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Knowledge of Occupational Exposure to Hiv Amongst Emergency Healthcare Providers And Cleaning Staff in A Teaching Hospital

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I. Introduction

HIV, HBV and HCV, among others are important infections which can be transmitted to Health care workers (HCWs) while performing occupational activities. The first case of occupational transmission of HIV from infected patients to HCW was reported in 1984 and as on 2010 altogether 57 cases have been reported in USA. Transmission of HIV by occupational activity is possible not only from patients to HCW but also from the infected HCW to patients. There are a small number of documented cases of transmission from HCW to patients. Therefore occupational transmission is a two way process. HIV infection can be transmitted by needle stick injury, body fluid exposer, trauma sustained during the occupational manipulation/handling. HCW prone to exposure are Nurses, doctors, emergency medical staff, laboratory technicians, mortuary staff and cleaners. The resident doctors, emergency laboratory staff and cleaners are especially vulnerable. There is paucity of reports regarding the vulnerability, knowledge level of cleaners about the issues of post exposure prophylaxis (PEP). It is very important to prevent a disease such as HIV which has immense impact on the life of the infected. Interestingly, occupational transmission is preventable if the basic universal work precautionary measures and appropriate timely PEP is religiously followed. PEP is a comprehensive approach which includes first aid, counseling, risk assessment, laboratory investigations with informed consent of both the exposed and the source followed by 28 days of anti-retroviral therapy (ART) and periodic follow-up. In this regard the NACO (National AIDS Control Organization) has initiated PEP program in its pursuit to prevent the infection amongst the medical personals and provides free ART. Manipur being highest prevalence state as per the NACO report 2016, the study has a special importance as the HCWs in this zone have high risk of being exposed to occupational transmission of HIV. Knowledge about the infection, routes of infection, occupational risk; provision for preventive gadgets at the work place is of utmost necessity especially amongst the vulnerable group. Various studies have suggested insufficient knowledge as a factor influencing occupational exposure to needle stick and sharp injuries. The study attempts to ascertain the knowledge about different aspects of occupational exposure to HIV amongst the most vulnerable health care providers and also the knowledge about the NACO initiatives about PEP. The outcome of the study will provide insights and suggest actions required to be undertaken by the person concerned in particular and the institution at large to further strengthen the PEP strategy with an essence to prevent what is actually preventable.

Aims and Objectives

1. To study the knowledge of occupational exposure to HIV among the emergency health care providers and cleaners of the hospital.
2. To study the awareness of the emergency health care providers and cleaners of the hospital about the facility in place in the hospital under the National AIDS Control Organization (NACO) Post Exposure Prophylaxis (PEP) program.

II. Material and Methods

An Institutional based cross sectional observational study undertaken in Regional Institute of Medical Sciences(RIMS), Imphal, a teaching Institute in Manipur, North eastern part of India .The Institute apart from running an anti-retroviral therapy (ART) Centre is also a designated Centre of excellence (CoE)on HIV care of NACO,GOI. There are ten such designated centers in the country.

A total of 100 (one hundred) subjects were enrolled , by inducting resident doctors of (including Pre-clinical, Para-clinical, clinical) laboratory technicians, Nursing staff, Attendants (general & laboratory) and cleaners of the hospital who were posted/attached in the emergency service , Laboratory and central blood collection centers and willing to be enrolled in the study. Purposive sampling was used to select study participants. They were subjected to self-administered pre-designed questionnaire. 2 postgraduate students and

the coordinator of the cleaning staff were used after proper training to collect data under the supervision of the principal investigators. The questionnaire which was framed by the research team composed of 20 different variables related to the objectives of the study and based on the NACO guidelines. The variables reflected the basic information on HIV infection, its routes of transmission and the awareness about the concept and modality of delivery of PEP. It was pretested on 5% similar populations which were not included in the study before the actual data collection period. The assessment was conducted at their respective workplaces after explaining about the study and obtaining consent. Anonymity was ensured to maintain confidentiality. Interpreter was provided for the study subjects having language difficulty.

