Awareness of post-exposure prophylaxis guidelines against occupational exposure to HIV in a Mumbai hospital

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ABSTRACT

Background. Exposure to the human immunodeficiency virus (HIV) is a matter of concern for healthcare workers. We conducted a survey to determine the level of awareness amongst operating room personnel regarding post-exposure prophylaxis in case of needlestick injuries from confirmed or suspected cases of HIV.

Methods. A structured questionnaire was presented to 39 anaesthetists and 31 surgical residents. Questions were related to identification of high risk fluids, risk of transmission, drugs, costs and procedure to be adopted for post-exposure prophylaxis.

Results. Fourteen respondents (20%) were aware of the true risk of transmission. About one-third identified all high risk fluids correctly. Fifty-five respondents (78%) correctly stated that washing the site with soap and water was the initial measure, but less than a third knew whom to contact immediately after a needlestick injury. Though 45 respondents (64%) correctly stated that prophylaxis should be initiated within 1 hour of injury, none knew which drugs were to be used. Thirty respondents (42%) were aware of the use of zidovudine but none were aware of the second or third drugs used for post-exposure prophylaxis. Only 4 respondents (6%) knew the correct duration of post-exposure prophylaxis. Five respondents (7%) knew that the drugs were available in medical stores and 7 knew the approximate cost of therapy.

Conclusion. There is surprisingly poor knowledge of post-exposure prophylaxis against HIV. Ongoing awareness and training programmes are necessary to improve the same.


INTRODUCTION

Exposure to the human immunodeficiency virus (HIV) is a matter of concern for healthcare workers (HCW). In the USA, 52 confirmed cases of occupational transmission of HIV to HCW had been documented till 1997 by the Centers for Disease Control and Prevention (CDC). In India, the first confirmed case of HIV infection due to an accidental occupational exposure has been documented only recently. Seroprevalence rates of HIV in India vary widely depending on the geographic area and demographic characteristics, and range between 0.31% and 0.75% in the general population. In Mumbai, data collected using the sentinel surveillance methodology has documented an HIV infection rate exceeding 2% in women attending antenatal clinics for the year 2000 [National AIDS Control Organization (NACO) website: http://naco.nic.in/vsnaco/indiascene/update.htm]. Moreover, in a majority of patients the HIV infection status is not known at the time of initial presentation to the hospital. Anaesthesiists and surgeons perform invasive procedures and may experience percutaneous injuries despite following ‘universal precautions’. Guidelines have been formulated by CDC, Atlanta to prevent disease transmission to HCW. In India, NACO has formulated similar guidelines for post-exposure prophylaxis against HIV. A number of reviews in the literature have specifically highlighted the role of post-exposure prophylaxis for the prevention of HIV transmission.

The first knowledge, attitude and practice survey carried out in India, published in 1994, showed gross ignorance about AIDS among HCW. The study, however, focused on AIDS in general and awareness of post-exposure prophylaxis was not assessed. Since then, awareness regarding post-exposure prophylaxis in India has only been summarily reported. We conducted a survey amongst anaesthetists and surgeons working in the operating room premises, daycare centre and intensive care unit (ICU) of the Tata Memorial Centre, Mumbai, to gauge their awareness regarding the risk of transmission and post-exposure prophylaxis in case of accidental needlestick injury from a confirmed or suspected source of HIV.

METHODOLOGY

After obtaining individual written consent, a questionnaire was presented to 39 anaesthetists (including 9 consultants) and 31 surgical registrars on 21 August 2000. All the respondents had been working in the hospital for at least 6 months. The questionnaire (9 questions) was given to them individually in the operating room premises or the ICU. The questions asked were:

1. What percentage of needlestick 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 a needlestick injury?
4. What first-aid procedure should be performed at the needlestick site?
5. How soon after a needlestick 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?
In order to avoid a discussion or consultation among the respondents regarding the questions asked, the questionnaire was distributed to each of them and when answered, collected personally by 2 of the authors within 3 hours. The responses were sealed, collected and confidentiality maintained about the answers given which were analysed with the CDC guidelines (1998) as the reference standard.  

