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Needle stick injuries and its impact among healthcare worker and – A Review

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Abstract

Needle stick injury - "Sleeping threat to health care worker" Health care workers face a wide range of hazards in the health care setting including sharp injuries. Needle stick injuries are the most common occupational injuries for the health care workers. Healthcare plays a vital role in our daily life to make it clear health industry has to be always dynamic, with medical break through every day to stay ahead not only in advanced technologies but also in education, training, performance and monitoring. knowledge is necessary for healthcare worker should be safe endowing and sustaining to improve healthcare for all. Many infectious diseases can be transmitted through injuries. Of most important are virus infections like human immunodeficiency (HIV), hepatitis C (HCV) and hepatitis B (HBV). Health workers are nurses the most affected . Needle stick injury is considered highly under reported. The world health organization and the International Council of Nurses introduced a pilot Project to decrease needle stick injury among health workers. Policies and methods of prevention of needle stick injury were distributed worldwide. Although WHO needle stick injury policies are recognized in Saudi Arabia, they are not implemented properly. This assignment will review the health issue of injuries and infectious diseases produced by needle stick injuries internationally and in Saudi Arabia (NGH). Needle Stick Injury (NSI) is a percutaneous piercing wound typically dealing with sharps. Needle stick injuries are the most common health care workers issue worldwide. In this review paper importance of needle stick injuries and its prevention are discussed.

Keyword: Needle stick injuries, prevention, knowledge, healthcare worker

Introduction

A Needle stick injury is a percutaneous piercing wound typically set by a needle point, but possibly also by other sharp instruments or objects. Commonly encountered by people is the handling of needles in the medical setting, such injuries are an occupational hazard in the medical community. Occupational needle stick injuries are mainly focused on the healthcare environment, but law enforcement is at particularly high risk for incidental needle sticks, though this population is commonly overlooked. Healthcare worker plays very vital role in health care settings because their concentration lies in patient care. Needle stick injuries injury has been recognized as a source of exposure to blood borne pathogens such as hepatitis B virus hepatitis C virus and human immunodeficiency virus for health care workers. It has been estimated by the Center Disease Control that every year more than three million health care members are exposed to blood and body fluids via sharp and mucocutaneous injuries in the United States alone with an annual estimated 6 million Needle Stick Injuries.

The occupational exposure to NSIs are considered to much are considered to be much higher in the in the developing world and much of the cases are not even reported . it is expected that around 75% of the NSIs in developing countries are not reported. Globally , there is gross under – reporting of NSIs with the actual incidence of NSIs being much higher than those reported. Healthcare institution must be careful not to interpret or understand the low reporting rate as low rate of injury.

prevention is defined as any intervention or methods intended to lessen the possibility that a person would contract and illness or disorder, as well as to stop or reduce the progression of a disorder lowering the rate of disability. To decrease the burden of disease and their related factors, disease prevention can also be defined as targeted, population and individual based interventions for primary and secondary prevention. Primary prevention prefer to the measure which are taken to prevent the onset of any disability or disease. This may include the actions to improve health through changing the impact of social and economic determinants on health; the provision of information on behavioural and medical health risk ; consultation and measure to decrease them at personal and community level ; providing education; clinical preventive services .

Background

Since mid-1840s when the first needle was used through today, this essential part of healthcare provision has been a source of occupational injury for healthcare providers (HCPs). Disposable syringe which became available in early 1960s reduced the burden slightly as the need to sterilize and reuse the same syringe was no longer required. In 1978, a medical technician at the University of Wisconsin Hospital in Madison, WI, Seroconverted to hepatitis B after occupational exposure to Hepatitis B from an accidental needle stick injury. This sentinel event lead Dr. Dennis Maki and Ms. Rita Mc Cormick, RN, CIC, to perform ground breaking research that brought the hazards of needle stick injury to the attention of the medical community. In their report, published in 1981, Maki and McCormick found that the most important cause of needle stick injuries was recapping attempts, and warned HCPs not to recap needles. Despite the knowledge and awareness of the problem in the medical community, HBV and other blood borne pathogens frequently spread by accidental needle stick injuries.