Questionnaire:

1. Age (years): <20, 20-30, 31-40, 41-50, 51-60, >61
2. Gender: Male: Female
3. Work profile: emergency doctors (Pre-clinical, Para-clinical, clinical), Laboratory technician, Nursing staff, hospital cleaners, general attendants and laboratory attendants
4. Attended educative session on HIV/Post exposure prophylaxis (PEP): Yes/No
5. Ever exposed to a HIV risk at work place: yes/No/Not known
If yes-Needle stick/body fluid/trauma
- reported to the authority (yes/No)
- availed PEP drugs (yes/No)
6. Cause of HIV: HIV1/HIV2/Both/None/Don't know
7. Routes of HIV transmission: IVDU/Sexual/blood transfusion/occupational exposure /All above/don't know
8. Risk of occupational exposure to HIV exist for health care providers: True/False/don't know
9. Probability of getting HIV infection by needle stick injury: 3%, 0.3%, 1%, 2%, don't know
10. Risk of getting HIV by mucus membrane exposure: 0.09%, 1%, 2%, 3%, none of the above, don't know
11. PEP effectiveness (approximately) : 90-100%, 80-90%, 70-80%, 60-70%, 0%, don't know
12. Best time to start PEP drug after injury:
Wait for 2hrs/within 6hrs/ at 12hrs/as late as 24hrs/as early as possible within 2hrs/don't know
13. Eligibility of PEP: determined by exposure and source code/ any injury /none of the above/don't know
14. Duration of PEP: 30days /28days /21days /none/don't know
15. Name of basic PEP drugs: Tenofovir+ Lamivudine+ Efavirenz / ATV+ Lamivudine+ Efavirenz / Lopinavir+ lamivudine+ nevirapin / none of the above/don't know
16. How to react when injured
(Wash with tap water-no sucking-no detergents-determine eligibility-start PEP drug as soon as possible): Yes/No/don't know
17. Where drugs are available: Casualty Dpt, ICU, Labour room, OT, All the above, don't know
18. PEP drugs supplied free of cost for health care providers by National AIDS control organization(NACO): Yes/No/don't know
19. Side effects of the basic PEP drugs: Renal failure, Sleep disturbance, all of the above, don't know
20. Follow up schedule (periodic clinical and Laboratory) required after PEP initiation: Yes/No/don't know

Item no.1 to 5 in the questioners are for recording the basic profile of the subject whereas item no.6 to 20 are to test the basic information /knowledge of the subjects about PEP against HIV .Each correct response will score 1 point.The total score of each subject will be calculated.

The following operational definitions were used:

Extra-ordinary knowledge- scoring >90% of correct response to the questions
Excellent knowledge- scoring 80-89% of correct response to the questions
Very good knowledge- scoring 70-79% of correct response to the questions
Good knowledge- scoring 60-69% of correct response to the questions
Fair knowledge- scoring 50-59% of correct response to the questions
Poor knowledge- scoring <50% of correct response to the questions
Exposure to HIV risk conditions: health care providers/cleaners exposure to HIV risk conditions at workplace such as blood, needle prick/sharps injury and body fluids of patient.
Responses were recorded in excel sheet and statistically analyzed using SPPS. Appropriate descriptive statistics was calculated .

III. Result

Out of 100 participants 7 subjects did not complete the questionnaire.93 subjects completed the questionnaire. Male to female ratio being 36:57.The age wise distribution of subjects showed 3 (below 20 years), 30(21 to 30 years), 29 (31 to 40years), 22 (41to 50years),and 9 (51 to 60 years) respectively. The work nature of the

subjects were Lab. technicians (9), Doctor (21), Nurses (22), Laboratory attendant (13), general attendant (10) and hospital cleaners (18).

