



AWARENESS OF BLOOD BORNE INFECTIONS AND THE BURDEN OF OCCUPATIONAL EXPOSURE TO BLOOD AND BODY FLUIDS AMONG HEALTH CARE PERSONNEL IN A TERTIARY CARE TEACHING HOSPITAL

Community Medicine

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ABSTRACT

Introduction Exposure to blood and body fluid pose a serious risk to health care professionals and they are most often underreported. The present study aimed to assess the awareness of blood borne infections and to quantify the burden of exposure among the health care personnel. **Materials and Methods** This cross sectional study was conducted among 180 health care professionals of a tertiary care teaching hospital. The participants were divided into two groups. A self administered questionnaire was used to assess the awareness level and burden of exposure over a period of one year. **Results** There were 90 participants in Group A consisting of consultants, residents and medical interns. Another 90 participants in Group B consisted of Lab technicians, Staff nurses, Nursing students, Nursing Interns and Nursing Assistants. Awareness level regarding universal precautions was good, however awareness regarding post exposure prophylaxis was poor. Also awareness regarding the place of availability of post exposure prophylaxis was poor. The proportion of health care personnel exposed was 45.5%. **Conclusion** Even though the awareness regarding universal precautions was good, it did not translate into practice and this is the reason for the high exposure rate among the health care professionals. There is an urgent need to create awareness regarding the occupational exposures in health care settings and ways to prevent them. Regular reinforcement of such training is also essential.

KEYWORDS

Awareness, Blood Borne Infection, Occupational exposure, Post exposure prophylaxis.

INTRODUCTION

Hospital is considered as a part of the health care industry wherein people are given diagnostic, preventive, remedial and therapeutic services. Workers in a health care industry, like any other worker elsewhere, may encounter physical, chemical, ergonomic or psychosocial hazards. In health services, however, there are occupational hazards, particularly infectious pathogens, which require special preventive and protective measures¹.

Blood borne infectious pathogens can be transmitted when blood or body fluid from an infected person enters another person's body via needle sticks, splashes, human bites, cuts, abrasions, or through mucous membrane². In hospital settings, injuries due to needles or sharps pose a great risk towards occupational transmission of blood borne infections to health care workers. Any body fluid with blood is potentially infectious. Also, semen, vaginal secretions and saliva during dental procedures are considered potentially infected body fluids³. Health care workers are thus prone to a variety of blood borne infections which may include HIV/AIDS, Hepatitis B, Hepatitis C, Malaria, Herpes, Tuberculosis, Brucellosis, Spotted fever and Syphilis etc⁴. It is said that the HCWs are exposed to over 20 different blood borne pathogens due to such injuries and this results in an estimated 1000 infections per year⁵.

According to WHO, approximately 66000 HBV, 16000 HCV and 200-5000 HIV accidental infections occur in health care workers each year⁶. These infections are not only a burden to the individual and family in terms of illness, disability and death, but also pose a serious economic burden to the country and also reduce a significant healthy work force. A worrying issue is that these numbers might not actually reflect the real burden as many cases go unnoticed or underreported.

There is gross underreporting of occupational exposures in our country and exposure data at national level is lacking⁷. The objectives of the present study are to assess the awareness of blood borne infections and to quantify the burden of exposure among the health care personnel.

MATERIALS AND METHODS

A cross sectional study was conducted among health care professionals of a tertiary care hospital in Dakshina Kannada district of Karnataka, India. Sample size was calculated based on a study⁷ where the awareness level among health care professionals was 56% and 46% in two groups, calculated using the formula, $\left[Z^2 \cdot \frac{P_1(1-P_1) + P_2(1-P_2)}{d^2} \right]$ with z at 95% and confidence interval was 1.96. The minimum sample size was calculated to be 86 which was rounded off to 90.

A semi structured questionnaire was used to collect information. Data on exposure was limited to preceding 12 months only to avoid recall bias. Ward attenders and house keeping staff were excluded from this present study.

Exposure was defined as skin prick, cut or scratch injury from needles, scalpel blade, scissors or any other sharps contaminated with BBFs, cutaneous or mucosal splash exposure to BBFs. The study instrument was reviewed by a team of public health experts, ethical committee and a biostatistician. The tool was then modified based on expert suggestions. Pilot testing of the questionnaire was also done among five health care personnel of different work category. Clearance was obtained from the institutional ethical committee before the start of the study.

The health care personnel working in the hospital were first enlisted. They were then divided into two groups as doctors group and other allied health personnel group and were assigned serial numbers. Interns, residents and specialists were included in the doctor's group. Nurses and lab technicians were included in the allied health personnel group. Computer generated random numbers were used to select 90 people from each group.

The investigator met each subject individually and explained the purpose of the study and the anonymity assured before obtaining informed written consent. The subjects were instructed to go through the tool and were asked to complete it. In case of any doubt, the investigator was present at the scene to clarify the same. The collected data was entered daily in Microsoft Office Excel 2007.

Statistical Analysis:

IBM SPSS Version 17 was used for analysis of data. The data is presented as frequencies, percentages, mean and standard deviation. Chi square test was used to find if there was any statistically significant difference between the two groups.

RESULTS

Among the 90 participants in the doctor's group (Group A), 52% were medical interns, 32% were residents and 16% were consultants. Other allied health professional group (Group B) contained 34% staff nurses, 29% lab technicians, 21% nursing students, 8% nursing interns and another 8% of nursing assistants. Lab technicians and Nursing students belonged to the youngest age group with mean age of 19.

Consultants were of the higher age group with mean age of 40. Consultants and staff nurses had the highest work experience with

mean duration of 95 months and 70 months respectively. All the nurses and most of the lab technicians (85%) belonged to the female gender.

