

Needlestick injury: Audit report of compliance with an American Nurse Association guideline in a private hospital, Sudan

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Abstract:

Background: Every day, health care workers are exposed to dangerous and deadly blood borne pathogens through contaminated needle sticks. Therefore, there is an increasing need for health care workers to adhere to universal safety precautions in order to avoid these injuries. The aim of this study is to measure the current practice of health care workers regarding needlestick injuries in relation to latest post-exposure assessment, prophylaxis, and treatment guidelines published by the American Nurses Association and to identify any area of potential improvement.

Material and Methods: A retrospective audit assessing the current practice following needlestick injuries in a private hospital in Sudan. A total of 105 health care workers were audited over one month period using datasheet.

Results: Out of 105 health care workers who audited during September 2019, 44 health care workers experienced accidental needlestick injuries in their workplaces. Cleaning the injury site with antiseptic sterilizer was the most frequent used first aid seen in 60% while washing with soap and water were found only in 40%. 57% of exposed health care workers reported their injuries to hospital care system. The source of needle was identified in 73%. Serological marker and virology screening for Hepatitis B Virus, Hepatitis C Virus and Human Immune Deficiency Virus were unknown in 25%. The rapid test for the 3 major viruses was not done by 43% of injured health care workers. Only 23% of exposed health care workers started the post exposure prophylaxis within 2 hours of injury.

Conclusion: The audit results showed high percentage of health care workers who experienced needlestick injuries; nurses were the most common to be affected. Due to large numbers of health care workers's inadequate knowledge and malpractice in dealing with needle injury, training programs on the best practice following exposure seems essential.

Keywords: Needlesticks injuries, Audit, Sudan

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I. Introduction

The National Institute for Occupational Safety and Health (NIOSH) USA defines needlestick injuries (NSIs) as "injuries that are caused by objects such as hypodermic needles, blood collection needles; cannula and needles used to connect parts of IV delivery systems [1]. Every day, health care workers (HCWs) are at risk of serious occupational hazard by contaminated needles [2]. Hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) are the most common blood-borne pathogens transmitted through infected needles injury [3]. A study done by World Health Organization in 2002 found that contaminated sharp object lead to around 3 million needlestick injury among HCWs [4]. As a result of these exposures, there were an estimated 66,000 HBV infections, 16,000 infections with HCV and 1,000 were infected with HIV, resulting in 1100 deaths or significant disability [4].

Needles that lack safety characteristics, not following the standard protocols and not adherence with safety precaution are known to increase the risk for needle injury [5]. Therefore, there is an increasing need for HCWs to adhere to universal safety precautions and safety devices in order to avoid injuries from infected needles [6].

In this study, we used the American Nurse Association (ANA) guideline which was established to protect nurses and other health care workers from NSIs and infections associated with [7].

Aims

- To measure the current practice of HCWs regarding NSIs related to the latest post-exposure assessment, prophylaxis, and treatment guidelines published by the American Nurses Association in a private hospital in Sudan and to identify any area of potential improvement.
- To ensure all HCWs are aware of the high risk of getting blood-borne infections from accidental NSIs in their workplaces.

Audit Standard

The standard was the ANA guideline which documents taking the following immediate actions when sustaining NSIs [7]:

- “Wash the injury site with soap and water immediately”.
- “Alert your supervisor and initiate the injury reporting system used in your workplace”.
 - “Identify the source patient, who should be tested for HIV, hepatitis B, and hepatitis C infections”.
 - “Get tested immediately for HIV, hepatitis B, and hepatitis C infections”.
 - “Get post-exposure prophylaxis (PEP) when the source patient is unknown or tests positive for HIV, hepatitis B, and hepatitis C”.
 - “Get a follow-up, post-exposure testing at six weeks, three months, and six months, and depending on the risk, at one year”.

II. Material and Methods

A retrospective study assessed the current practice following NSIs among HCWs in a private hospital in Sudan, focusing on high-risk groups such as nurses and laboratory technicians during September 2019. Over one month, a total of 105 HCWs were audited. The hospital human resources department provided us with a list of relevant HCWs. The cases were selected randomly. The data was collected using datasheet form and assessed against the current standard of NSIs prevention guideline (ANA guideline).

Study Design: Retrospective observational study

Study location: Private Hospital in Sudan

Study duration: September 2019

Sample size: 105 Health Care Workers

Inclusion criteria: Nurses, Lab technicians, Doctors, Anesthetist and Hospital waste disposal staff during the period of the study and who agreed to fill the datasheet form.

Exclusion criteria: Pharmacists and other workers in the hospital who don't have a direct contact with blood and blood products.

Statistical Analysis: Data was analyzed using Microsoft Excel.

III. Results

Of the 105 audited HCWs, 42 % (N, 44) HCWs experienced an accidental NSIs in their workplaces. (See table 1). Two-thirds (63%) of HCWs who experienced NSIs were nurses. Only about 8% of all HCWs who experienced NSIs were laboratory technicians. The intensive care unit was the most common location for needle injury to occur (36.4%), whereas the ward, theater, and emergency room were less common places at 25%, 18.2%, and 13.6% respectively (figure 1). Less than one-half of the causes were needle injection (45.5%), and one-fourth were caused by needle recapping (25%)(figure 2). More than half of HCWs (59.1%) who experienced needle injuries reported immediately washing their hands with soap and water as the first and most important step.

Less than one-third (30%) of HCWs were not fully vaccinated against HBV (51, 6% were nurses). Majorities (78%) of HCWs were aware of and used personal protective equipment (PPE) while handling blood or body secretion, the remainder reported forgetfulness and high workload as the most important reasons for not using PPEs. Many nurses were not familiar with the exact time and conditions to initiate post-exposure prophylaxis (PEP).

