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# Awareness of operating room personnel's towards HBV/HIV at Omdurman teaching hospital, Sudan

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## Abstract

*Background*: Operating room personnel's are at risk to blood and body fluid (BBF) of patients, through accidental sharps and needle stick injuries. Preventive measure, awareness, reporting of incidence and post exposure prophylaxis (PEP) are ways to avoid mortality and morbidity. Objectives: To assess the level of awareness regarding HIV/HBV among operating room surgical personnel. Methodology: This is a prospective observational study, conducted at Omdurman Teaching Hospital during a period from June - Nov 2012. Study population was operating room personnel's. The collected data was analyzed using SPSS computer package version 19. Results: Participants were 88; medical staff 77.3%, while the paramedics 22.7%. Almost 96% of the participants agreed that they will apply the standard precaution measures when operating on known HBV/HIV patients. On accidental NSI, over 90% of the operating room personnel's (ORP) will adopt the simple PEP. Reporting the incidence to the infection control department (ICD) of the hospital will be done by 64.8%. On sharp injury 23% mention they will test the blood of the patient only. More than 40% of the ORP didn't complete their HBV vaccination only 37% of the house-surgeons were vaccinated. HIV/HBV prevention program was attended by 28.4% ll'111of the ORP. Conclusion: There is fair level of awareness among medical doctors and paramedics towards universal precautions and needle stick injuries. The knowledge of PEP needs to be emphasized. Clear policy for reporting and protocol for PEP are needed. Vaccination coverage is very poor.

## Keywords

Awareness, HIV, HBV, Post Exposure Prophylaxis, Universal Precaution

## 1. Introduction

The average risk for HIV transmission after a percutaneous exposure to a blood sample positive for HIV is approximately 0.3%. It is almost 0.09% after a mucous membrane exposure [(1)]. The risk of developing clinical hepatitis after percutaneous exposure to a blood sample positive for both hepatitis B surface antigen (HBs Ag) and HBe Ag is 22% to 31% [(2)]. It has been estimated that 14.4% and 1.4% of hospital workers are infected with HBV and HCV, respectively [(3)]. Health care workers in surgical departments were most commonly affected by needle stick injuries than others, due to their increased exposure to sharps while operating or working in emergency room or out patient's department [(4, 5)]. The frequency of NSIs significantly higher among doctors 72% at least once during their clinical practice [(6)].The most common reason identified for NSI among both doctors and nurses was stress/being overburdened 41% followed by carelessness 38% [(6)]. The most frequent setting for blood and body fluid (BBF) exposures among senior doctors was the operating theatre 59%. It was suturing in 41% and cutting in 16% of the occasion. The risk of BBF exposure for junior doctors is three times higher than that for senior doctors [(7)]. Several preventive measures have been proposed including pre-

exposure and post-exposure [8]. The aim of the present study was to assess the present level of awareness regarding HIV/HBV and the appropriate precautions required, among operating room surgical personnel.

## 2. Methodology

This is a prospective observational study, conducted at Omdurman Teaching Hospital during a period from June - Nov 2012. Sampling was done by total coverage of the surgical staffs, in direct contact with the patients, working in the elective surgery department and not in annual vacation after accepting the given informed consent. A pre-designed, pretested questionnaire was used. The variables were performance and importance of preoperative screening of patients, precautions and measures regarding needle sticks injuries (NSI) and post exposure prophylaxis (PEP). Attendance of hepatitis B virus (HBV)/human immunodeficiency virus (HIV) preventive program and the status of HBV vaccination were also considered. The collected data were processed and analyzed statistically using SPSS computer package version 19.

## 3. Results

The questionnaire was distributed to 129 surgical personnel's working in the operation rooms, 102 responded with rate of 79%. Of the responders 14 (13.7) were partially filled and were excluded from the study. Medical staff participation constitutes 77.3% while the paramedics 22.7%. Among the 88 participants, 13 (14.8%) were surgeons, 27 (30.7%) were house surgeons and 13 (14.8%) scrub nurses as shown in Table 1.

***Table 1.*** *Distribution of the surgical personnel of the operation room in the study*

| Profession | Frequency | Per cent |
|---|---|---|
| Surgeon | 13 | 14.8 |
| Anaesthetist | 02 | 02.3 |
| Registrar | 16 | 18.2 |
| Medical officer | 10 | 11.4 |
| House officer | 27 | 30.7 |
| Scrub nurse | 13 | 14.8 |
| Assistant Anaesthetist | 07 | 08.0 |
| **Total** | **88** | **100.0** |

There is a discrepancy between knowledge and practice regarding routine preoperative testing of patients for HBV/HIV among the surgical staff in this study. The importance of screening all patients before surgery is recommended by 98% of the participants whereas the test was not performed routinely by 62 (82.7%) of the surgical workforce. Almost 96% of the participants agreed that they will apply the standard precaution measures when operating on known HBV/HIV patients Table 2.

