Research Article

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Needle stick injuries and awareness towards post exposure prophylaxis for HIV among private general practitioners of Davangere city

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ABSTRACT

Background: Health care workers are at increased risk of infection with blood borne pathogens. Most exposures among health care workers are caused by percutaneous injuries with sharp objects contaminated with blood or body fluids. HIV post-exposure prophylaxis (PEP) is effective in preventing potential HIV infection following accidental exposure. The objective of the study was to determine the prevalence of needle stick injuries (NSI) and factors affecting NSI among private general practitioners, awareness towards post exposure prophylaxis for HIV among private general practitioners.

Methods: The Cross-sectional, questionnaire-based study was conducted among private general practitioners of Davangere city.

Results: The prevalence of needle stick injures (NSI) in the life time of private general practitioners was 92.4%. In our study all participants had heard of HIV post exposure prophylaxis (PEP). Out of 150, 12 (8 %) had accidental exposure and 8 (67%) received HIV-PEP after exposure. Out of 8, 3(38%) completed the full HIV-PEP course.

Conclusions: Majority of the respondents had needle stick injuries at least once in their life time. Majority of respondents had NSI while recapping needle. Majority of the participants had good level of awareness on PEP. Despite of good level of awareness they fail to practice HIV PEP.

Keywords: Needle stick injury, Post exposure prophylaxis, Private general practitioners

INTRODUCTION

Health care workers are at increased risk of infection with blood borne pathogens like hepatitis B and C viruses (HBV, HCV) and the human immunodeficiency virus (HIV) because of their occupational exposure to blood and other body fluids. Most exposures among health care workers are caused by percutaneous injuries with sharp objects contaminated with blood or body fluids. These sharps include needles, scalpels, lancets and broken glass¹.

According to World Health Report 2002, out of 35 million health-care workers, 2 million experience percutaneous exposure to infectious diseases each year. It

further notes that 37.6% of Hepatitis B, 39% of Hepatitis C and 4.4% of HIV/AIDS in Health Care Workers around the world are due to needle stick injuries.²

Needle stick Injuries (NSIs) are defined as an accidental skin penetrating stab wound caused by hollow-bore needles such as hypodermic needles, blood-collection needles, IV catheter stylets, and needles used to connect parts of IV delivery system.³

According to WHO Bulletin 2003, 30% to 50% of all needle injuries occur during clinical procedures⁴. The incidence of NSI is considerably higher than current estimates, due to gross under-reporting. The Centres for Disease Control (CDC), 2007 estimates that about

6,00,000 to 10,00,000 needle stick injuries occur each year. Unfortunately, about half of these needle stick injuries go unreported. In USA 6,00,000 to 10,00,000 receive NSI from conventional needles and sharps every year, while in UK it is 1,00,000 HCWs/year. In India, authentic data on NSI are scarce.^{5,6}

Occupational percutaneous exposures to blood borne pathogens can be prevented by strategies like immunization against HBV, scrupulous and consistent application of universal precautions and post exposure prophylaxis (PEP) to prevent the development of disease. But in many countries, it has not been possible to implement these strategies because of lack of data on disease burden associated with occupational exposure to blood borne pathogens.¹

Post exposure prophylaxis (PEP) refers to comprehensive medical management to minimise the risk of infection among Health Care Personnel (HCP) following potential exposure to blood-borne pathogens (HIV, HBV, and HCV). This includes counselling, risk assessment, relevant laboratory investigations based on informed consent of the source and exposed person, first aid and depending on the risk assessment, the provision of short term (four weeks) of antiretroviral drugs, with follow up and support. Centre for Disease Control (CDC) and National **AIDS** Control Organization (NACO) recommend PEP for workers with needle stick injuries. PEP for HIV exposure is best when started within golden period of <2 hours and there is little benefit after 72 hours. If started soon after exposure, PEP can reduce the risk of HIV infection by over 80%. The prophylaxis needs to be continued for 28 days. PEP is available as either basic regimen (2 Nucleoside Reverse Transcriptase Inhibitor (NRTI)) or expanded regimen (2NRTI and 1 PI drugs). NACO recommend Zidovudine/Stavudine + Lamivudine (basic regimen) and Zidovudine Lamivudine + Lopinavir/ Ritonavir (expanded regimen), and its available free of cost at all Anti-Retroviral Therapy Centres (ARTCs) and Integrated Counselling & Testing Centres (ICTCs).^{7,8}