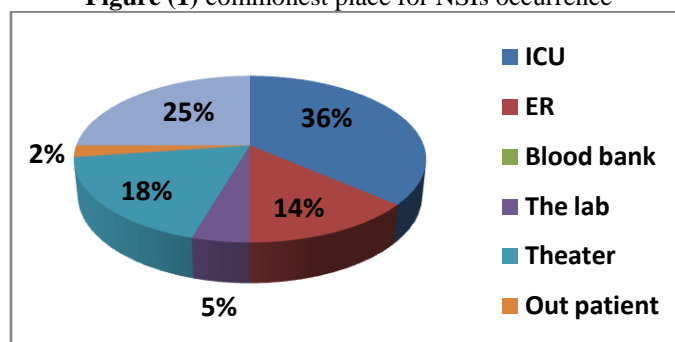
Audit criteria results

Cleaning the injury site with antiseptic sterilizer was the most frequently used first aid and was seen in 60% of cases while washing with soap and water was found in 40%. Slightly more than half (57%) of exposed HCWs reported their injuries to the hospital care system. High work load and busyness were the leading causes of unreported cases.

The source of the needle was identified in 73% of cases. Serological marker and virology screening for HBV, HCV, and HIV was unknown in 25%. The rapid test for the three major viruses was not done by 43% of the HCWs.

Less than one-fourth (23%) of exposed HCWs started the PEP within 2 hours of injury, while 68% did not begin PEP. A follow-up plan was not completed until one year by 70% of HCWs (table 2).

Figure (1) commonest place for NSIs occurrence



ICU= Intensive care unit
ER= Emergency room

Figure (2) Procedure exposed health care workers to NSIs

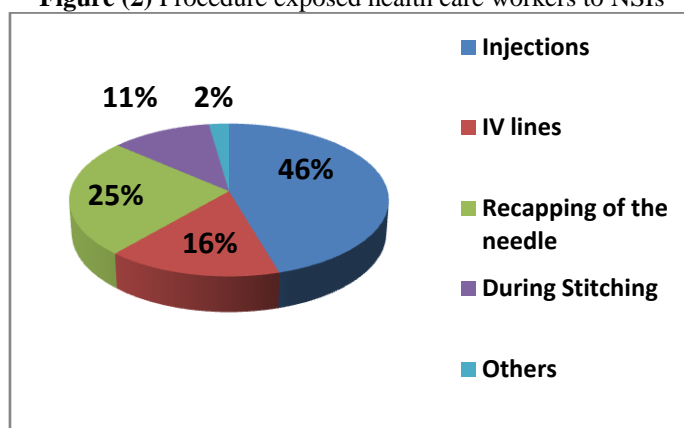


Table (1) Health care workers experienced NSIs

Total number of HCWs (N=105)	HCWs who experienced NSIs in number and percentage (44cases)
Nurses (N=53)	28(52.8%)
Doctors (N=19)	8(42.1%)
Lab technicians (N=17)	3(17.6%)
Hospital waste disposal staff (N=12)	3(25%)
Anesthetist (N=4)	2(50%)

Table (2) Audit criteria

Audit criteria	Audit result (whom met the criteria)
All health care workers exposed to NSIs should wash injury site with soap and water immediately	18 (40, 9 %)
All health care workers exposed to NSIs reported their injuries to the hospital care system	25 (56, 8 %)
All health care workers exposed to NSIs were able to identify to source of the needle	32 (72, 7 %)
All health care workers exposed to NSIs did the rapid test for HBV, HCV and HIV	25 (56, 8 %)
All health care workers exposed to NSIs started the PEP within 2 hours of injury	10 (22, 7 %)
All health care workers exposed to NSIs got a follow up plan till one year	13 (29, 5 %)

IV. Discussion

One of the most common neglected problems among HCWs is NSIs. The prevalence of NSIs in this study was 42% which is near to two studies conducted in Malaysian teaching hospitals 31.6% and 52.9% respectively [8]. This result was less than a study from India (79.5%) [9]. The most common location of NSIs was the intensive care unit (36.4%) followed by ward (25%), theater (18.2%) and emergency room (13.6%), while a study from India showed that the ward/nursing rooms were the most common locations (45.5%) then intensive care unit (27.3%) and operating rooms (18.2%) [10]. Recapping of the needle was the responsible cause in 25%, which similar to other Indian study (20%) [11]. The three doses of HBV vaccine were accomplished by 70% of HCWs which is closed similar to 57.1% in Indian study [11].

Washing the injury site with Soap and water and PEP prophylaxis was practiced by 40% and 23% of HCWs, this was less than a study from India showed 95.7% and 86.3% respectively [11]. Another Indian study showed that 60.9 % of HCWs used soap and water to clean the injury site and 7.8% took PEP [12].

V. Conclusion

The audit results had a high percentage of HCWs who experienced NSIs; nurses were the most affected. The intensive care unit was the most common place for occurrence. Needle injection was the most frequently cited procedure responsible. A small percentage of HCWs practiced the correct method for washing injury sites and suitable time to start PEP. The concepts of needle injury report and follow up plan were missed among most of HCWs. A significant number of nurses were not fully vaccinated against HBV.

We recommend the following

- To address inadequate knowledge and practice of appropriate steps to take following a needle injury; workshops, and training programs on best practices following exposure is essential.
- Implementing safety training programs that emphasize prevention and mandatory reporting may be effective in reducing needle injuries and minimizing blood-borne pathogen transmission.
- Also, NSIs recorded on unique forms that document their causes should be regularly checked by the hospital's infection control department.
- As there are a considerable number of HCWs who were not fully vaccinated against HBV, increasing attention in these issues is advisable.
- Finally, conducting random audits will ensure best practices are followed.

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