***Table 2.*** *Performance and importance of preoperative screening of patients for HBV/HIV*

| | |
|---|---|
| **Do you perform routine preoperatively screening of your patients for HBV/HIV?** | |
| Yes | 13 (17.3%) |
| No | 62 (82.7%) |
| Total | 75 (100.0%) |
| **Is patient screening important before surgery?** | |
| Yes | 86 (97.7%) |
| No | 02 (2.3%) |
| Total | 88 (100%) |
| **Will you apply the standard precautions when you operate in a known positive patient?** | |
| Yes | 74 (96.10%) |
| No | 03 (3.9%) |
| Total | 77 (100%) |

On accidental NSI, 74 (96%) of the operating room personnel's (ORP) will adopt the simple immediate nonspecific measures of PEP. These procedures include 95.5% of changing the gloves, 97.7% letting the site of injury to bleed, 90.9% wash hands with water. Reporting the incidence to the infection control department (ICD) of the hospital is stated by 64.8% of the participants Table 3. An important difference was seen between the medical (consultants and junior doctors) and non-medical (assistant anaesthetists and theatre nurses) groups in terms of knowledge of changing gloves on needle stick injury, 1.5% vs. 15% will not change them. Reporting by surgeons, registrars, medical officers and house surgeons was stated in 53.8%, 62%, 60% and 20% respectively. When inflected by NSI during surgery, 92% of the participants stated, screening is mandatory, where as 23% of the surgeons and 6% of the registrars mentioned the reverse. Who to screen in this instance? The response was to screen the patient only in 23%, the exposed ORP in 7.4% and both in 69.1%. Thirty per cent of the surgeons mentioned that they will screen the patient only, 6.7% registrars, 40% medical officers and 18.5% of the house surgeons answer the same. To be screened once was indicated by 38.3% of the participants. Post exposure medication is perceived by 76 (93.8%) of the responders to be important if the patient test turn positive and they are willing to receive treatment. All surgeons stated that they will receive the medication, but 6.7% of the registrars, 11.1% of the medical officers and 3.7% of the house surgeons answer negatively Table 4.

***Table 3.*** *Simple immediate measures on needle stick injuries*

| | |
|---|---|
| **Is precaution needed when you have NSI during surgery?** | |
| Yes | 74 (96.10%) |
| No | 03 (03.9%) |
| Total | 77 (100%) |
| **What precaution you will adopt in case of NSI?** | |
| Change gloves | Yes 84 (95.5%) |
| Let site of prick to ooze | Yes 86 (97.7%) |
| Washing hands with water | Yes 80 (90.9%) |
| Report to the ICD | Yes 57 (64.8%) |

***Table 4.*** *Screening on needle stick injuries and importance of post exposure prophylaxis*

| | |
|---|---|
| **Is screening mandatory when you inflect NSI during surgery?** | |
| Yes | 81 (92.0%) |
| No | 07 (08%) |
| Total | 88 (100%) |
| **Whom to screen in case of NSI?** | |
| Patient alone | Yes 19 (23.5%) |
| Yourself alone | Yes 06 (07.4%) |
| Both | Yes 56 (69.1%) |
| Total | Yes 81 (100%) |
| **How many times is the screening?** | |
| Once | Yes 31 (38.3%) |
| Many times | Yes 50 (61.7%) |
| Total | Yes 81 (100%) |
| **If patient tested positive will you receive post exposure medication?** | |
| Yes | 76 (93.8%) |
| No | 05 (06.2%) |
| Total | 81 (100.0%) |

More than 40% of the ORP at Omdurman Teaching Hospital didn't have or completed their HBV vaccination. Fifty two per cent of the surgical doctors were vaccinated compared to 65% of the paramedics. From the former group the vaccination status of the surgeons, registrars, medical officers and the house surgeons was, 69%, 75%, 50% and 37% respectively. Worth mentioning none of the anaesthetists were neither vaccinated nor attend a preventive program.

Only 28.4% of the ORP had attended HIV/HBV prevention program. The attendance of the paramedics was 10% however that of the surgical doctors was 41% Table 5.

***Table 5.*** *Vaccination status of the surgical personnel in the operation room and attendance of preventive program*

| | |
|---|---|
| **Have you completed your HBV vaccination?** | |
| Yes | 49 (55.7%) |
| No | 39 (44.3%) |
| Total | 88 (100%) |
| **Did you attend HIV or HBV prevention program?** | |
| Yes | 25 (28.4%) |
| No | 63 (71.6%) |
| Total | 88 (100%) |

# 4. Discussion

## 4.1. Precautions on Needle Stick Injuries

Universal precaution guidelines are recommended for the care delivery to all patients, regardless of their presumed infection state [(9)]. Our study demonstrates a high level of knowledge 98% regarding their application when operating in a known case; still this is higher than reported in other studies 13% [(4)] and 61% [(10)]. Lower level of awareness when the case is not known is evident in our study. Mehta found NSI of the ORP were sustained from operating theatre instruments, during disposal of needles, using surgical blades, suturing and from miscellaneous sources [(11)].