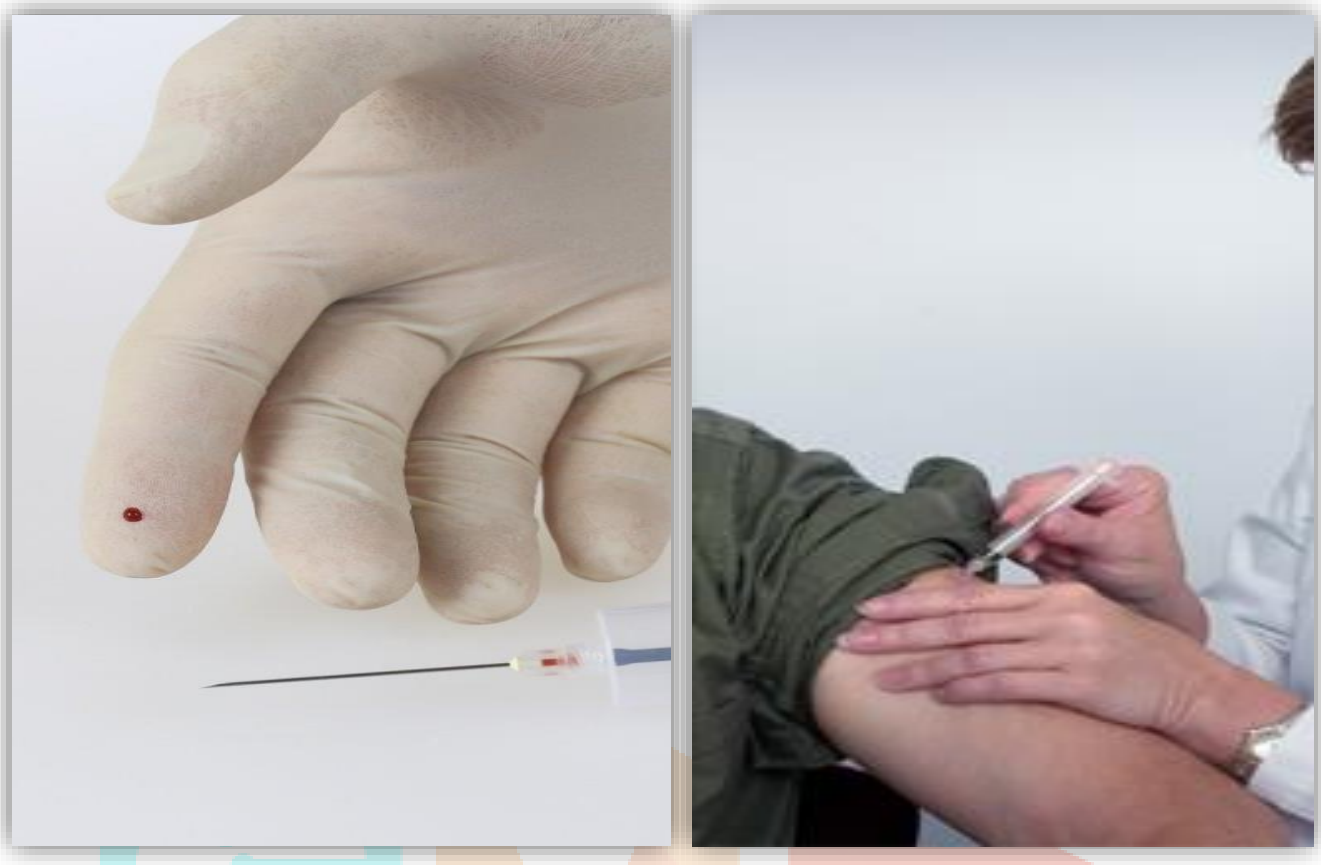

figure 1 : Accidental Needle stick injuries

factors associated with needle stick injury

Needle stick injuries (NSIs) are a major occupational hazard for health care worker. Global needle stick injuries prevalence rate of roughly 36.4% among health care workers. In India specifically, career prevalence ranges from 61% to 79.5%, with average annual rates of 2.3 to 4.5 injuries per health care worker. Underreporting despite the high risk of blood borne infections (like HIV, Hepatitis B and Hepatitis C), up to 50% to 80% of NSIs go unreported by staff. prevention can also be defined as targeted, population and individual based interventions for primary and secondary prevention. Primary prevention prefers to the measure which are taken to prevent the onset of any disability or disease. This may include the actions to improve health through changing the impact of social and economic determinants on health; the provision of information on behavioural and medical health risk; consultation and measure to decrease them at personal and community level; providing education; clinical preventive services; post exposures measures for healthcare worker exposed to the injury. Secondary prevention includes the early detection of the problem or associated factors. It focuses on the improvement of the likelihood of positive health outcomes. This includes initiatives like evidenced based screening for NSIs and prevention of the disability caused by it. It also includes findings out the interventions or method which could be effective when used at an early stage of disease. NSIs lead to a risk of developing various types of infections and healthcare providers are always under serious threat. The main problem because of underreporting of NSIs is that the people who are exposed could not be given postexposure prophylaxis (PEP) at appropriate time to prevent the development of infection in the person who has experienced NSI. For example, PEP for HIV is shown to be 80% effective in preventing the development of the infection. The risk of transmission of blood-borne infections, such as Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and Hepatitis C Virus (HCV), are common in NSIs, and thus, safety practices and guidelines must be practiced by all healthcare providers to protect themselves from infection. The risk of infection for different diseases varies highly. Due to

