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Original Research Article

A cross sectional study on needle stick and sharp injuries among health care providers in tertiary centers, Tamil Nadu

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ABSTRACT

Background: Health care workers are at risk of acquiring life threatening blood borne infections through needle stick and sharp injuries (NSSI) in their work place. This study was planned to highlight some important factors responsible for NSSI and possible measures to reduce it. The objective of the study was to assess the factors associated with NSSI and reasons for under-reporting.
Methods: A cross sectional study was done during November 2014 to April 2015 in two tertiary health care institutions. All health care providers (Doctors, nurses and lab technicians) who had more than one year experience and gave informed consent were included. Data collected by pretested structured questionnaire. Data analysis was done using SPSS 20v and summarized by descriptive statistics. Proportion and Chi-square was calculated at 5% α.
Results: Among 950 health care providers (HCPS), 649 (68.3%) had NSSI during their carrier, 335 (35.3%) in last one year. Females 225 (67.2%) experienced more NSSI. This study shows that, 98 (29.3%) HCPs had sustained injury once. Among the doctors, 51.4% Anaesthetist (p=0.001) and its more among the nurses (38.4%) followed by doctors (36.6%) (p=0.002). NSSI was more common among HCP who work between 30-40 hrs (p=0.00001). Majority of them sustained injury while performing the procedure 134 (40%), commonest place of injury was OT 149 (44.5%) and commonest item responsible was hypodermic needle 141 (42.1%). Only 50 (14.9%) reported to the concerned authority and follow up action was taken.
Conclusions: The study shows high prevalence of NSSI, emphasizing the need for safe measures for handling sharps to prevent transmission of infection.

Keywords: Needles stick injury, Sharp injury, Health care providers

INTRODUCTION

Needle stick injuries are neglected by many health care providers and it is the major route of transmission of serious blood borne diseases.

According to World Health Organization, 35.7 million health care workers in the world are exposed to the risk of Needle stick injuries, 2 million experience percutaneous exposures to infectious diseases each year and 4 needle stick injuries per worker within year in African, Mediterranean and Asian populations.[1,2]

It further notes that 37.6% of hepatitis B, 39% hepatitis C and 4.4% HIV/AIDS in health-care workers around the world were due to needle stick injuries.[3] Other infections transmitted through needle sticks include syphilis, malaria, herpes etc.while 90% of the occupational exposures occur in developing countries and 40-75%goes underreported.[4,5]

The Health Protection Agency report (2012) on health care workers stated that injuries during occupational exposure among the medical and dental professions increased by 131% (100-231) from 2002 to 2011.[6]

Infections from each of these pathogens were potentially life threatening and preventable. The emotional impact of needle stick injury could be severe and long lasting, even when a serious infection was not transmitted. Not knowing infection status of patient among those injured can accentuate the stress. More than 80% of needle stick injuries can be prevented through the use of safer devices and effective safety programs.[7] There not much of studies in south India, hence this study attempted.

The primary objective of the study was to assess the factors associated with NSSI. Secondary objective was reasons for under-reporting.

METHODS

A cross sectional study was done during November 2014 to April 2015 in two tertiary health care institutions in Chennai and Madurai, Tamil Nadu. Institutional Ethics committee approval was obtained. All the health care providers (Doctors, nurses and lab technicians) who had more than one year experience and gave informed consent were included in this study. Data were collected by pre tested structured questionnaire consisting of demographic details, years of experience, hours of work per day and time, place and item caused injuries.

Statistical analysis

Data was recorded in MS Excel sheet, analyzed using statistical software SPSS version 20. Mean, Standard Deviation, Frequency and Percentages were calculated. Chi square test calculated to find the difference between the variables at 5% level of significance.

RESULTS

The total number of study participants was 950. Their age ranged from 21 to 70 years. Majority of them were females 642 (67.6%). There were 380 (40%) doctors, 489 (51.5%) nurses and 81 (8.5%) lab technicians. Majority of them have work experience between 1-10 years 498 (52.4%). Most of them 503 (52.9%) work for 30-40 hours per week (Table 1).