## 4.2. First Aids

The following actions are recommended immediately following any exposure to blood/body fluids (BBF) regardless of whether the source is known or not to pose a risk of infection for HIV, HBV and/or HCV. Free bleeding of puncture wounds should be encouraged; the site of exposure should be immediately washed well with soap and water but without scrubbing. Clothing contaminated by (BBF) should be removed [(11, 12)]. The awareness of these first aids measures were well understood by our participants in 80%-95% which is comparable to other study [(4. 6)]. Primary prevention by strict adherence to the standard infection control precautions, the use of safer devices and the implementation of work practice controls to prevent injuries that confer risks for HBV transmission to patients and their providers, is the mentioned strategy [(13)].

## 4.3. Reporting the Incident

Sharps injury reporting and notification to infection control office among our ORP though is low 64%, but in agreement with Zafar et, al. 53% [(6)], Hui-Ling et, al. 51.7%. [(14)]. In Moazzam et, al. the gap between knowledge and practice was indicated by 41% healthcare providers who had an exposure and did not report the incident although 90% of them were aware that it should be reported [(15)]. These findings are in agreement with the literature which showed that there is a pattern of low reporting [(16)]. The most common causes for under reporting in the literature include; the belief that the risk of infection was low, being too busy, not knowing the reporting procedure, and not wanting to appear careless [(14, 17)].

## 4.4. Which Blood to Screen in Case of NSI?

The most common attitude of our participants was to have the patient and healthcare provider both to undergo a blood test in 69.1%, which is slightly higher than the response in UAE study 52.2% to 55.7% [(15)]. In our study 23% answered the patient only should undergo a blood test; and this is somewhat higher than 14.3%-18.3% in the same former study [(15)].It is important that information about percutaneous exposure to HIV and appropriate prophylactic treatment is circulated to surgeons effectively, especially as the recommended prophylaxis needs to be given within one hour of exposure [(18, 19)]. Most of our participants 93.8% agreed to these principles, and to receive medications if the source blood turns positive. This high level of knowledge contrasts the response of 29% HCWs in a different study about PEP to be taken following an accidental NSI [(4)]. Antiretroviral treatment reduces the ability of the virus to

replicate, allowing the intact immune system an opportunity to clear the virus and thereby reduce the risk of seroconversion [18].

### 4.5. Post Exposure Prophylaxis

PEP is indicated when HCWs injured from seropositive sources. If the source was HBs Ag positive, HCWs should be given a hepatitis B immunization booster. If the HCW was antiHBs negative, both hepatitis B immunoglobulin (HBIG) and hepatitis B vaccine should be administered. For HCWs who sustained injuries from HIV positive sources, antiretroviral therapy should be started. Follow-up is important after three and six months of exposure [11]. PEP regimen for occupational exposure to HIV combines 2 nucleoside reverse-transcriptase inhibitors, with or without a protease inhibitor [20].

### 4.6. Vaccination Status of ORP

The CDC recommended that all HCWs and students should receive hepatitis B vaccine, 3-dose should be followed by assessment of hepatitis B surface antibody to determine vaccination immunogenicity and, if necessary, revaccination [13]. The vaccination status of the surgical personnel in in our hospital was found to be much lower than recommended; only 55%, the strange in our study is that only one third of the house-surgeons were vaccinated. This is even less than 88.1% vaccination rate in Iran which includes medical specialists [21], and 60-80% of the HCWs in United Arab Emirates [15]. But our rate of vaccination is higher than some African countries, in Nigerian in four university hospitals only 26.8% were actually vaccinated [22]. The reasons for non-vaccination were lack of time to attend, not enough information on the vaccination, and no idea about existence of immunization. Underestimation of the risks of HBV exposure and transmission may also relate to these failures [21, 22]. CDC guidelines stipulate that the employer make available the hepatitis B vaccination series to all employees [13].

### 4.7. HBV/HIV Prevention Program

Training and education have been found to be of paramount importance to developing awareness among HCWs, as well as improving adherence to good clinical practice [23].

It has been evident from our study that the provision and continuation of the educational programs by the ICD was very few and infrequent for the ORP as those how attend them were only 28%. The awareness towards HBV/HIV infection, use of universal precaution, needle stick injuries and post exposure prophylaxis still below optimum, as well as the importance of HBV immunization and reporting in our hospital. The same was happening in Malaysia, as being shown from Hamid study in a tertiary hospital [24]. Limitation of this study is, its conveniently selected small sample size, but the information revealed is alarming as the vaccination coverage of the ORP is very low.

## 5. Conclusion

This study showed that there is adequate knowledge and a fair level of awareness among medical doctors and paramedics towards universal precautions. Despite the seriousness of blood borne transmission of the three viruses, knowledge of PEP needs to be emphasized. Defined policy to prevent, report and manage occupational exposure to blood borne pathogens is needed. The reporting rate at a large teaching hospital for needle stick injuries incurred during operations is poor. The need to organize more regular educational and awareness activities is important to have an impact on the knowledge of ORP.

## Abbreviations

| | |
|---|---|
| BBF | Blood and body fluid |
| HCW | Health care worker |
| ICD | Infection control department |
| NSI | Needle stick injury |
| ORP | Operating room personnel |
| PEP | Post exposure prophylaxis |
| UP | Universal precaution |

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