Picture 1: Depicting the gender distribution of the subjects

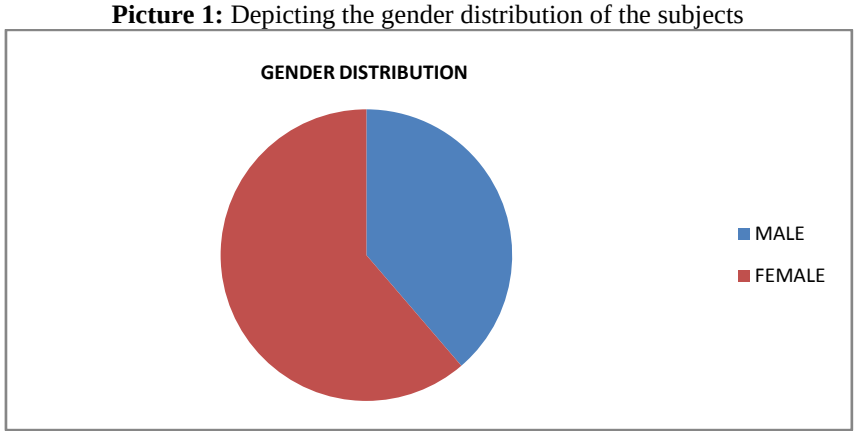


Table 1: Age wise distribution of the study subjects

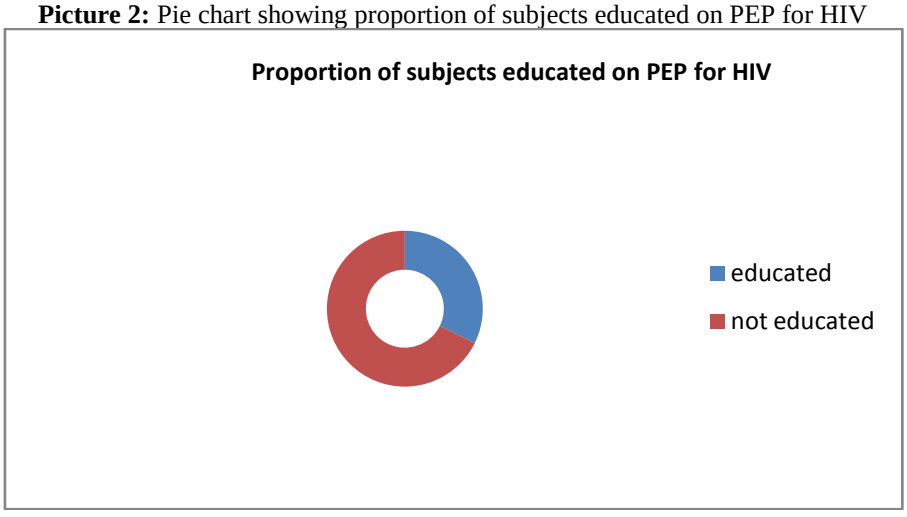
Age in years	Number of subjects
<20	03
21-30	30
31-40	29
41-50	22
51-60	09

Table 2: Work profile distribution of subjects:

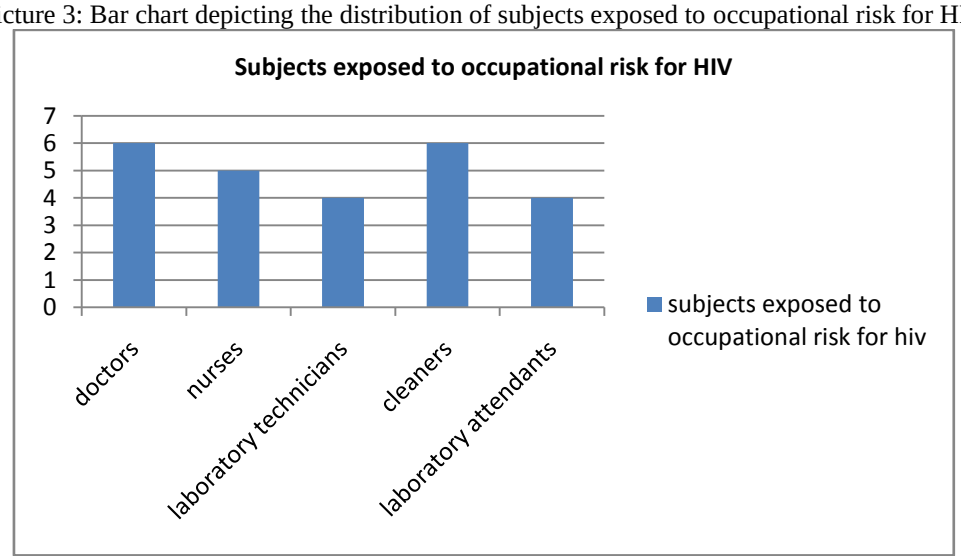
Work profile	Number of subjects
Doctors	21
Nurses	22
Laboratory technicians	09
Laboratory attendants	13
General duty attendants	10
Cleaners	18

Altogether 30 (32.25%) attended educative session on PEP of HIV and 63 of the subjects did not attend any such session amounting to (67.74%) of the study population. 25 (26.88%) of subjects gave history of occupational exposure to HIV (Nurse 5, Technician 4,Doctor 6,Hospital cleaner 6,Lab.attendent 4).Only 11 (44%) of the exposed subjects reported the incident to the authority. Only 6 of the exposed took (24%) the PEP ART out of which 1 did not complete the regimen.