NSI the risk of infection varies from 0.5% to 40% for HIV and HBV infections, respectively.There is evidence of best practices that should be followed to avoid NSIs. However, the knowledge about them among the healthcare providers and their implementation seems to be very less. Although published evidence recommend that contaminated needles should not be recapped, but studies from developed countries, such as the United States, showed that recapping of needles is occurring commonly among the healthcare workers. NSIs have the potential to affect the health system both directly and indirectly. In developing countries with limited human resources for health, there are higher restrictions in the number of available doctors and nurses. NSIs and other health-related occupational injuries affect the health services provided by increasing the number of work days lost due to injuries and the emotional distress, which are caused to the healthcare providers due to NSIs.

Figure 2: When do sharps injuries occur

The Ministry of Health and Family Welfare of the Government of India recommends that the healthcare providers must be made aware of the safety precautions that must be followed for the prevention of NSIs. Adequate training to the healthcare workers to handle the sharp objects is also equally vital. In addition to provision of information to healthcare providers and adequate training to them, effective reporting systems should be placed in all healthcare facilities for early reporting of cases and immediate actions to be taken to address the issue by providing adequate PEP and treatment. PEP can be initiated only if there is adequate and fast reporting of data. Some institutions in India maintain a staff health service facility, which registers all cases of NSIs and holds a record for them and have safety protocols in place to manage them and adequately monitor if the cases are being reduced. Safety protocols should be always in place in all hospitals and healthcare facilities to prevent the risk of NSIs and for the enforcement of safety precautions and immediate actions to be taken in the case of any exposures. There are limited data about the prevalence and attributes of NSIs in the different healthcare settings in India.

