

**Original Article****Study and analysis of occupational exposure leading to blood borne infection among Health care workers**

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**ABSTRACT**

**Background:** Occupational exposure carries significant risk of transmission of blood borne infection to Health care worker. In developing country like India awareness about using universal precautions and post exposure prophylaxis with documentation of exposure is poor.

**Objective:** To study and analyze “occupational exposure” among HCW that lead to blood born infections.

**Methodology:** This retrospective study analyzes the self reported cases of exposure in Sir T.Hospital, Bhavnagar, in year 2012-2014 of 70 health care worker. Data regarding frequency, category and mode of exposure along with clinical practice that lead to exposure is noted and tabulated.

**Results:** Majority of category of exposure is nursing students (29%) and most common clinical practices that lead to exposure is during blood withdrawal(45%).

**Conclusion:** Most importantly if all exposed cases documented and source for HIV positivity can be traceable; PEP can be initiated timely and helpful in reducing incidence of HIV. So need for such type of study and creating awareness in all organization

**Key words:** Occupational exposure, Post-exposure prophylaxis (PEP), Health care workers

**INTRODUCTION**

HCWs (Health care workers) are at risk of “Occupational exposure” by percutaneous injury (eg.Needle stick or sharp instrument cut),Contact of mucous membrane of eye or mouth, Contact with non intact skin(eg.abraded skin) or contact with intact skin when duration of contact prolonged(eg.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].

By “Occupational exposure” patients are at risk of transmission of blood borne pathogens like HIV, Hepatitis etc. In developing countries, In HCWs awareness about post exposure prophylaxis and use of universal precautions is suboptimal [2,3].

There are only few study regarding exposure frequency. Post exposure prophylaxis(PEP) protocols followed and consequences of exposure [4-6]. So, we have done retrospective study to analyze self

reported cases of occupational exposure in our hospital.

**OBJECTIVES**

1. To study and analyze “occupational exposure” among HCW that lead to blood born infections
2. To study nature and circumstances under which “occupational exposure” occurred.

**MATERIALS AND METHODS**

Any HCWs exposed to blood or body fluids report to ART (Anti Retroviral therapy) centre and then referred to ICTC (Integrated counseling and testing centre) of our hospital for HIV testing. All Health Care Workers of Sir T. Hospital, Bhavnagar enrolled for the study. Both pre and post test counseling of patient done and register maintained with details like personal details of HCW, place of work, time, date and type of injury, time of reporting of injury and any actions by HCW has been recorded. We have done cross sectional

study regarding occupational exposure among HCWs from the available data record of ART centre and ICTC records from the year 2012 to 2014. All data regarding category, frequency, mode of exposure and clinical practice that lead to exposure are plotted in table and analysis done that is explained in results and discussion part. As per NACO guidelines, sample of HCWs tested for HIV and PEP initiated according to risk of exposure. Then follow up testing done at 6 week, 12 week and 6 month. Blood sample also tested for HBsAg.

**RESULTS**

Total 70 HCWs sustained occupational exposure to blood and body fluid from year 2011-14. Among them 07 were post graduate student, 03 were intern, 08 were staff nurse, 20 were nursing students, 06 were lab technician, 09 were -paramedical staff, 11 were doctors and 06 were servants [Table 1].

**Table 1: Category of Medical and Paramedical staff having occupation exposure to HIV**

CATEGORY	2012	2013	2014	TOTAL
Post graduate student	02	03	02	07(09%)
Interns	01	00	02	03(04%)
Staff nurses	01	05	02	08(12%)
nursing students	04	09	07	20(29%)
lab technician	02	03	02	06(9%)
Paramedical staff	03	02	04	09(13%)
Doctors	01	08	02	11(16%)
Servent	01	03	02	06(08%)

Blood was the most common body fluid associated with occupational exposure. Most common type of exposure is by percutaneous needle stick injury accounting for 82% followed by mucous membrane splash (14%) and intact skin exposure(4%) [Table 2]

**Table 2: Mode of exposure**

TYPE OF EXPOSURE	NO.OF PERSON EXPOSED
Intact skin	03(04%)
Mucosal membrane splash	10(14%)
Percutaneous exposure	57(82%)

The analysis revealed that occupational exposure occurred 45% during blood withdrawal, 19% during surgical procedure, 20% by improper disposal of sharp, 14% by transferring of needle and 2% by biopsy related procedure [Table 3]. A large proportion occurred because of incorrect handling such as recapping and improper disposal of the sharps. About 10% of HCWs reported the occupational exposure from 2 days to 1 month after the incident.

