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RESEARCH ARTICLE

PREVALENCE OF SHARP INJURY AMONG STAFF NURSES IN A TERTIARY HOSPITAL: A CROSS SECTIONAL STUDY

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Abstract

Background: Healthcare settings pose a major occupational hazard to their employees. Needlestick and sharps injuries (NSSIs) are one of the major risk factors for blood-borne infection among healthcare workers.

Materials and Method: A hospital-based cross-sectional study was carried out in a tertiary healthcare hospital in Lucknow district with the objectives of assessing the prevalence of sharp injury among staff nurses and the safety precautions taken after the occurrence of sharp injury. The study participants included the staff nurses at various departments of the hospital who were randomly selected for the study. Thus a total of 85 staff nurses were selected and interviewed after taking verbal consent.

Results and Discussion: The majority (54.1%) of the staff nurses were in the age group of 26-35 years. Out of the total, 32.9% had an incident of sharp injury. Needle (67.9%) accounted for the maximum injury. Of the total that got injured, injury occurred during the use of sharp item (82.1%) and of the total that got injured, only 28.6% took post-exposure prophylaxis as injection TT.

Conclusion: In the present study almost half of the participants had an occurrence of sharp injury over the past one year. And poor post exposure prophylaxis practices were observed.

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Introduction:-

Over the past few decades the increasing awareness on health has increased the demand for healthcare need significantly. Simultaneously the number of healthcare facilities has increased in order to cater to the demands and needs of the people. Healthcare settings pose a major occupational hazard to its employees. Because of the environment in which they work, healthcare workers are vulnerable for NSI and carry very high risk for transmission of occupational infections (OI), among which human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) are the major ones. Healthcare workers are at risk of "Occupational exposure" by percutaneous injury (eg. Needlestick or sharp instrument cut), contact of mucous membrane of eye or mouth, contact with non intact skin (e.g. abraded skin) or contact with intact skin when duration of contact prolonged (e.g. for several minutes) with blood or other infectious body fluid like semen, vaginal secretion, cerebro-spinal fluid, pleural fluid, pericardial fluid, synovial fluid etc [1].

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Needlestick and sharps injuries are one of the major risk factors for blood-borne infection among the healthcare workers. Among 39.5 million health-care workers (HCWs) worldwide, 3 million experience NSSIs every year [2]. Worldwide, an estimated 16 billion injections are administered every year but not all needles and syringes are disposed off safely which increases the risk of injury and infection and opportunities for reuse. According to WHO in 2010, unsafe injections were still responsible for as many as 33,800 new HIV infections, 1.7 million hepatitis B infections and 315,000 hepatitis C infections. A person who experiences one needle stick injury from a needle used on an infected source patient has risks of 30%, 1.8%, and 0.3% respectively of becoming infected with HBV, HCV and HIV [3].

Prevention of NSSIs is one of the major public health issues in India where safer sharps device or device with built-in sharp features or mechanism to effectively reduce the risk of the injuries are not widely available. The situation is worsened by gross underreporting of such injuries among the HCW. Surveys of healthcare personnel indicate that 50% or more do not report their occupational percutaneous injuries [4-10]. Exposure of healthcare personnel to sharp injury is critical as many health hazards are associated with it. A large proportion of occupational infections are preventable by simply following universal precautions and post exposure prophylaxis (PEP), but, only if healthcare personnel are aware of these measures, they will be able to protect themselves. The present study has been taken up to assess the occurrence of sharp injury and the safety precautions taken.

Objectives:-

- 1) To assess the prevalence of sharp injury among staff nurses
- 2) To assess the safety precautions taken after occurrence of sharp injury

Materials and Methods:-

The present study is a hospital based cross sectional study which was carried out in a tertiary healthcare hospital in Lucknow district. The duration of study was of 6 months duration i.e. from Feb - July 2016. The study participants included the staff nurses at various departments of the hospital who were randomly selected for the study. Thus a total of 85 staff nurses were selected and interviewed after taking verbal consent. A pretested semi-structured questionnaire was used to collect the data through personal interview. Information was collected on biosocial profile like age, gender, educational status, and work experience, occurrence of sharp injury, post exposure prophylaxis and safety measures taken. The data was scrutinized for adequacy and statistical analysis was performed using SPSS software version 16.

