ORIGINAL ARTICLE

Awareness of Post-Exposure Prophylaxis Guidelines Against Occupational Exposure to HIV in Hospital Sungai Petani

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Summary

Occupational risk of Human Immunodeficiency Virus (HIV) infection is a matter of concern for health care workers. We conducted a study to gauge the level of awareness amongst HCW (doctors and nurses) working in Hospital Sungai Petani regarding the post-exposure prophylaxis in case of needle stick injuries from confirmed or suspected cases of HIV. Nineteen Doctors (56%) and 13 nurses (25%) were aware of correct risk of transmission. None identified all the four risk fluids correctly. 94% of doctors and 98% of nurses correctly stated that washing the site with soap and water is the initial procedure, but only few (1/10 of doctors and 1/3 of nurses) knew whom to contact immediately after injury. Twenty three doctors (67%) and 41(78%) nurses were aware of the use of Zidovudine but only 10 participants were aware of the use of second drug. Only 6 doctors (17%) and 8 nurses (15%) knew the correct duration of post-exposure prophylaxis. Twenty-three doctors (67%) and 35 nurses (67%) knew that the drugs were available in Hospital Pharmacy and 11 doctors and 12 nurses knew the approximate cost of therapy. On the average about 50% of doctors and nurses have fair knowledge of post exposure prophylaxis against HIV. Ongoing awareness and training are necessary to improve the same.

Key Words: Human immunodeficiency virus, Post exposure prophylaxis, Healthcare workers, Needle stick injury, Zidovudine

Introduction

Human Immunodeficiency Virus (HIV) infection status of a majority of patients is not known at the time of initial presentation to the hospital. Therefore exposure to HIV is a matter of concern for Health Care Workers (HCW). In USA, 52 confirmed cases of occupational transmission of HIV had been documented till 1997 by the Centre for Disease Control[CDC][1]. In Malaysia, occupational exposure to HIV among HCWs is an increasingly common problem as the incidence and prevalence of HIV infection continues to rise[2]. Seroprevalence of HIV in Malaysia is about 0.2% in the general population[3]. Despite following "Universal Precautions" in performing procedures doctors may experience percutaneous injuries. Moreover a number of confirmed cases of HIV infection due to accidental occupational exposure have been documented recently[1]. Guidelines have been formulated by CDC, Atlanta to prevent disease transmission to HCWs[1]. In Malaysia, the CONT (Consensus on Antiretroviral Treatment) provides guidelines for post-exposure prophylaxis against HIV[2]. These guidelines are formulated by a panel consisting of 16 Physicians and

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10 Paediatricians. These guidelines are published periodically by Ministry of Health, Malaysia. Each time it is reviewed or updated about 20 copies of these guidelines are sent to each hospital by Ministry of Health to be distributed to doctors and other HCWs. In addition, one copy will be made easily available in each wards of the hospital. Periodic lectures on these guidelines are also arranged in the hospital for HCWs. A number of reviews in the literature have specifically highlighted the role of post exposure prophylaxis for the prevention of HIV transmission[4,5]. The main goal of post-exposure prophylaxis is to prevent HIV infection among those sustaining exposure and to provide information and support during the follow-up interval until infection is diagnosed or excluded with certainty. To achieve the goal the HCWs must have sufficient knowledge of post-exposure prophylaxis. Hence, we carried out a survey amongst HCWs (doctors and nurses) working in the Hospital, Sungai Petani, Kedah Darul Aman to assess their awareness regarding the risk of transmission and post-exposure prophylaxis in case of accidental needle-stick injury from a confirmed or suspected case of HIV.

Materials and Methods

Informed written consent was obtained from the participants before starting the survey. A questionnaire was presented to 34 doctors and 52 nurses on 16 June 2003. All the participants had been working in the hospital for at least 1 year. The questionnaire was given to them individually in their working area. The questions asked were:

1. What percentage of needle-stick injuries from patients with known HIV infection are likely to result in transmission to the recipient?
2. Which four of the following eight body fluids (presuming that they are not blood stained) may be considered as "high risk" for transmission of HIV: synovial fluid, saliva, faeces, urine, peritoneal fluid, pleural fluid, cerebrospinal fluid (CSF), vomitus?
3. Who should be contacted in the event of needle-stick injury?
4. What first - aid procedure should be performed at the needle-stick site?
5. How soon after a needle-stick injury should post-exposure prophylaxis commence?
6. What drugs does post-exposure prophylaxis consist of?
7. Are the drugs for post-exposure prophylaxis available when needed (if yes, where)?
8. For how long is post-exposure prophylaxis administered (duration)?
9. What is the approximate cost of a complete post - exposure prophylaxis schedule?

Strict confidentiality of the answers was maintained and participants were advised not to discuss among themselves. The responses were sealed, collected and analysed with the CDC guidelines (1998) as the reference Standard[1].