Picture 2: Pie chart showing proportion of subjects educated on PEP for HIV

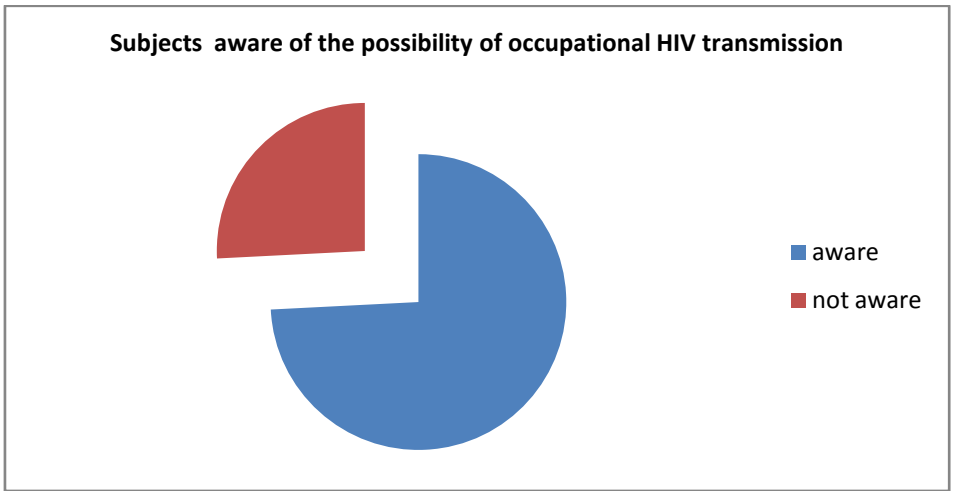


Picture 3: Bar chart depicting the distribution of subjects exposed to occupational risk for HIV

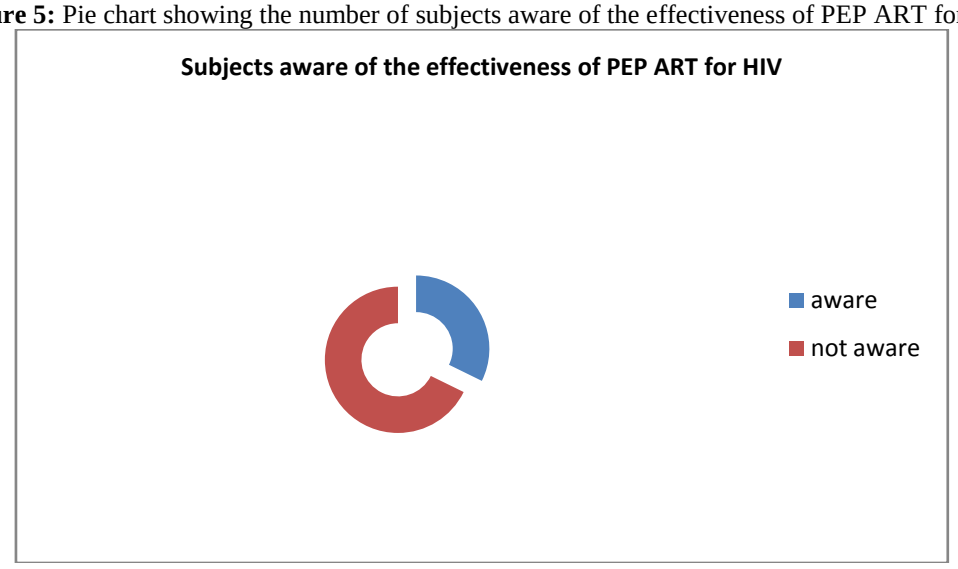


24 of the subjects (25.80%) were not aware of the possibility of occupational risk exposure (doctor Nurse 2,cleaner 18,Attendent 4).All the hospital cleaners in the study were not aware of the risk.

