

KNOWLEDGE, ATTITUDE AND PRACTICES OF NEEDLE-STICK INJURIES AMONG HEALTHCARE WORKERS

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ABSTRACT

BACKGROUND

Needle-stick injuries (NSI) are important occupational hazards confronting the Health care worker (HCW), with the potential of transmitting blood-borne infections.

This study aimed to investigate the occurrence and causative factors of NSI and assess the knowledge and response of subjects when these incidents occur in a health facility.

METHODS

Self-administered structured questionnaires were distributed to Doctors, Nurses and Medical Laboratory Scientists at the Niger Delta University Teaching Hospital (NDUTH), Okolobiri. The returned questionnaires were analyzed using simple frequencies and percentages.

RESULTS

There were 112 properly filled returned forms out of 150, giving a response rate of 74.66%. About 42.85% of the respondents had encountered at least one NSI in the course of their careers. Giving intravenous injections was the commonest cause of NSI, although giving intramuscular injections was the commonest among nurses. Most NSI occurred after the procedure had been completed and carelessness on the part of the HCW was responsible for majority of the NSI. Majority of the respondents (94.64%) were aware of Universal precaution guidelines and the existence of Post-Exposure prophylaxis (PEP) services at the hospital, but did not know the venue for PEP or whom to contact. None of the respondents reported any of the NSI incidents.

CONCLUSION

Needle-stick injuries are common in the NDUTH, with no reporting of the incidents. A robust PEP programme needs to be instituted together with continuous training on the handling of sharp objects.

Keywords: Needle-stick injuries, Post-Exposure prophylaxis, Healthcare worker, Universal precaution

INTRODUCTION

Needle-stick injuries (NSI) present a common occupational health risk that exposes healthcare workers to blood, with the potential of transmitting blood-borne infections. Over 20 blood-borne pathogens including Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) and the Human Immunodeficiency Virus could be potentially transmitted [1].

It is estimated that 3 million of the 35 million Health care workers (HCW) globally, receive percutaneous exposure to blood-borne pathogens yearly, with more than 90% of the incidents occurring in developing countries, leading to HCV, HBV and HIV infections [2].

Over the years, Universal precaution has been employed which include but not limited to disposal in sharps containers and avoidance/elimination of recapping of needles. This is believed to have reduced the incidence of NSI [3], but incidents still occur from overfilled sharps containers or needles protruding from these containers.

There are no available national statistics of NSI in Nigeria and that for Bayelsa State of Nigeria is not known. This study therefore aims to fill some of the gaps in knowledge concerning NSI in Bayelsa State by assessing these events among healthcare workers in a tertiary health institution. The objectives include determining the frequency of NSI, knowledge, attitude and responses when these events occur among healthcare workers who routinely use sharp objects in the course of their duties. We also sought to investigate the causes of NSI. Our results would contribute to strategies and interventions to reduce incidents from sharp objects.

METHODS

This was a cross-sectional study carried out in the first week of July 2013 (1st to 7th July 2013). The Niger Delta University Teaching Hospital, Okolobiri, Bayelsa State, Nigeria (NDUTH), is a relatively new tertiary healthcare institution. It has in its employ, health workers of various cadres and disciplines.

Anonymous self-administered structured questionnaires were distributed to all available doctors, nurses and laboratory scientists over a one-week period.

The questionnaire asked about the gender, age group, occupation, status, number of years post-qualification, length of time with the NDUTH, awareness of Universal precaution guidelines, number of NSI encountered, venue of the NSI, use of gloves, type of sharps involved, timing of the event during procedures and the type of action taken after the incident and finally, the awareness of Post-Exposure Prophylaxis (PEP) protocols or facilities at the NDUTH.

A needle-stick injury was defined as a percutaneous piercing wound caused by needles (hollow and solid), cannulae or any sharp object used in the treatment of patients.

Data extracted was entered to an Excel spreadsheet. Results were analyzed using simple frequency and percentages. Ethical approval was obtained from the Ethics Review Board of the hospital.

RESULTS

One hundred and fifty questionnaires were distributed and 112 were properly completed with appropriate responses and returned. The response rate was therefore 74.66%. Response rates among the professions were: Doctors 73.56% (64 out of 87), Nurses 73.46% (36 out of 49) and Medical laboratory Scientists 85.71% (12 out of 14).

There was very high awareness of Universal precaution guidelines as only 6 out of 112 (5.35%) respondents were not aware of these guidelines.

Forty eight Health Care Workers (HCW) out of the 112 respondents had been exposed to an NSI at least once in the course of their careers (42.85%). Seventy nine different NSI events had occurred, with 8 HCW responsible for 39 (49.36%) of these incidents (3 Consultants, 2 Registrars, 2 House Officers, 1 Senior Nursing Officer) (Table 1).

Forty five of the NSI incidents (93.75%) occurred within the hospital setting. For those that occurred outside the hospital, a Consultant and 2 Registrars were involved. All three incidents occurred at home in the process of home treatment of relations.