The questionnaire contained questions to assess awareness on concepts of blood borne infection, about HIV and Hepatitis B post exposure prophylaxis, and awareness about availability and place of availability of post exposure prophylaxis in the hospital. The proportion of awareness among different professions are tabulated in Table 1.

Exposure status of participants is tabulated and it can be seen that the exposure was more among the second group when compared to those in the first group (Table 2). But this difference was not statistically significant (chisquare value=0.806, df=1, p value=0.369). Department wise stratification of these professionals were done and it was seen that participants in Forensic medicine and casualty had 100% exposure followed by dermatology and central lab. Blood (84%) was the most common fluid to which the participants were exposed to, followed by amniotic fluid (8.5%), peritoneal fluid (4.8%) and CSF (2.4%). Hands and fingers were the most commonest body part exposed accounting for 91.4%, followed by eyes (4.87%) and damaged skin (3.65%). Percutaneous exposure (88.5%) was the most common type of exposure, followed by mucocutaneous exposure (4.6%). The procedures which were commonly associated with exposure were blood sampling (35.36%), during a surgical procedure (23.17%) and during intravenous administration (12.19%). 82% of the lab technicians reported about their exposure to their seniors. Otherwise the reporting status was bad among other professionals.

DISCUSSION

Every year there are many health care professionals who face the risk of blood borne diseases due to occupational exposure. The awareness level regarding the blood and body fluid exposure and subsequent infection among the health care professionals was poor and more so among the allied health care professionals. Awareness regarding universal precautions was good, however awareness regarding post exposure prophylaxis to Hepatitis B and HIV was poor. Similar low level of awareness were noted in other studies conducted in India^{8,9}. Doctors had the highest awareness regarding the post exposure prophylaxis which is similar to a study done in India¹⁰. Only 48.8% of the participants knew about the availability of post exposure prophylaxis in the hospital. This is lesser than that seen in other Indian studies^{7,10}. There is an urgent need to educate the health care professionals regarding the importance of timely post exposure prophylaxis and the place of obtaining them in the hospital.

The present study revealed that the proportion of health care personnel exposed in the tertiary care hospital was 45.5%. This is similar to estimated pooled 12 month prevalence in Ethiopia¹¹ which was 44.2%. There was a slightly higher proportion of exposure in a hospital in Turkey¹² accounting for 58%. Another study in Mumbai, India¹³ reported the incidence to be 32.75% which is lesser than the present study. The higher burden of exposure might be because of lower adherence to barrier precautions. The burden of exposure was higher among lab technicians, staff nurses and residents. This is probably because blood sampling and intravenous cannulation is usually done by these professionals in the tertiary care hospital.

82% of the lab technicians reported their exposures to their seniors, otherwise the reporting system was very poor. The stigma associated with blood borne infections, fear that the result might turn positive, and its subsequent consequences on career are some factors which hinder the reporting in case of exposures. To improve the process of reporting, it should be made very simple. Installation of an electronic reporting system or an app based reporting system might improve the process of reporting.

Percutaneous exposure was the most commonest form of exposure and hands were the most common region of exposure. Blood sampling was the most common procedure during which they were exposed. This might be due to two hand recapping of the needles. Many Indian studies^{10,14,15,16} have recorded exposure of 8-34% secondary to recapping of needles. Thus there is an urgent need to educate our health care professionals regarding this and to give up this practice. There is also a need to repeatedly reiterate this at frequent intervals.

CONCLUSION

The awareness levels with regards to blood and body fluid exposure

and subsequent infection was poor among the health care professionals and more so among the allied health care professionals. The proportion of health care personnel exposed in the tertiary care hospital was 45.5%. Maximum exposure was seen among the allied health care professionals accounting for 48.8%.

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Conflict of Interest: Nil

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Data Availability:

All data analysed during the study are included in the manuscript.

Ethics statement:

Approval from Institutional ethics committee was obtained before the start of the study. This article does not contain any intervention on the participants.

Table 1: Awareness About Blood Borne Infection Among The Participants

Profession (NO.)	Aware of Concepts of Blood Borne Infection NO. (%)	Aware of HIV Post Exposure Prophylaxis NO. (%)	Aware of Hepatitis B Post Exposure Prophylaxis NO. (%)	Aware of availability and place of availability of Post Exposure Prophylaxis NO. (%)
Consultants (14)	11 (78.57%)	8 (57.14%)	5 (35.71%)	10 (71.42%)
Medical Interns (47)	26 (55.31%)	10 (21.27%)	7 (14.89%)	28 (59.57%)
Residents (29)	20 (68.96%)	15 (51.72%)	7 (24.13%)	19 (65.51%)
Lab Technicians (26)	8 (30.76%)	1 (3.84%)	1 (3.84%)	4 (15.38%)
Staff Nurses (31)	6 (19.35%)	2 (6.45%)	1 (3.22%)	20 (64.51%)
Nursing Students (19)	3 (15.78%)	0 (0%)	0 (0%)	4 (21.05%)
Nursing Interns (7)	3 (15.78%)	0 (0%)	0 (0%)	2 (28.57%)
Nursing Assistants (7)	4 (57.14%)	0 (0%)	0 (0%)	1 (14.28%)

Table 2: Exposure Status In Different Occupations

Group	Occupation	No.Of Participants	Exposed Participants No. (%)
Group A	Consultants	14	6 (42.85%)
	Medical Interns	47	17 (36.17%)
	Residents	29	15 (51.72%)
	Total	90	38 (42.22%)
Group B	Lab Technicians	26	17 (65.38%)
	Staff Nurses	31	18 (58.06%)
	Nursing Students	19	5 (26.31%)
	Nursing Interns	7	1 (14.28%)
	Nursing Assistants	7	3 (42.85%)
	Total	90	44 (48.88%)

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