Prevention

More than 80% of needle stick injuries are preventable with the use of safe needle device Primary prevention is the replacement of the risk with a less hazardous substitute. In the case of blood and body fluid, it would require replacement of needles and other sharps . This is not always possible but should be implemented where applicable with needle free connectors, blunt needle cannulas, and adhesive strips to close wounds . Needles and other sharps would always be present in one form or another in the healthcare facility. Secondary prevention methods add active or passive safety features such as shielding in the case of needles and other sharps. According to the CDC, one quarter of the injuries happen when the protective device was not activated(8). Proactive approaches should include immunization for HBV awareness campaigns, and training of HCPs regarding the grave consequences of letting blood and body fluid exposures go unreported . The U.S Occupational safety and health administration (OSHA) is responsible for regulating employers under the blood borne pathogens standards and needlestick safety and prevention act.The centers for disease control estimates that as many as 88 % of all sharps injuries could be prevented through the use of safer medical equipments and better operating procedures.

Effective Post-Exposure Management

There are many different protocols for post exposure management of needle stick injuries to blood and body fluids. The Centre for Disease Control (CDC), the World Health Organization (WHO), other organizations as well as institutions such as academic hospitals have their own protocols.

General Principles

Initiation of post exposure management to blood and body fluids by needle stick or sharps injury depends on timely reporting of the incident. HIV prophylaxis has the smallest window of time. The treatment has to be started as soon as possible, within the first few hours. After 72 hours most protocols recommend not to initiate HIV prophylaxis. HBV Immunoglobulin (HBIg) could be given within the first seven days and has been shown to be 75% effective in preventing seroconversion. Perceived severity of communicable infections, the perceived efficacy of reporting injuries, and overall motivation to maintain health were the best predictors of reporting compliance.

Non-compliant personnel when surveyed emphasized the negative aspects of reporting occupational injuries, mainly that it “takes a lot of time.” The solution to non-compliance of reporting occupational injuries is to invest in training and education designed to sensitize the healthcare providers to the importance of reporting, and its effect on strategic planning to safeguard their health. health were the best predictors of reporting compliance. Non-compliant personnel when surveyed emphasized the negative aspects of reporting occupational injuries, mainly that it “takes a lot of time.” The solution to non compliance of reporting occupational injuries is to invest in training and education designed to sensitize the healthcare providers to the importance of reporting, and its effect on strategic planning to safeguard their health . Physicians are least likely to report a needle stick injury compared to other healthcare providers. According to this protocol, when there is a blood and body fluid exposure the following routine is followed both the source (patient) and staff (individual exposed). Each are assessed for their immune status for HBV, HCV, and HIV. If the source is negative for HBV, HCV, and HIV no further follow-up is mandated. If the source is positive for HBV and the staff has antibody titers for HBV below 10 IU post exposure, prophylaxis (PEP) is started immediately. Both HBV

immune globulin (HBIG) and HBV vaccine is given immediately. The second dose of HBIG and HBV vaccine is given four weeks later, followed by the third dose of vaccine at six months from the initial dose. In case the source is positive for HCV, the staff member would be followed to assess if they require treatment according to the protocol which is HCV PCR six week after the exposure with follow up blood work for HCV antibodies and LFTs at three and six months. Advisory Committee on Immunization Practices (ACIP) in 1994 reviewed the available data regarding the prevention of HCV infection with immunoglobulin (IG) as a post exposure prophylactic treatment for HCV exposure. ACIP concluded that they would not support IG or interferon as PEP for HCV . Blood tests are requested for follow up according to the protocol.

Role of Employers

Policy guidelines should be developed by healthcare facilities for safe working practices for patients with HBV, HCV, HIV infection and AIDS, and should be disseminated across all occupational groups to reduce negative staff attitudes and improve knowledge of occupational transmission. This will establish an appropriate perception of risk, and create a supportive and caring hospital environment for people with HBV , HCV , and HIV. Managers play an integral role in disseminating the policy guidelines and information to all staff on an ongoing basis (11). Healthcare employers should try to develop policies and procedures to reduce needle stick injuries by proactively vaccinating all HCPs for HBV, and incorporating improved engineering controls into a comprehensive needle stick injury prevention program.

Conclusion

This review article characterizes about the needle stick injuries among healthcare worker and its prevention. It delineates that the knowledge of needle stick injuries , prevention of needle stick injuries and achieve positive health outcomes.

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