Results:-

The study was conducted at King George's Medical University, Lucknow. The institute is a 100-year old tertiary care 3500 bedded hospital with about 44 departments. A total of 85 staff nurses participated in the study. Majority (54.1%) of the staff nurses were in the age group of 26-35 years. Most of them were female (83.5%) and 44.7% of the staff nurses were educated till intermediate, 38.8% were graduates and 16.5% were post graduates. Of the total 41.2% had a work experience of 3 to 5 years, 34.1% had a work experience of less than two years and 24.7% had a work experience of more than six years (Table 1).

Out of the total, 32.9% had an incident of sharp injury and the site of injury was on the hand in all the cases. Needle (67.9%) accounted for the maximum injury followed by ampule/vial (21.4%) and IV cannula (10.7%). And in 42.9% of the case the sharp item causing the injury was contaminated. After the sharp injury, 39.4% applied only antiseptic and 21.4% washed the injury site with soap and water and applied antiseptic immediately after the injury. Out of the total that got injured, only 28.6% took post exposure prophylaxis as injection TT. Among the total staff nurses 70.6% and 85.9% had received prophylactic injection TT and hepatitis B vaccination respectively (Table 2).

Of the total those who got injured, injury occurred during the use of sharp item in 82.1% and among 10.8% after use but before disposal of the item. The maximum sharp injury occurred during administration of drug (67.9%) followed by injury during surgical procedures (10.8%) and taking blood sample (7.1%) and IV cannula insertion (Table 3)

Discussion:-

The present study describes the prevalence of needlestick and sharp injury among the nursing staff, the nature and circumstances of exposure to sharp injury and the post exposure prophylaxis taken after the injury. Needlestick and other sharp injuries carry significant risk of transmission of blood borne pathogens to healthcare workers. In the

present study the prevalence of sharp injury among the staff nurses was 32.9%. Similar findings were found in a study by **Hashmi A et al.** (20) where a total of 32 cases of sharps injuries occurred during the six-month period and nurses accounted for 15 (46.9%), constituting the largest group of the HCWs and which might probably be due to work load. **Zafar A et al.**(26) showed that junior doctors sustained highest number of injuries 394 (28.5%) followed by registered nurses 283(20.4%). Present study shows that among those who had sharp injury, the device causing the injury was contaminated in almost half of the case (42.9%) and the device causing maximum injury was needle (67.9%). Others studies have shown similar findings, **Hanafi M.I. et al.** (22) wherein disposable syringes accounted for the highest proportion of injuries (38.4%). **Guo Y.L. et al.** (27) showed that syringe needles were by far the most important items causing injuries, constituting 52% of cases.

After the injury only 21.4% washed the site of injury with soap and water and applied antiseptic and only 28.6% took post exposure prophylaxis. The findings in the study shows the lack of awareness among the staff nurses about the importance of post exposure prophylaxis and the health hazards associated with sharp injury. Periodic training on safe injection practices, universal precaution, pre-exposure prophylaxis and post-exposure prophylaxis of sharp injury, education on the health hazards related with sharp injury should be established. **Sharma S et al.**(18) found in their study that none of the health workers who had experienced a needlestick injury in the past 12 months took any action following the injury. In a study by **Siddique K et al.** (28) observed that another important issue of the study was awareness regarding post exposure prophylaxis which was found to be only 10%.

