

# Knowledge, Attitude, Awareness and Practices Regarding Needle Stick Injury Amongst Health Care Workers in a Semi-Urban Hospital in Bayelsa State, Nigeria

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## ABSTRACT

**Introduction:** Needle stick injury is common amongst health care workers, particularly those who perform invasive procedures like collection of blood and insertion of canulae in patients. These pose significant risks of transmission of blood borne pathogens to the Health Care Workers (HCW). The study was designed to assess the knowledge, awareness, and practices regarding needle stick injuries in a sub-urban hospital in Bayelsa state of Nigeria.

**Methods:** One hundred and fifty (150) questionnaires were randomly distributed to HCW working in Otuoke, Ogbia local government area of Bayelsa state, Nigeria, between September and October 2013. Obtained data were analyzed using student chi test, simple descriptive statistics and tables were used to present the results.

**Results:** The result showed that 102 patents (74.45%) had a past history of needle stick injury (NSI). The commonest work setting of HCW who sustained NSI was the Accident and Emergency department 40(39.22%), followed by the ward 33 (32.35%). Recapping the needle (26.47%) and collection of

blood from a patient 23(22.55%) were the commonest cause of NSI. These findings were statistically significant ( $p=0.001$ ).

**Key words:** Needle Stick, Blood Borne Pathogens, Post Exposure Prophylaxis.

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## INTRODUCTION

Needle stick injury (NSI) are wounds sustained when hypodermic needles, sharps and other needle like devices accidentally puncture the skin and other tissues of the body.<sup>1</sup> They pose a significant risk of occupational transmission of blood borne pathogens to the health care workers (HCWs).<sup>1,2</sup>

NSI is relatively common among HCW, especially among those who perform invasive procedures like collection of blood and insertion of canulae regularly.<sup>1-3</sup> NSI often occur suddenly and are work related. They are caused by external and personal factors which result in bodily harm, illness or even the death of the victims.<sup>4</sup> The incidence of NSI is considerably higher than current estimates, due to gross under-reporting (often less than 50%). In the US, it ranges from 600 000-800 000 per year, while in the UK, it is about 100,000 per year.<sup>1,5</sup>

In the majority of cases NSI is self-inflicted (accidental), but less frequently it is caused by either a patient or a colleague.<sup>1-5</sup> This occupational accident often exposes the individual to substantial source of infection with blood borne pathogens.<sup>6</sup>

Various factors such as design of the needle, recapping activities, handling / transferring specimens, collision between HCWs, during clean-up, manipulating needles in patients and failure to dispose needle in puncture proof containers have been known to cause NSI in HCWs.<sup>7</sup> The HCWs are at increased risk of accidental needle stick and sharp injuries, and therefore are prone to blood borne pathogens such as HIV/AIDS, hepatitis B and C, Malaria, Tuberculosis, Syphilis, and other diseases.<sup>1-8</sup>

The reported risk associated with transmission of hepatitis B ranges from 2% (if the source is hepatitis B antigen negative) to 40% if the patient is positive.<sup>9,10</sup> This figure suggests that a sizable number of HCW are at risk of infection with blood borne pathogen after a needle injury. Despite clear guidelines, health care workers generally take inadequate measures following NSI. Few if any, have knowledge about post exposure prophylaxis.<sup>11</sup>

The aim of this prospective study was to assess the knowledge, attitude and practices amongst HCW regarding NSI in a busy Semi-urban hospital in Bayelsa state, Nigeria.

**MATERIAL AND METHODS**

The study was carried out at the Comprehensive Hospital, Otuoke, Bayelsa state Nigeria which is a fifty (50) bed hospital located in Otuoke in Ogbia local Government area of Bayelsa state Nigeria. This was a cross sectional study in which the subjects were randomly selected, and included doctors, nurses, medical laboratory scientists, laboratory technicians, Pharmacists, pharmacist technicians, hospital maids, and cleaners. The study was carried out between September and October, 2013. The subjects were newly employed hospital workers; and those who

have attended a workshop on NSI were excluded from the study. The study was questionnaire based and designed to gather information on the knowledge, attitude, and practices of HCWs regarding NSI and the diseases they transmit. The questionnaire was administered by us within the hospital, and clearance of the study protocol was obtained from the institutional ethics committee before the start of the study. Data obtained were analyzed using student chi square test. Simple descriptive statistics and tables were also used to present the results.