RESULTS

None of the respondents approached refused to answer the questionnaire. The answers given by the 70 respondents are detailed below.

Risk of transmission

The risk of transmission is estimated to be 3 per 1000 injuries (0.3%).  
13 14 Fourteen respondents (20%) were aware of the true risk (between 1:1000 and 9:1000), 13 (18%) underestimated the risk while the remaining 42 (60%) grossly overestimated the risk, their answers ranging from 50% to 90%.

Identification of high risk fluids

Pleural, peritoneal, synovial fluids and CSF are high risk fluids for transmitting HIV as compared to urine, saliva, faeces and vomitus.  
1 9 Twenty-four respondents (34%) identified all the 'high risk' fluids correctly, 35 (50%) wrongly considered saliva to be a high risk fluid, whereas an equal number considered synovial fluid as 'low risk' for transmission of HIV.

Whom to contact first

At our institute, the staff physician has to be contacted in case of a needlestick injury. Nineteen respondents (27%) were aware of this fact while 15 (21%) were not. Fourteen (20%) answered that the point of first contact was the microbiology department, the medical superintendent (6%) or the transfusion medicine department (6%). Other answers included the operating room in-charge and the head of the department.

First-aid procedure

Of all the respondents, 55 (78%) correctly stated that 'washing the site with soap and water' was the first-aid measure to be followed. Among these respondents, 24 also stated that actively bleeding the site should precede washing the site with soap and water. The remaining 15 (22%) stated that cleaning with bleach or dressing the wound with antiseptics such as povidone–iodine or chlorhexidine was the first-aid measure to be used.

When to initiate post-exposure prophylaxis

Post-exposure prophylaxis should commence within 1 hour of a needlestick injury.  
1 3 7 9 Of all the respondents, 45 (64%) correctly answered the question, 11 (16%) stated that it should be started within 24 hours, 7 (10%) said it could be initiated within weeks or months after a needlestick injury and 7 (10%) did not know.

Drugs used for post-exposure prophylaxis

According to the CDC guidelines, post-exposure prophylaxis consists of a 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. Earlier, NACO had suggested that zidovudine alone was sufficient for post-exposure prophylaxis in the Indian population. However, recent NACO guidelines 4 (available at www.naco.nic.in), recommend a combination therapy similar to the CDC guidelines for post-exposure prophylaxis.

None of the respondents knew the exact drugs included in the schedule. Thirty respondents (42%) knew about zidovudine alone, an equal number admitted that they had no idea of the drugs used, 4 knew that a second drug is used along with zidovudine but could not identify it and 6 believed that acyclovir, immunoglobulins and co-trimoxazole were used.

Availability of drugs for post-exposure prophylaxis

Zidovudine, lamivudine and indinavir are available with the staff physician during routine working hours, and with the resident medical registrar in the absence of the staff physician. The drugs are available round the clock in the majority of medical stores near our hospital. Five respondents (7%) believed that the drugs were not available, 44 (63%) did not know where they were available, 5 (7%) knew that they were available in medical stores and 16 (23%) stated that they were available at other places such as pharmaceutical companies, AIDS control organizations, etc.

Duration of post-exposure prophylaxis

Post-exposure prophylaxis is administered for 28 days.  
1 3 4 Only 4 respondents (6%) were aware of the exact duration, 42 (60%) had no idea, 7 (10%) underestimated it while 17 (24%) overestimated it.

Cost of post-exposure prophylaxis

Presently, depending on the manufacturer, the combination of zidovudine and lamivudine costs between Rs 1900 and Rs 5300 for a complete course of post-exposure prophylaxis. If indinavir is added to the above regimen, the cost is between Rs 9000 and Rs 13 000. Only 7 respondents (10%) had an approximate idea of the cost of the complete regimen, 52 (74%) had no idea, 4 (6%) underestimated it and 7 (10%) overestimated it.