Results

The answers given by 86 participants are detailed below:

Risk of transmission:

The risk of transmission is estimated to be 0.3% [3per 1000](6,7). Nineteen doctors (56%) and 13 nurses (25%) were aware of the correct risk, 2 doctors (5.8%) and 15 nurses(28%) underestimated the risk while 13 (38%) doctors and 20 nurses(38%) overestimated the risk, their answers ranging from 10 %-100%.

Identification of high risk fluid:

Peritoneal, pleural, synovial and CSF are high risk fluids for transmission of HIV as compared to urine, saliva, vomitus and faeces[1]. None identified all the high risk fluids correctly. About 70% of doctors and 82% of nurses identified three (pleural fluid, synovial fluid, CSF) high risk fluid correctly, 15 doctors (44%) considered urine to be high risk fluid, 25 (48%) nurses considered saliva to be high risk fluid, 32 doctors (94%) and 52 nurses (100%) considered peritoneal fluid as low risk for HIV transmission.

Whom to contact first:

In Hospital, Sungai Petani , the Casuality Medical Officer has to be contacted in case of needle stick injury. Only 3 doctors and 17 nurses were aware of this fact while others were not.

First – aid procedure:

Thirty doctors(94%) and 51 nurses(98%) correctly stated that washing the site with soap and water was the first aid procedure to be followed. Among these 23(9 doctors+14 nurses) participants stated that squeezing of blood from the site of injury after washing site with soap and water. Six(3 doctors+3 nurses) respondents also stated that the wound should be dressed after washing.

When to initiate post-exposure prophylaxis:
Post-exposure prophylaxis should commence within 1 hour of a needle stick injury[1,5,8]. Twenty five doctors (73.5%) and 34 nurses (65%) stated that prophylaxis should be started immediately after injury, 4 doctors and 5 nurses stated that it should be started within 24 hours, 5 doctors and 3 nurses said it could be initiated after 10 days.

Drugs used for post-exposure prophylaxis:
As per CDC guidelines(1), post exposure prophylaxis consists of combination of 2 nucleoside analogue reverse transcriptase inhibitors (Zidovudine and Lamivudine). In case of a very high risk exposure, one protease inhibitor(Indinavir or Nelfinavir) is added to the combination of reverse transcriptase inhibitors. None of the respondents knew the exact drugs included in the schedule. Twenty three doctors (67%) and 41 nurses (78%) knew about zidovudine alone, 23 (11 doctors+12 nurses) participants had no idea of the drug used and 8 (5+3) knew that a second drug is used along with zidovudine.

Availability of drugs for pos- exposure prophylaxis:
Zidovudine, Lamivudine and Indinavir are available round the clock in the Hospital Pharmacy. Twenty three doctors (67%) and 35 nurses (67%) knew that they are available in the pharmacy, 16 (8+8) stated that they are available with the infection control unit, 8 (3+5) believed that the drugs were not available.

Duration of prophylaxis:
Post-exposure prophylaxis is administered for 28 days[1,8]. Only 6 doctors (17%) and 8 nurses (15%) were aware of the exact duration. Twelve (2 doctors +10 nurses) had no idea, 56 (25 doctors + 31 nurses) had overestimated it to be one and half to six months and 2 (1 doctor + 1 nurse) underestimated it to be one week.

Cost of post-exposure prophylaxis:
Presently, combination of Zidovudine and Lamivudine costs about RM 500 for complete post-exposure prophylaxis. If Indinavir is added to the above regimen, the cost will be RM 700. Only 11 doctors (32%) and 12 nurses (23%) knew the approximate cost of therapy, 10 doctors and 18 nurses had no idea, 7 doctors and 18 nurses overestimated and 6 doctors and 4 nurses underestimated it.

None of the respondents answered all the questions correctly. There was no significant difference between the responses of doctors and nurses. Table I shows the correct responses to each question asked.

Discussion

Literature survey reveals that the average risk of HIV transmission after a percutaneous exposure to HIV infected blood is approximately 0.3% and 0.09% after mucus membrane exposure[6,7]. The risk of transmission after skin exposure has not been quantified. The risk increases with exposure to a larger quantity of blood from the patient source as indicated by (i) deep injury (ii) a procedure that involved a needle placed directly in a vein or artery, or (iii) a device visibly contaminated with blood. The risk also increases with higher titres of HIV in the inoculum. In the present study, about 56% of doctors and 25% of nurses were able to identify the approximate risk of transmission. In addition to blood, CSF, synovial fluid, pleural fluid and peritoneal fluid which were included in our questionnaire, semen,

Table I: Percentage of respondents giving correct answer to each question

Question	Percentage of correct responses	
	Doctors	Nurses
Risk of transmission	56	25
Identification of high risk fluids	0	0
Whom to contact first	9	32
First-aid procedure	94	98
When to initiate post-exposure prophylaxis	73	65
Drugs used for post-exposure prophylaxis	6	78
Availability of drugs	67	67
Duration of post-exposure prophylaxis	17	15
Cost of post-exposure prophylaxis	32	23

vaginal secretions, amniotic fluid and pericardial fluids are also considered high risk fluids for HIV transmission. Nearly 44% of doctors wrongly considered urine and 48% of nurses wrongly considered saliva to be high risk fluid .