**Table 1: Occupations of respondents.**

S/No	Occupation.	f (%)
1	Doctors.	20(14.60)
2	Nurses	40(29.20)
3	Laboratory Scientists	20( 14.60)
4	Laboratory Technicians	19(13.7)
5	Pharmacists	12(8.76)
6	Pharmacist Technicians	8(5.84)
7	Maids	10(7.30)
8	Cleaners.	8(5.84)
	<b>Total</b>	<b>137(100)</b>

**Table 2: Work setting of HCW who had NSI in the hospital.**

S/No	Units	f (%)
1	Emergency department	40(39.22)
2	Ward.	33(32.35)
3	Laboratory department	16(15.69)
4	Labour room.	8(7.84)
5	Operating theatre	5(4.9)
	<b>Total</b>	<b>102(100)</b>
	<b>Chi-Square (X<sup>2</sup>) (p-value)</b>	<b>52.82 (0.001)*</b>

\*Statistically significant (p<0.05)

**RESULTS**

Out of 150 questionnaires distributed, only 137 were returned. (return rate 91.3%)

Out of the 137 participants, 102 (74.45%) reported having had NSI at least once during their training and clinical practice, while 35 (25.55%) of the study population have not had NSI during their clinical practice. (Table 2)

The highest incidence of NSI occurred among HCWs in the emergency department (39.22%). This is followed by those who had the accident in the ward while carrying out their clinical duties (32.35%).

The least incidence NSI occurred in the operating theatre (4.9%).The findings shows that Emergency department has a statistically significant high incidence of NSI occurring among HCWs compared to the other units.

Recapping of the needle after use was the most common cause of NSI among respondents(26.47%), and this finding was statistically significant (p=0.001). This is followed by collection of blood (22.55%), suturing (17.65%) and insertion of canula (10.80%).

The least cause of NSI was manipulating the needle after insertion in a patient (5.88%).

All respondent (100%) were aware that NSI can transmit the HIV virus, but only the Doctors, Medical Laboratory Scientist, Pharmacist and nurses were aware of the transmission of Hepatitis B and C and other diseases. The hospital maids and cleaner were ignorant about transmission of Hepatitis B, C virus and other diseases.

Washing the site with water and expressing the injured site to let out blood was carried out by all the respondents. Only 19.6% of the affected individuals washed the injured site with antiseptic solution and running water.

No participant reported NSI to the authorities or infection control unit and only 10.8% of the participants were aware of post exposure prophylaxis. Only (11) 10.8% of the study population was aware of the universal precaution guidelines. None obtained the viral serology of the patient on whom the needle was used and none got their viral serology done after the NSI.

**Table 3: Causes of NSI.**

S/No	Activities	f (%)
1	Recapping needle	27(26.47)
2	Collection of blood	23(22.55)
3	Suturing	18(17.65)
4	Insertion of Canulae	11(10.80)
5	Hasty Work	10(9.80)
6	Discarding medical waste	7(6.86)
7	Manipulating needles in patients	6(5.88)
<b>Total</b>		<b>102(100)</b>
<b>Chi-Square (X<sup>2</sup>) (p-value)</b>		<b>23.42 (0.001)*</b>

\*Statistically significant (p<0.05)

**Table 4: The Knowledge of diseases that can be transmitted by NSI.**

S/No	Occupations	Diseases (%)					
		HIV	HBV	HCV	Malaria	Syphilis	Others
1	Doctors	100	100	100	100	100	100
2	Nurses	100	100	100	100	80	80
3	Laboratory Scientists	100	100	100	100	100	100
4	Laboratory Technicians	100	100	100	100	100	80
5	Pharmacists	100	100	100	66.7	33.33	0
6	Pharmacist Technicians	100	75	50	25	20	0
7	Maids	100	0	0	0	0	0
8	Cleaners	100	0	0	0	0	0

**Table 5: Action taken by HCWs after NSI.**

Immediate Action	f(%)
Washing the site with water	102(100)
Expressing the pricked site	102(100)
Washing site with antiseptic solution	20(19.6)
Others(unspecific)	3(2.94)
<b>Late response.</b>	
Reporting incident to infection control unit	0(0)
Knowing the serology of patient	0(0)
HCWs serology after the incidence	0(0)
Having Hepatitis B vaccination	0(0)
Other(unspecific)	0(0)

**DISCUSSION**

NSI are relatively common amongst health care workers.<sup>1-11</sup> Although HCW are those most often affected by NSI, other occupation can be affected such as refuse collectors, cleaners, tattoo artist, and children picking up used needles. The incidence of all injuries varies between occupational groups but is particularly prevalent in those regularly performing invasive procedures like collection of blood and insertion of canula.<sup>11</sup> Ippolito et al<sup>9</sup> have shown that more than 75% of injuries occur while performing everyday activities of patient care and that most of the injuries are self-inflicted 84%, while only 5% are caused by colleagues and 11%, by patients. Our study agrees with this finding since emergency department is often busy, the HCW sustains more injury in that department compared to other departments.