This study showed that majority of the sharp injury occurred during use of item (82.1%) and during administration of drug (67.9%). **Radha R et al.**(19) in their study showed that majority of the NSI (46 %) occurred during use of item on the patient. **Wicker S et al.**(25) which revealed that about 219(39%) of reported needle stick injuries were sustained during a procedure. **Anupriya A et al.** (16) in their study found that of the participants, 26.6% had experienced a NSSI during injecting medicine or drawing blood. Vaccination is one of the best ways to protect healthcare workers from infection, vaccination against tetanus and hepatitis B should be ensured. In the present study 70.6% and 85.9% had received injection TT and hepatitis B vaccination respectively.

Table 1:- Biosocial Characteristics of study participants.

| Bio-Social Characteristics | | N | % |
|----------------------------|--------------|----|------|
| Age (years) | ≤ 25 | 17 | 20.0 |
| | 26-35 | 46 | 54.1 |
| | 36-45 | 6 | 7.1 |
| | ≥ 46 | 16 | 18.8 |
| Gender | Male | 14 | 16.5 |
| | Female | 71 | 83.5 |
| Educational Status | Postgraduate | 14 | 16.5 |
| | Graduate | 33 | 38.8 |
| | Intermediate | 38 | 44.7 |
| Work experience (years) | <2 | 29 | 34.1 |
| | 3 - 5 | 35 | 41.2 |
| | > 6 | 21 | 24.7 |

Table 2:- Sharp injury and Practices regarding personal safety measures.

| Characteristics | | Response | |
|----------------------------|-------------|----------|------|
| | | N | % |
| Occurrence of Sharp Injury | Yes | 28 | 32.9 |
| | No | 57 | 67.1 |
| Site of injury | Hand | 28 | 100 |
| | Others | - | - |
| Type of device | IV cannula | 3 | 10.7 |
| | Needle | 19 | 67.9 |
| | Ampule/Vial | 6 | 21.4 |
| | Blade | - | - |
| | Wire | - | - |

| | | | |
|--|--|----|------|
| Sharp item contaminated | Yes | 12 | 42.9 |
| | No | 16 | 57.1 |
| Immediate action taken after injury | Washed with soap, water and antiseptic | 6 | 21.4 |
| | Washed with soap and water | 2 | 7.1 |
| | Washed with water and antiseptic | 4 | 14.3 |
| | Only antiseptic | 11 | 39.4 |
| | Only water | 3 | 10.7 |
| | Did nothing | 2 | 7.1 |
| Taken PEP | Yes | 8 | 28.6 |
| | No | 20 | 71.4 |
| Type of PEP taken | Only Injection TT | 8 | 9.4 |
| | Only Hepatitis B Ig | - | - |
| | Both Inj. TT and Hepatitis B Ig | - | - |
| | Only Injection TT | - | - |
| Immunisation status | Injection TT | 60 | 70.6 |
| | Hepatitis B | 73 | 85.9 |

Table 3:- Distribution of Staff Nurses based on Events during which Sharp Injury occurred.

| Characteristics | | Response | |
|---|----------------------------|-----------------|----------|
| | | N | % |
| Activity when injury occurred | During use of item | 23 | 82.1 |
| | After use, before disposal | 3 | 10.8 |
| | During disposal | - | - |
| | Others, describe | 2 | 7.1 |
| Procedure during which injury occurred | Administration of drug | 19 | 67.9 |
| | Taking blood sample | 2 | 7.1 |
| | IV cannula insertion | 2 | 7.1 |
| | During surgical procedures | 3 | 10.8 |
| | Others, describe | 2 | 7.1 |

Conclusion:-

Healthcare workers are at constant risk of exposure to injury with sharp items and thereby transmission of infections likes HBV, HCV and HIV. In the present study almost half of the participants had an occurrence of sharp injury over the past one year and poor post exposure prophylaxis practices were observed. Therefore, the hospital administrators should give training and retraining on safe injection practices, universal precautions and education on occupational hazards, pre and post exposure prophylaxis. All the health workers should have pre-employment immunization against tetanus and hepatitis B.

Declarations:

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Conflict of interest:

None declared.

Ethical approval:

The study was approved by the Institutional Ethics Committee.

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