Two-thirds of the respondents who have had an NSI were wearing gloves at the time of the incident. However, 83.3% of the nurses were not wearing gloves at the time of the incident, compared with 15.15% of doctors who were not wearing gloves.

Twenty five incidents of NSI (52.08%) occurred while intravenous injections were being given (Table 2). Two-thirds of the NSI in Nurses occurred while administering intramuscular injections, with 72.72% of the NSI in doctors from IV injections and all NSI in Laboratory Scientists occurring during phlebotomy. 5 incidents (10.41%) occurred during recapping of needles. All NSI due to suturing happened to consultants in the Surgery Department.

Of the subjects with NSI, 33 out of 48 (68.75%) attributed the incident to carelessness on their own part or not concentrating on the task at hand. Patient aggression (9 out of 48 or 18.75%) and carelessness on the part of a professional colleague (6 out of 48 or 12.5%) were respectively responsible for the remainder of the NSI incidents.

Thirty-seven (77.08%) of the respondents with NSI were pierced by hollow bore injecting needles, with suturing needles and IV cannulae being responsible for NSI in 12.5% and 10.41% of respondents respectively.

Twenty one incidents (43.75%) occurred after the needles had been used, compared with 37.45% before use and 18.75% during use. Three (6.25%) respondents with NSI (2 Consultants and 1 House Officer), took no action after the incident. The commonest intervention was washing the area involved with soap and water (43.75%), while 25% responded by expressing blood from the wound site and washing with alcohol. All those who took any form of action did so immediately.

Thirty-nine of the respondents with NSI (81.25%) were aware of the existence of Post-Exposure Prophylaxis (PEP) services at the hospital, although only 37.5% knew the venue for receiving PEP (Table 3). No respondent knew what telephone numbers to call or the Staff responsible for administering PEP. Thirty (62.5%) of the respondents with

NSI were aware of laid down procedures to follow in the event of an NSI. None of the respondents had been vaccinated against Hepatitis B Virus.

Thirty (62.5%) of the respondents who have had NSI followed up the HIV status of the patient they were attending to at the time of the injury. Twenty five of those with NSI (52.08%) had received formal training on prevention of NSI. However, 57.57% of the doctors and half of the nurses with NSI had not received any training, while all the laboratory scientists who have had NSI had received training.

None of the HCW with NSI incidents reported the event although Incident Registers had just been deployed in the hospital.

DISCUSSION

Safety at the workplace is very important and the reduction of occupational hazards is essential in the healthcare sector where hazards abound.

We observed an NSI frequency of 43.63% which is higher than the 27% obtained in another Nigerian study [4]. A study also in Nigeria reported 62% [5], which is similar to the 64% obtained in a study in Pakistan [6] or 67.9% in Egypt [7]. Our results are indicative of the fact that Needle-stick injuries commonly occur in the hospital setting during work-related activities confirming NSI as an occupational hazard.

Two-thirds of NSI in our study occurred while respondents were wearing gloves, which is not different from a German study in which 70.4% of those with NSI wore gloves [8]. While gloves cannot prevent the occurrence of NSI, their use during procedures could be important in the transmission of infections due to NSI. Our results indicate that nurses generally do not don gloves while administering intra-muscular injections during which most NSI in nurses occur.

In our study 52.08% of the NSI occurred while giving intra-venous injections as different from a study in India in which phlebotomy was the commonest cause of NSI [9]. This calls for greater caution during procedures especially among doctors in whom majority of NSI due to IV injections occur. Caution cannot be over emphasized as majority of the NSI were due to carelessness on the part of the HCW. Despite a strict no-recapping policy adopted by the hospital, recapping is still done as evidenced by the 5 cases of NSI

due to recapping. Recapping of needles has been reported as the commonest cause of NSI in some studies [10, 11].

Although the awareness of Universal precaution guidelines was high (94.54%) compared with a similar study in Pakistan that obtained 21.6% [12], mechanisms should be put in place to maintain this high awareness. Continuous education and application of caution can play an important role in the reduction of NSI to the barest minimum. An NSI can occur at anytime during a procedure involving sharps as observed in our study, so carefulness before, during and after a procedure should be imbibed. Guidelines on the handling of aggressive patients need to be developed and implemented. However, the advanced countries have shifted focus from behaviour to using safety-engineered devices [13].

There is a need to establish functional PEP programmes in health institutions in Africa. Health care workers need to know what to do in the event of an NSI, immediate steps to take, where to go and whom to call. There should be a standardized response to NSI. Formal training on the handling of sharp objects and PEP should be mandatory for all HCW. All HCW should be encouraged to receive vaccination against HBV.

Non-reporting of incidents is worrisome as the true extent of occurrence of NSI would not be known. Reports from other studies have shown high levels of under-reporting of NSI events [8, 14, 15]. Enlightenment campaigns on the importance of reporting all incidents in the hospital should be encouraged.

There is also a need for regular injection safety assessment to estimate the frequency of unsafe injection practices. The NDUTH has just rolled out a robust Risk Management programme which if implemented effectively would help reduce occupational hazards in the hospital.

