

ORIGINAL ARTICLE

Needlestick Injuries among Laboratory Technicians in Diagnostic Laboratories of Kanyakumari District, India

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Abstract: *Background:* Healthcare workers (HCW) are very prone for accidental Needlestick Injuries. In spite of health education and interventions for prevention, needlestick injuries are still common. A production survey was performed to estimate the magnitude of needlestick injuries (NSI) among laboratory technicians of Kanyakumari district in southern Tamil Nadu, India. *Methods:* We reviewed the surveillance data of NSI over a period of one year (December 2008–November 2009). Questionnaire were distributed to a stratified random sample of 1096 Laboratory Technicians in Diagnostic laboratories of Kanyakumari district to collect self reported NSIs. *Results:* Of the 986 Laboratory Technicians who returned a complete questionnaire, 212 (21.5%) sustained one NSI and 76 (7.7%) had sustained between one to four injuries in the past 12 months. The devices mainly responsible for NSI's were hollow bore needles (n=220, 79%) solid (18%) and others (3%). Almost all injuries were caused during Blood collection procedure and Decapping or recapping of the needles and 96.4% of injuries involved fingers. Of the 288 (29.2%) laboratory technicians who sustained NSI's, 204 (70.8%) took post exposure prophylaxis and subsequently followed up for Human Immunodeficiency Virus (HIV), Hepatitis B virus (HBV) and Hepatitis C virus (HCV). Three technicians turned up positive, two for Hepatitis B virus and one for HIV. *Conclusion:* Proper education and adopting universal precautions are necessary to prevent NSI among laboratory technicians.

Keywords: Universal precautions, Needlestick injuries, Laboratory technicians.

Introduction

Lab. Technician who use and are exposed to needles are at an increased risk of needlestick injuries. More than 20 diseases have been perceived to be transmitted by NSI [1], resulting in the increased risk of having blood-borne infections such as Human Immunodeficiency Virus, Hepatitis B Virus & Hepatitis C Virus, with HBV being the most common blood-borne pathogen that poses as an occupational risk to laboratory Technicians [2-3]. The US Centers for Disease Control and Prevention estimates that 800,000 exposure incidents occur annually [4]. Though there are few reports available from various hospitals from North India [5-8], the data from various centers of south is sparse [9-10].

Objectives:

1. The study was undertaken to know the epidemiology of NSI's among laboratory technicians in the diagnostic laboratories of a district in south Tamil Nadu, India
2. To determine the risks & educate the laboratory technicians regarding NSI's.

Material and Methods

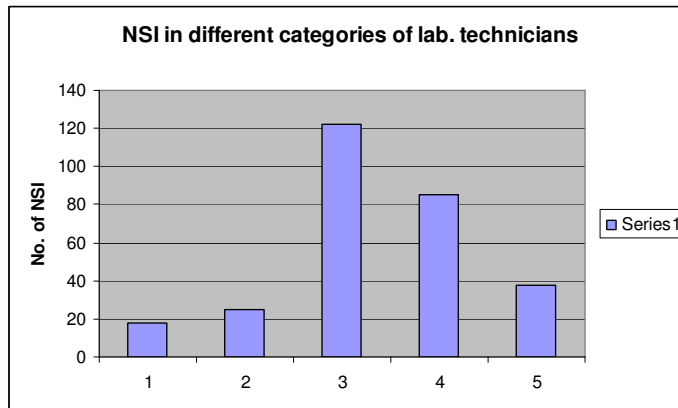
All the laboratory technicians of diagnostic laboratories in Kanyakumari district of South Tamil Nadu, including Diagnostic Laboratories of two Medical colleges, Four super speciality hospitals, 86 multispeciality hospitals and 46 Big & 152 small diagnostic laboratories were the study subjects. Data collection was done by a retrospective review of NSI's that occurred in the diagnostic laboratories of KanyaKumari district between December 2008 and November 2009.

Details like time of incident, place, description, type of first aid taken and whether universal precautions were followed by the laboratory technicians were noted.

Results

During the study period from December 2008 to November 2009, 288 (29.2%) laboratory technicians sustained NSI's of which 212 Sustained one NSI and 76 recalled having sustained between one and four injuries. Among the 288 Laboratory Technicians who sustained NSI's, 206 (71.5%) were those who had less than one year work experience. The majority of the devices responsible for NSI's were hollow bore needles in 180 cases, (n=220, 78%) with solid needles in 32 (17%) and others 8 (5%) for the remainder. The activities accounting for NSI were mostly during procedures. (n=180, 89%). The most common procedures responsible were blood collection procedures, followed by checking blood sugar levels and others.

A large proportion of NSI occurred because of incorrect handling of equipments such as recapping, improper disposal of the sharp instruments and overflowing containers. An other important association that was noted between incidence of NSI's and shift/ time of work, 26% of NSI's occurred during late nights or Early morning hours especially in hospitals. Of the 288 technicians who sustained NSI's, 18 (6.25%) were from two Medical colleges, 25 (8.6%) from four superspecialty hospitals, 122 (42.3%) from multispecialty hospitals, 85 (29.5%) from big laboratories and 38 (13.1%) from small laboratories. Of the Laboratory Technicians who sustained NSI's only 64 (22.2%) were adequately immunized for Hepatitis B.