None of the respondents answered all the questions correctly. The maximum number of correct answers was 6 (by 1 respondent only). There was no significant difference between the responses of anaesthetists and surgeons. Table I shows the percentage of correct responses to each question asked.

DISCUSSION

Based on prospective studies on HCW, it is estimated that the average risk of HIV transmission after a percutaneous exposure to HIV-infected blood is approximately 0.3% (95% CI: 0.2%–0.5%) and 0.09% (95% CI: 0.006%–0.5%) after a mucous membrane exposure.  
13 14 The risk of transmission after skin exposure has not been quantified. The risk increases with exposure to a larger quantity of blood from the source patient as indicated by (i) a device visibly contaminated with blood, (ii) a procedure that

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involved a needle placed directly in a vein or artery, or (iii) a deep injury. The risk also increases with higher titres of HIV in the inoculum. In our survey, only 20% of respondents were able to identify the approximate risk of transmission. In addition to blood, CSF and synovial, pleural and peritoneal fluids, which were included in our questionnaire, semen, vaginal secretions, amniotic and pericardial fluid are also considered high risk fluids for HIV transmission. However, we did not include these because operating room personnel in our institute are not routinely exposed to these fluids. Nearly half the respondents wrongly considered blood-free saliva as a high risk fluid. This could be attributed to the fact that saliva often becomes blood stained during airway management and intraoral operative procedures.

Most respondents (78%) correctly stated that washing the site with soap and water was the first-aid procedure of choice. There is no evidence to suggest that the use of antiseptics for wound care or expressing fluid by squeezing the wound further reduces the risk of HIV transmission. The use of antiseptics or disinfectants is not contraindicated. However, application of bleach and injection of antiseptics or disinfectants into the wound is not recommended.

Information about primary HIV infection indicates that systemic infection does not occur immediately, leaving a brief ‘window of opportunity’ during which post-exposure prophylaxis may modify viral replication. When a person is exposed to HIV, dendritic cells in the mucosa and skin are the initial targets. Infection of these cells occurs 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 regional lymph nodes occurs and the virus is detectable in the peripheral blood within 5 days. Initiation of prophylaxis soon after 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 the primary infection.

Zidovudine, a nucleoside analogue reverse transcriptase inhibitor, when given alone has been found to reduce the risk of transmission among HCW by approximately 81% (95% CI: 43%–94%). The drug acts by suppressing viraemia, creating a drug-resistant strain of HIV. This could be attributed to the fact that saliva often becomes blood stained during airway management and intraoral operative procedures.

The recommended duration of post-exposure prophylaxis is 4 weeks (28 days). Preliminary information from HCW receiving post-exposure prophylaxis has shown that side-effects of the drugs lead to discontinuation of therapy by 24%–36% of recipients.

Similar surveys have been performed in the UK. Duff et al. surveyed 26 surgeons in 13 hospitals in Bristol. Only 8 surgeons knew the Department of Health’s guidelines on post-exposure prophylaxis. The time within which prophylaxis should be started was correctly stated by 10 surgeons but only 2 surgeons knew where to obtain post-exposure prophylaxis out of hours. Thirteen surgeons knew the correct estimated risk of seroconversion after a needlestick injury from an HIV-positive patient. Diprose et al. surveyed 76 anaesthetists working at Southampton General Hospital in the UK. Only 45.2% correctly identified the high risk body fluids. Sixty-eight per cent of anaesthetists 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 specialties at the Post Graduate Institute of Medical Education and Research, Chandigarh and found that 70% of the respondents were not aware of the availability of post-exposure prophylaxis, and most of them were not sure of the timing of its administration.

Our survey and those of Duff et al. and Diprose et al. show that most surgeons and anaesthetists are still ignorant about post-exposure prophylaxis, in spite of the clear existing guidelines.

A limitation of our survey was that we included only anaesthetists and surgeons from our institute and not nursing staff, laboratory technicians, operating room assistants, etc. who are exposed to the same occupational hazards. It is difficult to extrapolate our results to all HCW and to anaesthetists and surgeons of other institutes. Our survey was not designed to compare clinical knowledge among various faculties or among groups on the basis of experience. Our attempt was to assess the awareness of post-exposure prophylaxis and it revealed a serious lacuna in education and training.