Our finding agrees with Ippolito's observation since majority of the respondents in our study had NSI while working in the emergency department and in the wards that usually experience increase activities of patient care and human traffic. Though our study did not include the source of injury like those outlined by Ippolito, self-inflicted and injury by colleagues may have accounted for the frequent occurrence of NSI in the ward and the emergency units. In a study conducted in Italy, nurses were the most commonly affected by NSI, and study conducted in Scotland shows the ward to be the commonest work place where NSI occurs.<sup>9,19</sup> This is slightly in variance with our finding since the NSI I occurred more in the Accident and emergency department in our series. They carried out their studies on the nurses, and no other segments of the HCWs were included in their series. This may account for the differences in our findings.

The incidence of NSI injury is considerably higher than currently estimated; due to gross under-reporting (often less than 50%).<sup>10-12</sup> Published reports estimate the global incidence of NSI among medical students to be between 12-50%. In a study of 339 interns and medical students, 41.2% had experienced at least one NSI.<sup>13</sup> Our result (74.45%) was higher than these figure because apart from doctors and nurses other paramedical staff were included. This could have accounted for the high incidence rate of NSI in our series. Majority of the respondents, 106 (77.37%) were aware of the dangers associated with NSI, but only the medical doctors, nurses, laboratory scientist have in-depth knowledge of the spectrum of diseases that could be caused by NSI. Apart from HIV, maids and cleaners were ignorant about other diseases like Hepatitis B and C that could be transmitted through NSI. This finding no doubt, places significant number of HCWs 31(22.63%) to blood borne diseases and its consequences. It is important therefore for the Health care providers who have occupational exposure to blood to know that they are at risk for acquiring blood borne infections.<sup>1-19</sup>

In a busy hospital set-up, certain clinical activities such as recapping of needles after use were related more to the likelihood of the HCW being injured by a needle or other sharp object. Sumathi et al in their study, condemned the practice of recapping and pointed out that inadequate training of HCWs, or their refusal to follow correct procedure may be responsible for these injuries.<sup>1</sup> Our findings agrees with those of Sumathi et al. Although recapping of the needles (26.47%) was the commonest cause of NSI in our series, our figure was slightly less than those of their study where recapping of the needle after use accounted for 39% of all respondents.

The dearth in knowledge of post exposure prophylaxis among the study population was highlighted in our study. Only 12(11.8%) of the respondent have knowledge regarding post exposure prophylaxis. This agrees with the work of Cervini and Bells, who have shown in their study that post-exposure practices are inadequate among medical students.<sup>19,20</sup> Our series was a randomized cross-sectional study among HCWs, this could account for the poor knowledge of post-exposure prophylaxis among the studied population, as compared to their population that was based mainly on medical students.

Although, the overall knowledge regarding the potential of transmission of HIV is high among health workers, their knowledge of the transmission of other diseases like hepatitis B and C are low. These pose a significant risk to the HCWs. Again none of the HCW was vaccinated against the diseases like Hepatitis B, despite the availability of the vaccines. This reflects lack of awareness, formal training or careless attitude among the HCWs. There is need therefore, to re-orientate and train all employed HCW in universal precaution guidelines and handling of sharps.

It is important that individuals in the health care field become well informed about the exposure risks and educated regarding the appropriate response to take after exposure. Our study has shown that although HCWs take adequate measure immediately after NSI (washing the site with water/antiseptic solution and expressing the site), they seem not to know the value of post exposure prophylaxis in prevention of HIV, hepatitis B virus and hepatitis C virus infection. This is contrary to the report from other

studies.<sup>1-23</sup> where majority of HCWs report the incidence especially when the injury involves a high risk patient.

The high incidence of underreporting in our series and the nearly absence of knowledge about post-exposure prophylaxis may be related to the lack of understanding about the danger posed by NSI to the HCWs. Therefore, regular educational activities and creation of awareness organized by the infection control unit is necessary for all employed HCWs. In studies carried out in the USA, it was pointed out that educational programs and the use of modern equipment can significantly reduce the incidence of NSI among HCWs.<sup>21,22</sup>

## CONCLUSION

The findings of this study show that NSI is common among the HCWS, it is grossly underreported and majority of HCWS do not understand the danger posed by NSI, therefore, infection control teaching and training should be an integral part of orientation of all hospital workers. The teaching should incorporate exposure risk and the appropriate response in the event of injury. Strategies aimed at improving reporting system and creating a culture of reporting should be thought and implemented by all health facilities. Prophylactic immunization of susceptible staff should be encouraged.

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