Picture 4: Showing the subjects aware of the possibility of occupational HIV transmission

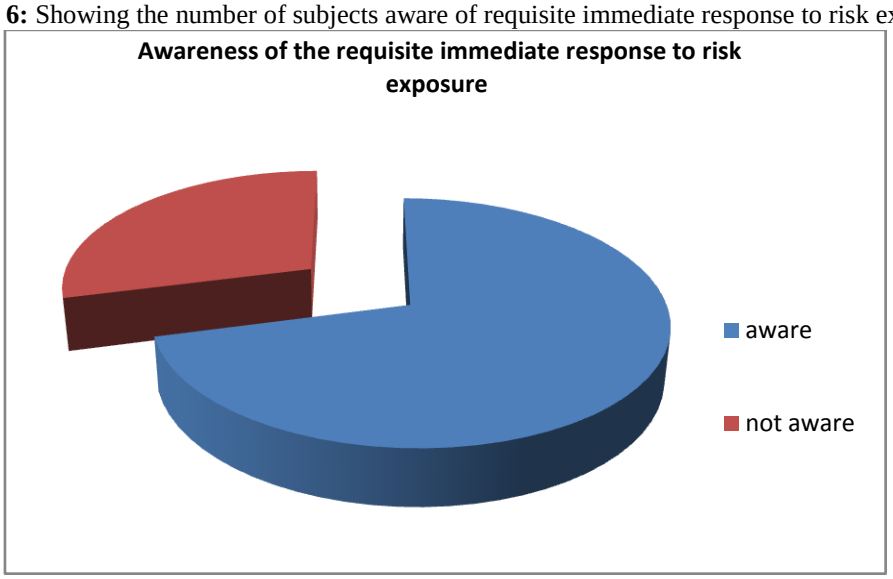


Picture 5: Pie chart showing the number of subjects aware of the effectiveness of PEP ART for HIV

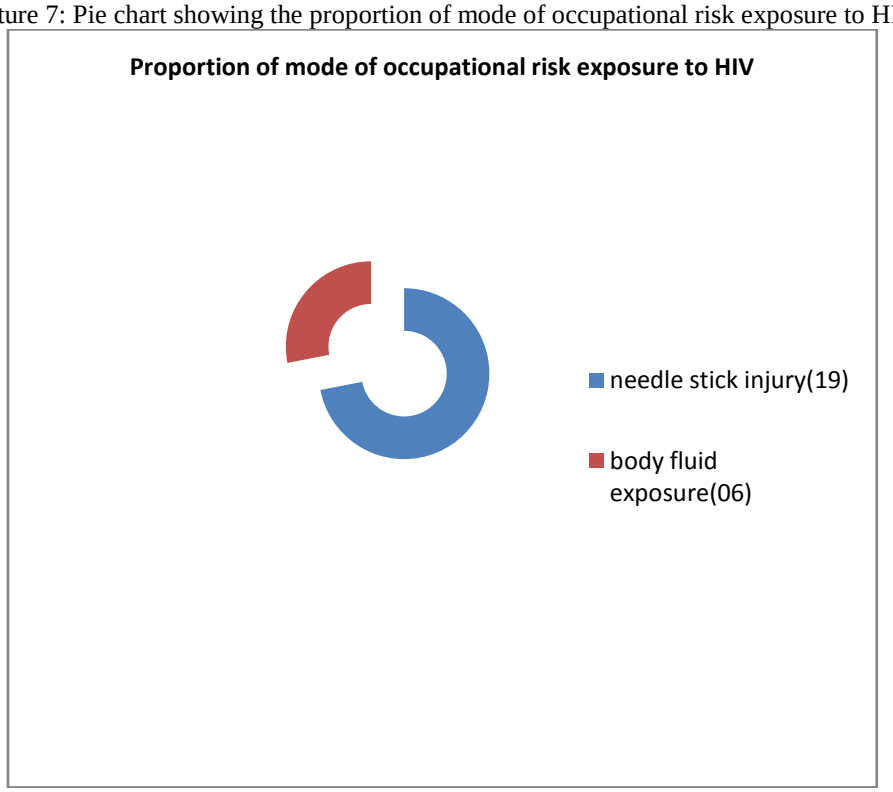


30 subjects (32.25%) were aware of the effectiveness of PEP ART medication and 63(67.74%) did not know.51 subjects (54.83%) were aware of the best time to start PEP ART. 41 subjects (44.08%)knew of the eligibility criteria to start PEP ART.21 subjects (22.58%) had the knowledge about the basic regimen of PEP ART.13 subjects were aware of the total duration of the PEP ART.66 subjects(68.75%)were aware of the immediate response to be undertaken in the event of exposure.37 (39.78%) had the knowledge about adverse effects of PEP ART. The requirement of periodic follow up after the initiation of PEP ART is understood by 55 subjects(59.13%).

