

Awareness of Health Care Workers Regarding Prophylaxis for Prevention of Transmission of Blood-Borne Viral Infections in Occupational Exposures

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Abstract:

Context: There has been a need to assess the awareness of health care professionals regarding post exposure prophylaxis for various blood-borne viral infections.

Aims: To study and compare the awareness regarding transmission and post-exposure prophylaxis (PEP) for prevention of transmission of HIV, Hepatitis B virus and Hepatitis C virus amongst medical (Resident Medical Officers- RMOs and Interns) and paramedical professionals (nurses and technicians).

Settings and Design: Cross-sectional study at a tertiary health care hospital in Mumbai (INDIA) with a medical college.

Methods and Materials: A total of 304 RMOs (Resident Medical Officers), 100 interns, 201 nurses and 50 technicians answered a structured questionnaire. Their responses were analyzed as percentages. Inter-group comparisons were performed using the chi-square method between junior & senior RMOs, RMOs & nurses, RMOs & interns and RMOs & technicians.

Statistical analysis used: Chi-square test (p value of <0.05 was considered to be significant).

Results: Knowledge about the fact that the exposed site must be immediately washed with soap and water was higher in RMOs and interns (73.03% and 83% respectively) as compared to nurses and technicians (40.8% and 58% respectively). Awareness about the basic and expanded HIV PEP regimens was lower in RMOs (35.2% and 20% respectively) than interns (62% and 24%). Knowledge about whom to contact for PEP was good among the RMOs, interns and nurses (55.9%, 83% and 57.7% respectively) but low amongst technicians (20%). 18.1% of the RMOs, 24% of interns, 19.4% of nurses and 10% of technicians have had prior occupational exposure.

Conclusions: Knowledge base of the nurses and technicians lagged behind that of the RMOs. The knowledge of interns was comparable and in many aspects better than that of RMOs. The knowledge base of junior (1st and 2nd year) and senior (3rd and 4th year) RMOs was similar. The study indicates the need to reinforce the knowledge of RMOs regarding various aspects of PEP and to undertake more training workshops for the same amongst nurses and technicians.

Key-words: Blood, HIV, Interns, Medical Officers, Nurses, Technicians, Virus

Key Message: The knowledge of resident doctors, nurses and technicians regarding various aspects of PEP like the immediate steps to be taken after an exposure, the PEP regimens, whom to contact in the institution for obtaining PEP as also HBV vaccination is not adequate and there is a need to conduct CMEs and workshops for upgrading the same.

Introduction

A health care worker (HCW) has a small but significant occupational risk of transmission of blood borne viral infections including hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) [1]. It is important

to create a knowledge base about the awareness regarding post exposure prophylaxis (PEP) recommended for prevention of their transmission in various HCWs so as to help plan adequate training programmes and minimise the risk. Prior such studies have not taken sufficient medical staff or any paramedical staff into consideration [1-6]. The present study was carried out to study and compare the awareness regarding transmission and PEP for prevention of transmission of HIV, HBV and HCV amongst various medical (Resident Medical Officers - RMOs and interns) and paramedical professionals (nurses and technicians).

Methods:

Study Location: Tertiary care teaching hospital affiliated to Medical College from Mumbai (India). Study Design: Cross sectional study conducted over a period of 2 months in year 2005. A structured questionnaire was designed to assess the knowledge of health care workers (HCWs) and paramedics regarding blood-borne viral infection transmission. The study was conducted after permission from the institutional ethics committee. The structured questionnaire was administered to 304 RMOs (76 first year RMOs, 96 second year RMOs, 83 third year RMOs and 49 fourth year RMOs), 100 interns, 201 nurses and 50 technicians (total sample size 655). They were explained about the study, written informed consent was obtained as per the Ethics Committee guidelines and they were requested to answer the questionnaire. Their responses were analyzed as percentages. Inter-group comparisons were performed using the chi-square method of statistical significance between junior and senior RMOs, RMOs & nurses, RMOs & interns and RMOs & technicians.

Results

Some of the important questions asked and the percentage of appropriate answers obtained from the various groups have been tabulated in **Table 1**. As shown in table 1, 73% RMOs, 83% interns, 41% nurses and 58% technicians knew that the exposed site must be immediately washed with soap and water. Awareness about the basic and expanded HIV PEP regimens was lower in RMOs (35% and 20% respectively) than interns (62% and 24%). 18.1% of the RMOs, 24% of interns, 19.4% of nurses and 10% of technicians have had prior occupational exposure. 87% RMOs, 96% interns and 60% technicians have been vaccinated against HBV, whereas only 34% nurses have been vaccinated for the same. In inter-group comparison, senior RMOs (3rd and 4th year) had a significantly higher knowledge compared to junior RMOs (1st and 2nd year) regarding whom to contact in the hospital for obtaining PEP as also which is the immediate step to be taken following occupational exposure ($p < 0.05$). Interns were more aware of the above two questions than the RMOs ($p < 0.05$), as also regarding the basic regimen for HIV PEP and that no PEP is needed for HCV prophylaxis. The knowledge base regarding the other questions showed no significant differences between the two. Nurses' knowledge lagged far behind RMOs in all fields, except for the query on whom to contact for PEP in the hospital and

regarding past occupational exposure, in which there was no significant difference. Technicians' knowledge was significantly less than RMOs in almost all fields.

Table 1: Responses of the health care professionals to certain important questions in the questionnaire.