Adherence to a full 28-day course of ARVs is critical to the effectiveness of the intervention. Recent evidence shows PEP uptake has been insufficient: only 57% of the people who initiated PEP have completed the full course⁹. Various studies done in past were institutional based focussing more on interns, nursing students with very little data available among general private practitioners. With this background the present study has been undertaken. ¹⁰⁻¹⁵

The objective of the study was to determine the prevalence of needle stick injuries (NSI) and factors affecting NSI among private general practitioners, awareness towards post exposure prophylaxis for HIV among private general practitioners, practice of post exposure prophylaxis for HIV among private general practitioners.

METHODS

This cross sectional study was conducted for 3 months from 1st January to 31st March 2015 among 150 private allopathic general practitioners of davangere city. After taking consent private practitioners were interviewed using pre-designed, pre-tested, semi-structured questionnaire was used. Statistical analysis was done by using proportion

Inclusion criteria

- 1. All qualified, registered allopathic private general Practitioners of Davangere city.
- 2. Private general practitioners who had work experience at least one year.

Exclusion criteria

- 1. All practitioners who were not cooperative and did not consent for the study.
- 2. All consultants of nursing home and teaching hospitals.

RESULTS

Table 1: The prevalence of needle stick injuries and factors affecting needle stick injuries among private general practitioners.

| Variable | Number | % |
|---------------------------------------|--------|------|
| Have you had needle stick injury in | 86 | 15.7 |
| the past 1 year | 00 | 13.7 |
| Frequency of needle stick injuries | | |
| experienced last one year | | |
| Once | 40 | 47 |
| 2-5 times | 36 | 42 |
| >5 times | 10 | 12 |
| When u had needle stick injury | | |
| (Procedure)? | 42 | 49 |
| Recapping a needle | 17 | 20 |
| During injection, puncture | 9 | 10 |
| During intravenous line insertion | 11 | 13 |
| During blood collection | 8 | 9 |
| During the intervention by instrument | 19 | 22 |
| Surgical blade injury | 6 | 7 |
| By disposing to the sharps container | | |
| Factors influenced for needle stick | | |
| injury | 40 | 47 |
| Heavy workload | 26 | 30 |
| Lack of protection measures | 41 | 48 |
| inattention, hasty work | 14 | 16 |
| Tiredness | 11 | 10 |
| After needle stick injury did you get | | |
| tested for | 32 | 37 |
| HIV | 33 | 38 |
| HBV | 1 | 1 |
| HCV others(specify) | 0 | 0 |

Table 2: Awareness about HIV post exposure prophylaxis among study participants.