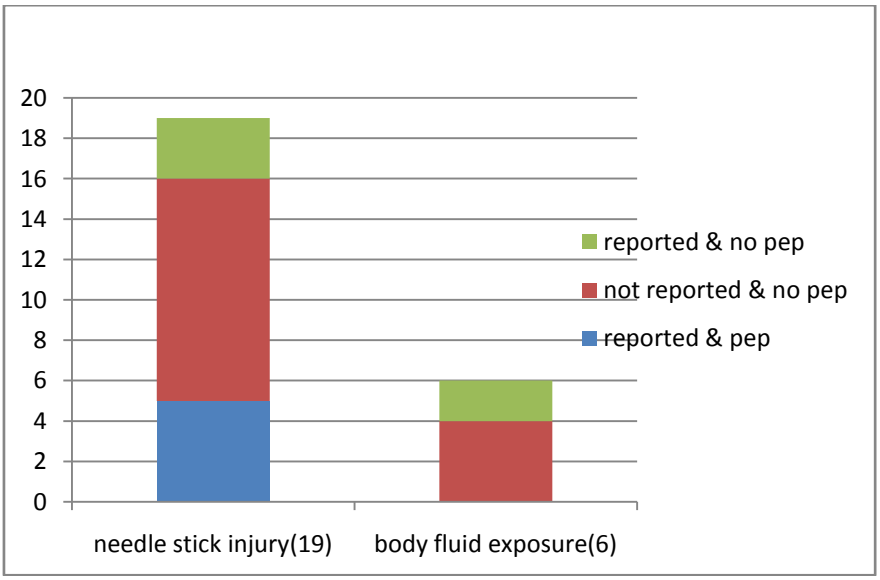
Picture 6: Showing the number of subjects aware of requisite immediate response to risk exposure



Picture 7: Pie chart showing the proportion of mode of occupational risk exposure to HIV



Picture 8: Showing the mode of exposure and action taken by subjects having experienced occupational risk exposure



The score obtained by each subject is tabulated percentage wised. 42 subjects scored <50%,7 scored 50 to 59%,25 scored 60 to 69%,8 scored 70 to 79%,5 scored 80 to 89%,5 scored 90 to 99% and 0nly 1 scored 100%.

Table 3: Showing the number of subjects with corresponding score category

Total score (%)	Number of subjects
<50	42
50-59	07
60-69	25
70-79	08
80-89	05
90-99	05
100	01

IV. Discussion

The risk for occupational infection with HIV is well established amongst the healthcare providers. WHO estimates that about 2.5% of HIV cases among health care workers worldwide are due to result of such exposure according to Gandha Kapil M etal. Different classes of health care providers like doctors, nurses, laboratory technicians or other support staffs are at risk depending upon their work profile. NACO has initiated free PEP program for the health care workers against occupational exposure to HIV. The program also includes periodic training programs ,supplemented by refresher training sessions for the targeted population which may be undertaken by either the NACO directly or the concerned parent institute or hospital . The main determining factor for successful outcome of the initiative is proper education, awareness about the basic information on HIV, relevant fundamental facts about PEP and most importantly knowing the procedure in place to access the facility in the shortest possible time and followed by the required formalities. HIV as of now is incurable; therefore best option is to prevent oneself from getting the infection. Understanding the knowledge status of health care providers will help unearth the deficiencies in the system and address effectively with the ultimate effort to prevent occupational transmission of HIV.

There are some studies undertaken to estimate the knowledge of health care providers across the globe. However the state of Manipur which has recorded highest HIV prevalence in this country has not undertaken any study on the present topic. The place of study is the first Medical College of the state where the NACO designated CoE on ART care is located. Complicated HIV patients and especially those who are on second-line ART are treated and admitted in this institute by virtue of being a referral center under the NACO CoE scheme. Recently 3rd line ART has also been rolled out from this center. Emergency health care providers of this center are therefore at high risk for getting exposed to HIV while performing their occupational tasks.