Question	RMOs (%)	Nurses (%)	Interns (%)	Technicians (%)
Whether CME attended	10*	13*	35*	8*
Which are BBV infections	95	28	94	38
No PEP for intact skin exposure	83.5	41	91	16
When to start PEP	74	64	89	46
Basic PEP regimen for HIV	35.2	1	62	-
Expanded PEP regimen for HIV	20	-	24	-
Immediate PEP for prick	73	41	83	58
Where to get PEP in hospital	56	58	83	20
Vaccinated for HBV or not	87*	34*	96*	60*
PEP needed for HCV or not	23	13	34	10
Whether exposed to BBV	18.1* (55 RMOs)	19.4* (39 nurses)	24* (24 interns)	10* (5 technicians)
Ever taken PEP	9* (27 RMOs)	3.5* (7 nurses)	24* (24 interns)	2* (1 technician)

* = Yes

Discussion

Though the topic of PEP is a vitally important one, there is paucity of literature on the topic, particularly when it comes to the knowledge base of interns, nurses and technicians. The present study shows that 18.09% residents have had occupational exposure. This figure is much less than the 79.4% stated in the study by Wig *et al* [2] and 34% documented by Scoular *et al* [3]. These variations may be possibly due to under-reporting, better adherence to universal safety precautions, as well as prior knowledge about the high-risk cases, which need to be handled carefully. Stein *et al* stated that 37% of the respondents (doctors and nurses) had suffered a needle-stick injury with a used needle, with doctors more likely to be injured than nurses [4]. This is in contrast to our study which indicates that there is such significant difference (18.09% doctors and 19.4% nurses have had a previous occupational exposure). Chen *et al* documented that 76% of the junior residents had experienced high-risk occupational exposure to potentially infective material at some stage in their careers and that 18% had sought advice about PEP following these [5]. Our results show that 73.02% doctors knew that the exposed site must be immediately washed with soap and water. This compares well with 78% in the study conducted by Chogle *et al* [6]. The fact that PEP should be started as soon as possible (within 2 hours after exposure as per hospital guidelines) was known by 74.01% doctors, as against 36%, 64%, 38.4% and 29% reported by Wig *et al* [2], Chogle *et al* [6], Duff *et al* [7] and Chen *et al* [5] respectively. Knowledge about the basic and expanded regimens of PEP was 35.19% and 20.06% RMOs respectively in our study. This is more than the 8% reported by Chen *et al*. [5] Similarly, Chogle *et al* documented that 42% were aware of the use of zidovudine but none were aware of the second (basic) or third (expanded) drugs used for PEP [6]. Scoular *et al* too reported that only 13% respondents knew that a regimen consisting of more than one drug is now recommended [1,3]. The reasons for better knowledge base in our study population of doctors might include better sensitization, availability of institutional guidelines, rising incidence of HIV, prior experience of self/peers as well as past training on the subject of PEP. Our study indicates that 55.92% doctors are aware of whom to contact after a needle-stick injury to obtain PEP. In the study conducted by Chogle *et al*, less than 33% were aware of this fact [6] while in that carried out by Duff *et al*, 7.6% knew about whom to contact [7]. Availability of institutional guidelines and wide publicity of PEP available in the institution premises is a must for reducing the time interval between the occupational exposure and the first dose taken. Our study shows that 87.17% of doctors are vaccinated against HBV. This is comparable to the 87.7% reported by Wig *et al* in their study [2]. Also, only 34% nurses and 60% technicians were vaccinated against HBV in our study. The available medical literature does not adequately address the issue of PEP knowledge base of HCWs regarding modes of transmission and PEP for Hepatitis B and C viruses. Also there exist very few references comparing the knowledge of doctors with paramedical staff (nurses and technicians). Our study is a systematic attempt to study the same. We noted that the knowledge base of interns is comparable to, and in certain points, significantly better than that of RMOs. This is probably due to a well planned orientation program

conducted for the interns prior to the beginning of their internship, which was attended by 35% of them, a significantly high percentage as compared to the RMOs. The knowledge base of nurses and technicians is highly inadequate regarding BBV infections and their PEP. However, the nurses' knowledge is comparable to the RMOs as far as immediate steps to be taken post-exposure are concerned (wash with soap and water) as also where to obtain PEP from (which is probably what is essential for them to know). Unfortunately, the same cannot be said about the technicians, and their knowledge base needs drastic improvement.

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References

1. Centers for Disease Control and Prevention. Updated US Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Post-exposure prophylaxis. MMWR 2001; 50 (No. RR-11).
2. Wig N. HIV: awareness of management of occupational exposure in health care workers. Indian J Med Sci 2003;57:192-198.
3. Scoular A, Watt AD, Watson M, Kelly B. Knowledge and attitudes of hospital staff to occupational exposure to bloodborne viruses. Commun Dis Public Health 2000;3:247-9.
4. Stein AD, Makarawo TP, Ahmad MF. A survey of doctors' and nurses' knowledge, attitudes and compliance with infection control guidelines in Birmingham teaching hospitals. J Hosp Infect 2003;54:68-73.
5. Chen MY, Fox EF and Rogers CA. Post-exposure prophylaxis for human immunodeficiency virus: knowledge and experience of junior doctors. Sex Transm Infect 2001;77:444-5.
6. Chogle NL, Chogle MN, Divatia JV, Dasgupta D. Awareness of post-exposure prophylaxis guidelines against occupational exposure to HIV in a Mumbai hospital. Natl Med J India 2002;15:69-72.
7. Duff SE, Wong CKM, May RE. Surgeons' and occupational health departments' awareness of guideline on PEP for staff exposed to HIV: telephone survey. BMJ 1999; 319: 162.

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