocational nursing school students in southern Taiwan. *J Occup Health.* 2007;49(5):424-9.
4. Protecting health care workers preventing needle stick injuries [online]. 2016 [July 28]; WHO. Available from: http://www.who.int/occupational_health/topics/needinjuries/en/. Accessed on 29/10/17.
5. Rele M, Mathur M, Turbadkar D. Risk of needle stick injuries in health care workers-A report. *Indian J Med Microbiol.* 2002;20:206-7.
6. International Healthcare Worker Safety Center, University of Virginia. U.S. EPINet Sharps Injury and Blood and Body Fluid Exposure Surveillance Research Group. Sharps Injury Data Report;2011. Available from: <http://www.healthsystem.virginia.edu/pub/epinet/epinetdatareports.html#CitingEPINet>. [Last accessed on 2017 Jun 11].
7. Sharp safety for healthcare setting. CDC.[online]. 2015 [February 11]. Available from: <https://www.cdc.gov/sharpsafety/>. Accessed on 29/10/17.
8. Sharma A, Gur R, Bhalla P. Study on prevalence of needle stick injury among health care workers in a tertiary care hospital in New Delhi: A two-year review. *Indian J Public Health.* 2012;56:101-3.
9. Salelkar S, Motghare DD, Kulkarni MS, Vaz FS. Study of needle stick injuries among health care workers at a tertiary care hospital. *Indian J Public Health.* 2010;54:18-20.
10. Ashat M, Bhatia V, Puri S, Thakare M, Koushal V. Needle stick injury and HIV risk among health care workers in North India. *Indian J Med Sci.* 2011;65:371-8.
11. Sharma S, Gupta A, Arora A. Knowledge, attitude and practices on needle-stick and sharps injuries in tertiary care cardiac hospital: A survey. *Indian J Med Sci.* 2010;64:396-401.
12. Jahan S. Epidemiology of needlestick injuries among health care workers in a secondary care hospital in Saudi Arabia. *Ann Saudi Med.* 2005;25:233-8.
13. Clarke SP, Sloane DM, Aiken LH. Effects of hospital staffing and organizational climate on needlestick injuries to nurses. *Am J Public Health.* 2002;92:1115-9.
14. Mbaisi EM, Ng'ang'a Z, Wanzala P, Omolo J. Prevalence and factors associated with percutaneous injuries and splash exposures among health-care workers in a provincial hospital, Kenya, 2010. *Pan Afr Med J.* 2013;14:10.
15. Goel V, Kumar D, Lingaiah R, Singh S. Occurrence of needlestick and injuries among health-care workers of a tertiary care teaching hospital in North India. *J Lab Physicians.* 2017;9:20-5.
16. Singhal V, Bora D, Singh S. Hepatitis B in health care workers: Indian scenario. *J Lab Physicians.* 2009;1:41-8.
17. Muralidhar S, Singh P, Jain RK, Bala M. Needle stick injuries among health care workers in a tertiary care hospital of India. *Indian J Med Res.* 131, March 2010, pp 405-10.

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