Among the 950 health care providers, 649 (68.3%) had NSSI during their carrier, 335 (35.3%) in last one year. It also reveals that females 225 (67.2%) had experienced more than males 110 (32.8%) which not statistically significant (p=0.8). This study also shows that, 98 (29.3%) HCPs had sustained injury once, 173 (51.6%) had injury 2-5 times, 50 (14.9%) had injury 6-10 times, 9 (2.7%) had injury 11-15 times and 5 (1.5%) had injury >15 times in last one year. The number of pricks among HCPs range between 1–30 times.

Table 1: Demographic profile of the study participants

Variables	Frequency (%)
Age	
21-30	323 (34.0)
31-40	398 (41.9)
41-50	145 (15.3)
51-60	81 (8.5)
61-70	3 (0.3)
Sex	
Male	308 (32.4)
Female	642 (67.6)
Class	
Doctors	380 (40.0)
Nurses	489 (51.5)
Lab technicians	81 (8.5)
Experience (in years)	
1-10	498 (52.4)
11-20	308 (32.4)
21-30	118 (12.5)
31-40	24 (2.5)
>40	2 (0.2)
Hours of work/week	
30-40	503 (52.9)
41-50	347 (36.5)
51-60	100 (10.5)

Table 2: Distribution of needle stick and sharp injuries among health care providers.

Health care providers	Frequency (%)
Doctors*	139 (36.6)
Physician (n=146)	32 (21.9)
Surgeon (n=150)	69 (46.0)
Anaesthetist (n=37)	19 (51.4)
OG (n=47)	19 (40.4)
Nurses	188 (38.4)
Lab technicians	8 (9.9)

Table 2 describes that, Among the doctors, 51.4% anaesthetist had NSSI followed by surgeons 46% and OG 40.4% which was statistically significant (p=0.001). Similarly, NSSI was more among the nurses (38.4%) followed by doctors (36.6%), which was also statistically significant (p=0.002).

NSSI was more common among people who had experience between 1-10 years 173 (49.4%) followed

HCPs working between 11-20 years 122 (36.4%) which was not significant (p=0.3). It provides evidence that there was decreased trend as age advances (Figure 1).

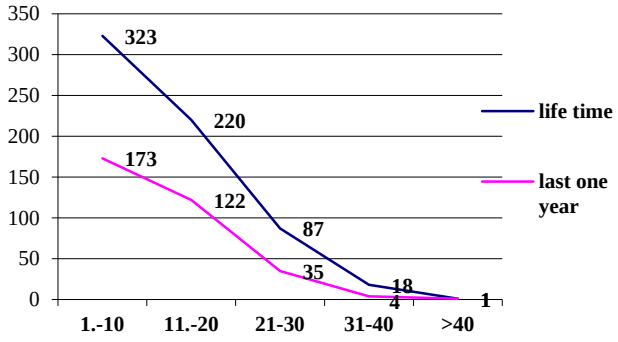

Figure 1: Trend of years of experience and NSSI among study participants.

Table 3: Distribution of hours of work and NSSI.

Hours of work	NSSI		Significance
	Yes (%)	No (%)	
30-40	215 (64.2)	288 (46.8)	
41-50	91 (27.2)	256 (41.6)	Chi sq=19.51
51-60	29 (8.6)	71 (11.6)	P=0.00001
Total	335 (35.3)	615 (64.7)	

Table 3 explains that NSSI was more common among HCP who work between 30-40 hours and their differences was found significant (p=0.00001).

Table 4 describes that, Majority of them sustained injury while performing procedures 134 (40%), commonest place of injury was operation theaters 149 (44.5%) and commonest item responsible for the injury was hypodermic needle 141 (42.1%). Fingers were most commonly affected 332 (99.1%), followed by hand 3 (0.9%).

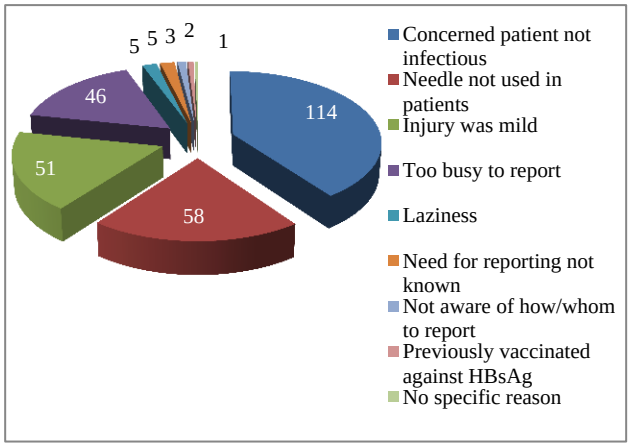

Figure 2: Reasons for not reporting about.