**Table 3: Clinical practices leading to occupational exposure**

CLINICAL PRACTICES	NO.OF PERSON EXPOSED
Blood withdrawal	31(45%)
Surgery	13(19%)
Improper disposal of sharps	14(20%)
Transferring of needle	10(14%)
Biopsy	02(02%)

Among all known source of exposure, 20 were positive for HIV and 3 were positive for hepatitis B. Out of 20 HCWs who were exposed to HIV positive cases only 6 HCWs reported for continuous follow up 6 week, 12 week, and 6 month showing poor health seeking behavior and ignorance but they were sero-negative for HIV in subsequent testing.

**DISCUSSION**

Percutaneous injury by needle stick and other sharps carries significant risk of transmission of blood borne pathogens to HCWs. This study also includes the nature and circumstances of exposure. The causes include various factors like type of needle, bore of needle, recapping of needle, transferring specimen, during clean up procedure, handling devises etc [7].

In our study, nursing students were most prone for occupational exposure (29%) followed by doctors (16%). In a study conducted by Muralidhar et al 2010 [8], intern doctors contribute most followed by residents of needle stick injury..

In our study most common clinical practice that lead to occupational exposure is during blood withdrawal(45%) followed by improper sharp disposal(20%) and surgical procedures(19%).This was similar to study conducted by Jayanth et al.2009,<sup>[9]</sup>where blood collection contribute to 59.3%,surgical procedure 22%,recapping 8.5% and improper sharp disposal 18.6%.

In this study 20 source cases were HIV positive and PEP started in all these cases. They all advised for complete follow up but only 6 cases were reported for complete follow up period and were found HIV negative after 6 month. This was similar to study by Rele et al [6] in which 10 staff that exposed to known HIV source remained sero-negative after the complete follow up period.

## CONCLUSION

It is concluded that among all category of the workers staff nurse had the highest exposure. Most common mode of exposure is percutaneous and blood withdrawal is the commonest activity during which staff encountered an occupational exposure occurred. Poor follow up testing of positive exposure is seen among staff.

## RECOMMENDATIONS

Infection due to blood borne pathogen can be greatly reduced by infection controlling guidelines and taking universal precautions. In developing country epidemiological analysis occupational exposure among HCWs is not well documented and need awareness [10].

Here, risk may low but psychological trauma and legal implications following injury is considerable [8].

All health care organizations should train HCWs for how to prevent exposure and importance of documentation of exposure, If possible reporting need to be mandatory.

Most importantly if all exposed cases documented and source for HIV positivity can be traceable, PEP can be initiated timely and helpful in reducing incidence of HIV. So need for such type of study and creating awareness in all organization.

## REFERENCES

1. Guidelines on HIV testing.Ministry of Health and family welfare.National AIDS control organization.127-132,March 2007.Available at <http://naco.gov.in/upload/Policies%20&%20Guidelines/5-GUIDELINES%20FOR%20HIV%20TESTING.pdf>.

2. Shriyan A, Roche R, Annamma. Incidence of occupational exposures in a tertiary health care center. Indian j Sex Transm Dis 2012;33:91-97.
3. WHO.Reducingrisks.Promoting Healthy Life.The World Health Report 2002.Geneva :World Health Organisation;2002;32-45.
4. Chogle NL, Chogle MN, Divatia JV, DasguptaD.Awareness of post exposure prophylaxis guidelines against occupational exposure to HIV in a Mumbai hospital.Natl Med j India 2002;15:69-72.
5. Tetali S, Choudhury PL.Occupational exposure to sharps and splash: Risk among health care providers in three tertiary care hospitals in South India.Indian j Occup Environ Med 2006;10:35-40.
6. Rele M, Mathur M, TurbadkarD.Risk of needle stick injuries in health care workers-A report.Indian j Med Microbiol 2002;20:206-7.
7. Pery j, Parker G, Jagger j.EPINET report:2003 percutaneous injury rates.Adv Expo Prev 2005;7:2-45.
8. Muralidhar S, Singh PK, Jain RK, Malhotra M,BalaM.Needle stick injuries among health care workers in a tertiary care hospital of India.Indian j Med Res 2010;131:405-10.
9. Jayanth ST, Kirupakaran H, Brahmadathan KN, Gnanaraj L, Kang G.Needle stick injuries in a tertiary care hospital.Indian j Med Microbiol 2009;27:44-7.
10. Kermode,M,JolleyD,LangkhamB,ThomasMS,Croft sN.Occupational exposure to blood and risk of bloodborne virus infection among health care workers in rural north Indian health care settings.Am j Infect Control 2005;33:34-41.

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