- 1. Lab. Technicians from two Medical Colleges
- 2. Lab. Technicians of Superspeciality Hospitals
- 3. Lab. Technicians of Multispeciality Hospitals
- 4. Lab. Technicians of Big Laboratories
- 5. Lab. Technicians of Small Laboratories

Known sources accounted for 276 (96%) & unknown sources 12 (4%) of the injuries. Of the 288 (29.2%) laboratory technicians who sustained NSI's, three technicians turned up positive, two for Hepatitis B virus and one for HIV.

Discussion

In our study, 288 (29.2%) laboratory technicians sustained NSI's. A study by Fisman et.al [11] shows that laboratory technicians are the next common group after nurses among Healthcare workers to sustain NSIs. Laboratory technicians with less than one year of experience (Junior laboratory technicians) sustained more injuries and this can be a reflection of their inexperience. Ever year approximately 3 million HCW's experience percutaneous exposure to bloodborne viruses (BBV's) that results in as estimated 66,000 Hepatitis B, 16000 Hepatitis C & 200-5000 HIV infections annually [12]. Our study showed 78% of NSIs to be associated with hollow bore needles which is almost the same as shown by Askarian et al (72.2%,) [13] and Nee et a [14] (62.2%). Our Study indicates that junior Laboratory Technicians were more likely to sustain NSI's. Working mixed shifts (rotating day and night) was also associated with increased risk of sustaining NSI's. Laboratory Technicians who reported significant fatigue after work were more likely to sustains NSI's.

The NSIs that occurred while blood sugar monitoring can be prevented using safety devices such as lancet pens for sugar estimation. Among the Laboratory technicians who sustained NSI, two were positive for Hepatitis B virus and one for HIV. The low prevalence of Hepatitis in this geographical area may be the reason low risk of NSI related hepatitis.

Needlestick injuries from various Hospitals in India [5-8]		
Hospital	Period	NSI's
Hinduja Hospital	1998-2003	380
CMC, Vellore	1993-1999	347
LTM Hospital, Mumbai	2000-2001	34
CMC, Vellore	2006-2007	296

Because of the unavailability of clear data on NSI's among laboratory technicians in India, which may be due to underreporting, it is not possible to estimate an annual incidence.

Conclusion

Laboratory technicians are very much prone for NSI because of occupational exposure to blood/body fluids. Various methods to reduce the NSI among laboratory technicians include using safety devices such as special cannulae & lancet pens for sugar estimation. The activities accounting for NSI's were mostly during procedures like blood collection, and hence the laboratory technicians has to be careful while performing these procedures. Our findings point to the need for greater & continuing education in the use of universal precautions or standard procedures in all the categories of laboratory technicians. Improved education, prevention and reporting strategies, emphasis on appropriate disposal are other strategies needed to increase occupational safety for laboratory technicians.

References

1. Jagger J, Hunt EH, Brand- Elnaggar J, P J, Pearson RD. Rates of needle-stick injury caused by various devices in a university hospital. *N Engl J Med* 1988; 319:284.
2. Riddell LA, Sherrard J. Blood-borne virus infection: The occupational risks. *Int J STD AIDS* 2000; 11:632-9.
3. Gerberding JL. The infected healthcare provider. *N Engl J Med* 1996; 334:594.
4. Porta C, Handleman E, McGoren P. Needle stick injuries among health care workers: A literature review *American association of occupational health nurses* 1999; 47(6):237-243
5. Kernode M, Jolley D, Langkam B, Thomas MS, Crofts N. Occupational exposure to Blood & Risk of Bloodborne Virus Inf. Among Health care workers in Rural North Indian Health Care Settings. *Am. J. Infect. Control* 2005; 33: 34-41
6. Rele M, Mathur M, Turbadkar D. Risk of Needlestick injuries in Health care Workers: A Report. *Ind. J. Med. Micro.* 2002; 20; 206-7
7. Mehta A, Rodrigues C, Ghag s,Bavi P, Shenai S, Dastur F. Needlestick injuries in a Tertiary Care Centre in Mumbai, India. *J. Hosp. Infect.* 2005; 60: 368-373
8. Richard VS, Kenneth J, Ramaprabha P, Kirupakaran H, Chandy GM. Impact of introduction of sharp containers and of education programmes in the pattern of needle stick injuries in a tertiary care centre in India. *J. Hospital infection* 2001; 47: 163-5.
9. Bairy I, Rao SP, Dey A. Exposure to blood-borne viruses among healthcare workers in a tertiary care hospital in south India. *J Postgrad Med.* 2007; 53(4): 275-6.
10. Jayanth ST, Kirupakaran H, Brahmadathan KN, Gnanaraj L, Kang G. Needle stick injuries in a tertiary care hospital. *Indian J Med Microbiol.* 2009; 27(1):44-7.
11. Fisman DN, Harris AD, Rubin M, Sorock GS, Mittleman MA. Fatigue increases the risk of injury from sharp devices in medical trainees: Results from a case-crossover study. *Infect Control Hosp Epidemiol* 2007; 28:10
12. Haidivas DJ, Domaid TM, Stevans DA, Five year study of needle stick injuries. Significant reduction associates with communication, education and convenient placement of sharp containers, *Infect control hospital epidemio* 1992; 13: 265-7
13. Askarian M, Shaghaghian S, McLaws ML. Needlestick injuries among nurses of Fars Province, Iran. *Ann Epidemiol* 2007; 17: 988-92.
14. Nee L, Lim HL, Chan YH, Bachok DB. Analysis of sharps injury occurrences at a hospital in Singapore. *Int J Nurs Prac* 2002; 8: 274-281

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