Figure 2 shows that, among 335 HCPs who had injury, only 50 (14.9%) reported to the concerned authority and follow up action was taken. The reason most of them reported was concerned patients not infectious (40%).

Table 4: Distribution of items, circumstances and place of injury.

Injury	Frequency (%)
Items caused the injury	
Hypodermic needle	141 (42.1)
Suture needle	107 (31.9)
Glass items	53 (15.8)
Venflon	12 (3.6)
Scalpel blade	12 (3.6)
Guide wire	3 (0.9)
Diathermy knife	2 (0.6)
Aluminium foil over the vial	2 (0.6)
Driller	1 (0.3)
Micro ear instrument	1 (0.3)
Bone	1 (0.3)
Circumstances leading to injury	
While performing procedure	134 (40.0)
Opening unused syringe	68 (20.3)
While opening ampoule/vial	44 (13.1)
Recapping used syringe	63 (18.8)
Broken ampoule/vial	10 (3.0)
Struck accidentally by colleagues	8 (2.4)
Assembling/disassembling device	7 (2.1)
During sharps disposal	1 (0.3)
Place of injury	
Operation theater	149 (44.5)
wards	127 (37.9)
ICU	28 (8.3)
Out-patient department	22 (6.6)
Lab	6 (1.8)
Labour room	2 (0.6)
Emergency department	1 (0.3)

DISCUSSION

In the present study, 68.3% had NSSI during their carrier which was comparable with the study done by Afridi et al (64%).[8] The proportion of NSSI in this study was 35.3% during last one year and females (67.2%) had experienced more NSSI which was comparable with the study done by Kebede et al showed prevalence of 30.8% and NSSI was reported more among females.[8,9] NSSI was more among the nurses (38.4%) which was similar to the other studies.[10-13]

In present study, 29.3% HCPs had sustained injury once, 173(51.6%) had injury 2-5times in last one year. No of pricks among HCPs range between 1-30. The results were higher than the study done by Voide et al shows 9.7% had sustained at least one NSSI during the preceding twelve months. Of these, 171 (65.8%) had sustained one NSSI, 60 (23.1%) had sustained two and 29 (11.1%) more than two. The number of NSSIs/ respondent varied from 1 to 10.[10]

Majority of them sustained injury while performing the procedure 134 (40%), commonest place of injury was operation theaters 149 (44.5%) and whereas in other studies, the most common place of occurrence of NSSIs was ward and in study done by Bhattarai et al most of injuries were (35.6%) occurred while manipulating needle into patients.[12,14,15]

Commonest item responsible for the injury was hypodermic needle 141 (42.1%) which was similar to the other studies.[8,12,13,15]

Fingers were most commonly affected 332 (99.1%), followed by hand 3 (0.9%) whereas in a study done by showed hands were the most affected body parts.[12]

Among the doctors, 51.4% anaesthetist had NSSI followed by surgeons 46% and OG 40.4% whereas study done by Sharma et al greater prevalence of needle stick injuries was observed in the medicine department as compared to the surgery department.[14]

Only 14.9% reported to the concerned authority and follow up action was taken, which was almost similar to the study done by Ziad et al and Bhattarai et al, the reporting rate was 13.84% and 11.4% respectively.[12,15] The reason for underreporting in the present study was concerned patients not infectious (40%) whereas study done by Voide et al, the principal reasons for not reporting were 1) self estimation that the NSSI was low risk with respect to blood-borne virus transmission (87.1%) and 2) perceived lack of time (34.3%).[10] The results were in favor of fact that Needle stick injuries go unreported.

Recommendations

Even though training programs had been conducted periodic reinforcement of infection control programs are needed for safety of various levels of health care providers.

CONCLUSION

The study shows high prevalence of NSSI, which is inevitable; efforts should be taken to reduce it. Though it cannot be prevented completely, HCPs should be constantly aware that it can happen at any time and extra measures should be taken to prevent it as far as possible.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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