Majority of doctors (94%) and nurses (98%) correctly stated that washing the site with soap and water was the first aid procedure of choice. There are no reports that expressing blood by squeezing of wound or the use of antiseptic for wound care further reduces the risk of HIV transmission. Antiseptic or disinfectants are not contraindicated. It is reported that there is a brief period between exposure to HIV and development of systemic infection, during which the post-exposure prophylaxis may modify viral replication[1]. When a person is exposed to HIV, dendritic cells in the mucosa and skin are the initial targets. Infection of these cells occur at the site of inoculation during the first 24 hours following mucosal exposure to cell free virus. During the subsequent 24 – 48 hours, migration of these cells to the regional lymph nodes occur and the virus is detectable in the peripheral blood within 5 days. Post-exposure prophylaxis immediately after the exposure may prevent or inhibit systemic infection by limiting proliferation of the virus in the dendritic cells or lymph nodes. The maximum benefit is obtained by commencing prophylaxis within the first hour although it may be delayed to a maximum of 48 – 72 hours. Post-exposure prophylaxis initiated beyond 72 hours is less effective in preventing infection but may still control the progress of primary infection.

Regarding drugs for post-exposure prophylaxis, zidovudine (reverse transcriptase inhibitor) when given alone has been found to reduce the risk of transmission among HCW by approximately 81%[9]. It acts by suppressing viraemia, creating a drug facilitated vaccine type of response and by chemoprophylaxis[10]. A total of 11 cases of failure of zidovudine post-exposure prophylaxis for HIV has been reported among HCW around the world[11]. The probable reasons for failure may include a zidovudine resistant strain of HIV, a high titre and/or large inoculum, delayed initiation and/or short duration of post-exposure prophylaxis, possible factors related to the host (e.g. immune status) and/or to the source of patients virus (e.g. presence of syncitium forming strain).

Lamivudine (another reverse transcriptase inhibitor) is combined with zidovudine because the combination has greater antiretroviral activity against many zidovudine resistant strains without substantially increased toxicity[1]. The addition of protease inhibitor such as indinavir or nelfinavir following a "high risk" exposure inhibits viral replication at different stages in the replication cycle and thus improves the efficacy of post-exposure prophylaxis.

The recommended duration of post-exposure prophylaxis is 4 weeks[1]. In about 24% – 36% of those receiving post exposure prophylaxis the drugs needs to be discontinued because of their side effects. In a survey conducted by Duff et al[12] in United Kingdom, only 8 out of 26 surgeons knew the Department's Health guidelines on post-exposure prophylaxis. Thirteen surgeons knew the correct estimated risk of seroconversion after a needle stick injury from an HIV positive patient. In another study, Diprose et al surveyed 76 anesthetists working at Southampton General Hospital in UK [13]. Only 45.2% correctly identified the high risk body fluids. Sixty-eight percent of anesthetists knew the appropriate first aid measures and only 15% were aware that post exposure prophylaxis should be administered within 1 hour of injury. Siwach et al surveyed 123 residents of various surgical specialists at Post Graduate Institute of Medical Education and Research, Chandigarh [14] and found that 70% of respondents were not aware of the availability of post exposure prophylaxis, most of them were not sure of the timing of its administration. Chogle et al surveyed 39 anesthetists and 31 surgical residents working at Tara Memorial Centre, Mumbai [15]. They found out that no one knew exactly which drug to be used for post-exposure prophylaxis. Only 4 respondents (6%) knew the correct duration of prophylaxis. Thus it is clear from these studies and our study that HCWs are still ignorant about post-exposure prophylaxis in spite of the existing guidelines. Further, our survey was not designed to compare the clinical knowledge among various faculties or among various groups on the basis of experience. Our attempt was to assess the awareness of post-exposure prophylaxis and it revealed lacuna in education and training.

In spite of the guidelines from CONT, it is clear from our study that most respondents were not aware of its existence. As mentioned earlier, it is mandatory on the part of the HCWs to have sufficient knowledge about post-exposure prophylaxis. After this study was over, a copy of CDC guidelines on post-exposure prophylaxis and answers to the questionnaire based on them were distributed to all the doctors and nurses of

the hospital. Further it is suggested that Hospital Infection Control Committees must formulate, implement and monitor recommendations and impart frequent training and education to HCW. Confidentiality should be maintained regarding needle stick injuries and subsequent sero status. Ignorance of post-exposure prophylaxis increases the risk of acquiring HIV infection following occupational exposure. Hospital and medical institutions with large turn over of HCWs should undertake frequent training programmes for their staff and trainings on occupational health hazards, biosafety precautions and post -xposure prophylaxis.

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