Out of 100 participants 93 subjects completed the questionnaire as 7 subjects did not complete the questionnaire. Male to female ratio being 36:57, thus large numbers of female employees are stationed in the emergency medical service setting. Majority 81 (87.09%) were between 21 to 50 years which is the most productive age group. The work profile of the subjects indicates that large number of doctors, nurses and hospital cleaners were exposed to the risk.

Only 30 (32.25%) study subjects ever attended educative session on PEP of HIV and 63 of the subjects did not attend any such session(67.74%) thus indicating the requirement of more training sessions on PEP of HIV.As per the study by Sivprakash G etal almost all study subjects were found to be haven inadequate knowledge about the attendance to educative programs on PEP in recent past.25 (26.88%) of subjects gave history of occupational exposure to HIV(Nurse 5,Technician 4,Doctor 6,Hospital cleaner 6,Lab.attendent 4).Only 11 (44%) of the exposed subjects reported the incident to the authority thus the need for creating awareness about the reporting system to ensure proper data collection and undertaking appropriate follow up action . Only 6 of the exposed subjects took (24%) the PEP ART out of which 1 did not complete the regimen thus the access to PEP ART needs enhancement.

24 of the subjects (25.80%) were not aware of the very existence of the possibility of occupational risk exposure to HIV (Nurse 2,cleaner 18, Attendant 4).Alarmingly all the hospital cleaners in the study were not aware of the risk. There is an urgent need to educate this group of employees.

Though 30 subjects (32.25%) were aware of the effectiveness of PEP ART medication a big number of the study subjects 63(67.74%) did not know the benefit of PEP therefore the need to educate personals with a view highlight the effectiveness of PEP so that more number of personals are protected.

51 subjects (54.83%) were aware of the best time to start PEP ART but only 41 subjects (44.08%) knew of the eligibility criteria to start PEP ART. 21 subjects (22.58%) had the knowledge about the basic regimen of PEP ART.13 subjects were aware of the total duration of the PEP ART. It is encouraging that 66 subjects (68.75%)were aware of the appropriate immediate response about the site of injury to be undertaken in the event of exposure but the remaining 27 subjects need awareness about the response.37 (39.78%) had the knowledge about adverse effects of PEP ART. The requirement of periodic follow up after the initiation of PEP ART is understood by 55 subjects (59.13%).

Altogether 25 study subjects (26.88%) gave history of occupational risk exposure to HIV. Needle stick injury is the main mode of exposure which was reported in 19 subjects and followed by body fluid exposure in 6 subjects. Only 5 exposed subjects (20%) actually reported and completed the requisite PEP therapy and 15 exposed subjects (60%) did neither reported nor took the PEP therapy. This is indicative of the urgent need for creating more awareness amongst the health care providers to report and access the provision of PEP therapy. Needle prick injury as major mode of exposure is also reported by Jharna Lamichanne etal.

The score obtained by each subject from the response to the study questionnaire is tabulated percentage wise. 42 subjects scored <50%, 7 scored 50 to 59%,25 scored 60 to 69%, 8 scored 70 to 79%, 5 scored 80 to 89%,5 scored 90 to 99% and 0nly 1 scored 100%.This indicates that more than 50% of the emergency health care providers and employees in the study are not adequately sensitized about the basic issues pertaining to the occupational exposure to HIV. This finding is in agreement with the study undertaken by Rotimi S etal. which found that the knowledge of health care providers are poor . Gurdeep singh etal. also reported inadequate knowledge about PEP amongst the HCWs.

The finding of the study suggests an urgent need for scaling up the educative session on PEP for HIV for all categories of employees posted in the emergency health care delivery setting. There is a need for a special focus for the lower rung employees like hospital cleaners to prevent from the menace of HIV infection, a disease which is not treatable as of now. Prevention holds the key to fight HIV infection and in this effort awareness amongst the health care provider about the HIV PEP is paramount. The knowledge regarding prophylaxis against occupational transmission of HIV should not only be ensured but also be maximized to achieve optimum outcome.

V. Declaration

This is to declare that, the article entitled **"Knowledge of occupational exposure to HIV amongst emergency healthcare providers and cleaning staff in a teaching hospital"** being submitted for consideration of publication is an original work undertaken by the authors. It is also declared that the article is neither been published nor being submitted for consideration for publication to any other journal. We agree with the sequence of the authorship and that, there is no conflict of interest in any manner regarding the authorship of the paper. We do submit full copyright of the paper to your esteemed journal.

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