| Variable | Number | Percentage | |
|---|--------|------------|--|
| Heard of HIV- PEP | | | |
| yes | 150 | 100% | |
| no | 0 | 0% | |
| HIV PEP is effective in preventing HIV transmission | | | |
| Yes | 125 | 83 | |
| No | 25 | 17 | |
| The proportion of needle stick injuries result in HIV | | | |
| transmission | | | |
| 1/100 | 27 | 18 | |
| 1/500 | 25 | 17 | |
| 3/1000 | 82 | 55 | |
| 10/1000 | 16 | 10 | |
| The fluids that can transmit HI | [V | | |
| Breast milk | 139 | 93 | |
| Urine/ faeces | 28 | 19 | |
| peritoneal fluid | 103 | 69 | |
| synovial fluid | 88 | 59 | |
| pleural fluid | 96 | 64 | |
| Saliva cerebrospinal fluid | 73 | 49 | |
| Cerebro spinal fluid | 110 | 73 | |
| Initial first aid measure to | | | |
| institute following needle | 17 | 11 | |
| stick injury? | | | |
| Promote active bleeding of | 121 | 81 | |
| wound | | | |
| Wash thoroughly with soap | 13 | 9 | |
| and water don't know | | | |
| The following are high risk | | | |
| exposures for HIV | 58 | 39 | |
| transmission | 0 | _ | |
| Percutaneous injuries | 8 | 5 | |
| Exposure of intact skin to | 72 | 49 | |
| body fluids Mucus membrane expessive | 73 | 49 | |
| Mucus membrane exposure Exposure of broken skin | 125 | 83 | |
| How soon after needle stick | 123 | 65 | |
| injury should PEP be | 78 | 52 | |
| commenced | 76 | 32 | |
| As soon as possible/ within | 66 | 44 | |
| 72 hours | 00 | | |
| After 72 hours don't know | 6 | 4 | |
| The ideal HIV-PEP regimen for | | | |
| stick injury | | | |
| One drug regimen | 14 | 9 | |
| 2- drug regimen | 90 | 60 | |
| Expanded drug regimen | 46 | 31 | |
| What is the duration of HIV –PEP | | | |
| 1 week | 12 | 8 | |
| 2 weeks | 13 | 9 | |
| 4 weeks | 106 | 71 | |
| 3 weeks | 19 | 12 | |
| Should HIV-PEP be administered for accidental non- | | | |
| occupational exposure to HIV | | | |
| Yes | 136 | 91 | |
| No | 14 | 9 | |
| | | | |

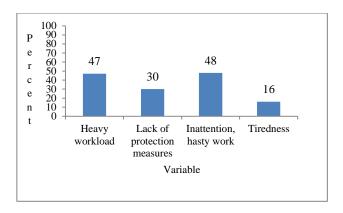


Figure 1: Factors affecting NSI among private general practitioners.

In the present study 84 (56%) were males and 66 (44%) females. The prevalence of needle stick injures (NSI) in the life time was 92.4% and in the past one year was 15.7%. 40 (47%) had needle stick injury only once and 36 (42%) had 2-5 times in the last one year. 42 (49%) had needle stick injuries while recapping needle, 17 (20%) during injection, puncture and 11 (13%) while collecting the blood sample. After NSI 33 (38%) and 32 (37%) had tested for HBV and HIV respectively and remaining 84 haven't undergone for any tests. (See table 1). Most common cause for NSI was heavy work load 37.9% followed by inattention and hasty work (Figure 1).

Awareness towards post exposure prophylaxis for HIV among private general practitioners

In our study all 150 private practitioners had heard of HIV post exposure prophylaxis (PEP). Out of 150 who had heard of HIV-PEP, 125 (83%) told that it is effective in preventing HIV transmission. 82 (55%) answered correctly the proportion of needle stick injuries result in HIV transmission.139 (93%) told breast milk, 103 (69%) told peritoneal fluid and 28 (19%) told urine/ faeces can transmit HIV. 121 (81%) answered correctly the first aid to institute following needle stick injury.125 (83%) answered exposure of broken skin is the high risk exposure for HIV transmission.78 (52%) told PEP should be commenced as soon as possible/ within 72 hours. 90 (60%) answered two drug regimen and only 46 (31%) answered correctly the ideal HIV-PEP regimen following high risk needle stick injury. 106 (71%) answered correctly the duration of HIV-PEP. 136 (91%) told HIV-PEP should be administered for accidental nonoccupational exposure to HIV (Table 2).

Practice of post exposure prophylaxis of HIV among private practitioners

In our study out of 150, 12 (8 %) had accidental exposure to HIV in the past. Only 8 (67%) received HIV-PEP after exposure. Out of 8, 3 (38%) completed the full HIV-PEP course. The reasons for not commencing HIV-PEP were:

- 1. Not aware of PEP protocol at that time.
- 2. Assumed exposure source was negative.