Our institute has established a protocol for reporting, counseling and treating of needlestick injuries. Our survey suggests that most respondents were ignorant of its existence, and that knowledge of the protocol needs to be disseminated more widely and effectively. After gauging the level of ignorance in our survey, a copy of the CDC guidelines on post-exposure prophylaxis and the answers to the questionnaire based on them were distributed to all operating room personnel.

Healthcare employers should establish exposure control protocols for reporting, registration, evaluation, counselling, treatment and follow up of occupational exposure to pathogens including HIV. Hospital infection control committees must formulate, implement and monitor recommendations, and impart frequent training and education to HCW. Access to clinicians who can provide post-exposure care should be available at all times. Confidentiality should be maintained regarding needlestick injuries and the subsequent serostatus. All instances of occupational exposure must be notified to regional AIDS control centres. This does not detract from the fact that the responsibility of knowing about the protocols of post-exposure prophylaxis rests with the HCW. Ignorance of post-exposure prophylaxis increases the risk of acquiring HIV infection following occupational exposure. Teaching institutes and medical centres with a large turnover of trainee HCW should undertake frequent training programmes for their staff and trainees on occupational health hazards, biosafety precautions and post-exposure prophylaxis.
Parasitic diarrhoea in patients with AIDS

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ABSTRACT

Background. Diarrhoea is a common clinical manifestation of HIV infection regardless of whether or not patients have AIDS. Two newly recognized opportunistic coccidial protozoa are parasitic pathogens in AIDS patients. We attempted to determine the common parasites in Indian patients with AIDS.

Methods. Between October 1994 and December 1996, a total of 110 stool specimens from 94 AIDS patients with acute or chronic diarrhoea were examined by microscopy of wet mounts and smears stained by a modified Ziehl–Neelsen’s (cold) staining method.

Results. Isospora belli was the most frequently encountered parasite in 17% of patients, followed by Entamoeba histolytica in 14.9% and Cryptosporidium in 8.5%. Strongyloides stercoralis and Giardia lamblia were detected in 5.3% and 4.3% of patients, respectively.

Conclusion. The presence of different parasites in 56.4% of stool specimens of patients with AIDS indicates that their specific diagnosis is essential. This will help initiate therapy to reduce the morbidity and mortality among such patients due to these pathogens.

INTRODUCTION

Although gastrointestinal diseases occur in all groups of immunocompromised patients, they occur with the greatest frequency (up to 90% of patients in developing countries) in patients with AIDS.1 Diarrhoea is a common clinical manifestation of patients with HIV infection regardless of whether or not they have AIDS.2 In the immunocompetent host, Cryptosporidium and Isospora cause acute enteritis which resolves spontaneously within 10–14 days. As an exception, cyclosporal diarrhoea can be prolonged (often 4 weeks) but self-limiting. However, in immunocompromised patients, diarrhoea due to coccidial species may be severe, prolonged, debilitating and can become life-threatening.3,4 Small bowel infection generally produces bloating, nausea, abdominal cramps, weight loss and profuse diarrhoea, which may be watery and voluminous.5 Infection with the nematode Strongyloides is potentially lethal because of its ability to cause an overwhelming auto-infection, particularly in immunocompromised patients.6 Disseminated strongyloidiasis occurs in a variety of clinical settings of immunosuppression.7

PATIENTS AND METHODS

A total of 94 AIDS patients with diarrhoea who were attending the outpatient department or were admitted to the Sir J.J. Group of Hospitals, Mumbai were studied between October 1994 and December 1996. HIV seropositivity of the patients was confirmed by testing for HIV antibodies by DETECT-HIV (Biochem Immunosystems Inc., Montreal) and HIV-SPOT (Genelabs Diagnostics, Singapore).

AIDS patients with a history of 3–4 loose motions a day or more