A limitation of this study did was the exclusion of laboratory technicians, cleaners and workers in the laundry who may come in contact with sharp objects in the course of their duties.

Table 1. Frequency of Needle-stick injuries over time

Time frame	No. of NSI events	Category of staff/no. Involved
Within the past 3 months	15	6 House officers 3 Consultants 1 Registrar 1 Medical officer
within the past 6 months	24	5 Consultants 2 Registrars 2 House officers 2 Laboratory Scientists
Within the past year	12	1 Consultant 2 Registrars 3 Nurses (2 PNOs, 1 midwife)
Within the past 2 years	6	1 Consultant 2 Medical Officers 2 Nurses (2 SNOs) 1 Laboratory Scientist
Greater than 2 years	22	5 Consultants 3 Registrars 3 Medical Officer 9 Nurses

Table 2. Activity undertaken when Needle-stick injury occurred

Procedure	Doctors	Nurses	Laboratory Scientists
IV injection	24	1	-
IM injection	-	8	-
SC injection	1	1	-
Suturing	5	-	-
Recapping	3	2	-
Phlebotomy	-	-	3
Total	33	12	3

Table 3. Training status and knowledge of PEP programme

		Doctors		Nurses		Laboratory Scientists	
		NSI	No NSI	NSI	No NSI	NSI	No NSI
Formal training on needle-stick injuries	Yes	12	18	6	12	3	2
	No	21	13	6	12	0	7
Awareness of the existence of PEP	Yes	25	30	12	18	3	3
	No	8	1	0	6	0	6
Knowledge of where PEP is administered	Yes	14	21	3	9	0	0
	No	19	10	9	15	3	9

CONCLUSION

Needle-stick injuries are common at the NDUTH and are unreported. There is a need for training of all HCW on handling of sharp objects and access to PEP.

REFERENCES

- Centers for Disease Control and Prevention. Workbook for Designing, Implementing and Evaluating a Sharps Injury Prevention Program. 2008, Atlanta.
- World Health Organisation, The world health report, 'Chapter 4 - Selected occupational risks'. 2002: Geneva.
- Beekmann SE Vlahov D, Koizol DE, McShalley ED, Schmitt JM, Henderson DK . Temporal association between implementation of universal precautions and a sustained, progressive decrease in percutaneous exposures to blood. *Clin Infect Dis* 1994, 18(4):562-569.
- Adegboye AA, Moss GB, Soyinka F, Kreiss JK. The epidemiology of needlestick and sharp instrument accidents in a Nigerian hospital. *Infect Control Hosp Epidemiol* 1994, 15(1):27-31.
- Mokuolu OA, Olawumi HO. Needle stick injuries among nurses in a Nigerian tertiary hospital. *Intl J Current Res* 2011, 3(7):12-14.
- Afridi AAK, Kumar A, Sayani R. Needle Stick Injuries Risk and Preventive Factors: A Study among Health Care Workers in Tertiary Care Hospitals in Pakistan. *Global J Health Sci* 2013, 5(4):85-92.
- Hanafi MI, Mohamed AM, Kassem MS, Shawki M. Needlestick injuries among health care workers of University of Alexandria Hospitals. *East Mediterr Health J* 2011, 17(1):26-35.
- Wicker S, Jung J, Allwinn R, Gottschalk R, Rabenau HF. Prevalence and prevention of needlestick injuries among health care workers in a German university hospital. *Int Arch Occup Environ Health* 2008, 81(3):347-354.
- Muralidhar S, Singh PK, Jain RK, Malhotra M, Bala M. Needle stick injuries among health care workers in a tertiary care hospital of India. *Indian J Med Res* 2010, 131:405-410.
- Ebrahimi H, Khosravi A. Needlestick Injuries among Nurses. *J Res Health Sci* 2007, 7(2):56-62.
- Azap A, Ergonul O, Memikoglu KO, Yesilkaya A, Altunsoy A, Bozkurt GY, Tekeli E. Occupational exposure to blood and body fluids among health care workers in Ankara, Turkey. *Am J Infect Control* 2005,

- 33(1):48-52.
12. Siddique K, Mirza S, Tauqir SF, Anwar I, Malik AZ. Knowledge Attitude and Practices regarding Needle stick injuries amongst Healthcare Providers. *Pakistan J Surg* 2008, 24(4):243-248.
 13. Tosini W, Ciotti C, Goyer F, Lolom I, L'He'riteau F, Abiteboul D, Pellissier G, Bouvet E. Needlestick Injury Rates According to Different Types of Safety-Engineered Devices: Results of a French Multicenter Study. *Infect Control Hosp Epidemiol* 2010, 31(4):402-407.
 14. Fullerton M, Gibbons V. Needlestick injuries in a healthcare setting in New Zealand. *The New Zealand Med J* 2011, 124(1335):33-39.
 15. Smith DR, Mihashi M, Adachi Y, Nakashima Y, Ishitake T. Epidemiology of needle stick and sharps injuries among nurses in a Japanese teaching hospital. *J Hosp Infect* 2006, 64:4449.