DISCUSSION

In the present study 92 % had NSI in their life time and 15% in the last one year and almost similar finding was observed by fullerton M et al (17.8% in the last one year) and Bayapa Reddy N et al (84.8% in their life time and 15.7% in the past three months. ^{16,17} In a study conducted by Patricia A et al, 69.4% of the respondents reported history of needle stick injuries. ¹⁸

In the present study 47% had needle stick injury only once which is higher than the study conducted by yousafzai et al (26.7%) and lower than study conducted by fullerton et al (75.6%). In the present study 42% had 2-5 times in the last one year and which is lower than study conducted by fullerton et al (21.9%).

In the present study most of the participants had NSI while recapping the needle and similar finding was observed in the study conducted by Yousafzai et al and bayappa reddy N et al. ^{17,19} In the present study the most common factor influenced NSI was hasty work and similar finding was observed in the study conducted by Bayappa Reddy N et al. ¹⁷

In our study all private practitioners had heard of HIV post exposure prophylaxis (PEP) and almost similar finding was observed by Patricia A et al (98%). Our study observation is higher than the other studies conducted by C Ooi et al (68%) and Biniam Mathewos et al (48%). In the present study 81% told HIV (PEP) is effective in preventing HIV transmission, which is lower than study conducted by Patricia A et al (99.4%). It is higher than study conducted by Biniam Mathewos et al (60.5%). In the present study Biniam Mathewos et al (60.5%).

In our study 55% respondents correctly identified the risk of transmission of HIV from a NSI to be around three per 1000 injuries and similar finding was observed by Patricia A et al. Regarding knowledge of various high risk body fluids for HIV transmission, the following proportions were obtained for correct identification of the following body fluids as high risk for HIV transmission: breast milk 93%, peritoneal fluid 69% and 19% incorrectly identified urine, saliva and faeces respectively as high-risk fluids for HIV transmission and almost similar finding was observed by Patricia et al. 49% and 39% identified mucous membrane exposure and percutaneous injuries were high-risk exposures for HIV transmission respectively. Our study observations are lower than study conducted by Patracia et al.

52% told PEP should be commenced as soon as possible/within 72 hours which is higher than study conducted by patracia et al (93.9%) and Bayappa Reddy N et al (80%). ^{17,18} In the study conducted by C Ooi et al 24.6% were aware of the 72 hour time restrictions. ²⁰

In our study 31% answered correctly the ideal HIV-PEP regimen following high risk needle stick injury and similar finding was observed by patracia et al (32.7%). In present study 71% answered correctly the duration of HIV-PEP which is lower than study conducted by Patracia et al. 18 91% told HIV-PEP should be administered for accidental non-occupational exposure to HIV which is higher than study conducted by Patracia et al (61%). 18

In the present study 8% had accidental exposure to HIV which is lower than study conducted by Getahun Kebede Beyera et al (Of 162 HCWs) and study conducted by Biniam Mathewos et al (33.8%).²¹ In our study 67% received PEP compare to 25.3% in the study of Getahun Kebede Beyera et al.²¹ and 74.2% in Biniam Mathewos et al.²²

CONCLUSION

We conclude that Needle Stick Injuries (NSI) were common among private general practitioners. Majority of the respondents had needle stick injuries at least once in their life time. Majority of them had NSI while recapping needle and injection procedure. Most common cause for NSI was heavy work load followed by inattention and hasty work. Majority of the study participants had good level of awareness on PEP. Despite of good level of awareness they fail to practice HIV PEP following accidental exposure to HIV/ AIDS risk factors. So a knowledge-practice gap is existing among private general practitioners.

Recommendations

- 1. Further research in large scale is needed to determine the actual incidence of NSI and sharp injury exposure.
- 2. There is a need to include universal precautions, biological waste disposal and PEP as a continued education workshop for medical practitioners.
- 3. Medical practitioners have to be serious about needle stick injuries, protecting themselves with Hepatitis B vaccination, universal precautions, and post-exposure prophylaxis for HIV.
- 4. Private general practitioners should provide written guidelines and protocols of HIV PEP at the workplace.

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Institutional Ethics Committee

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