

Management of occupational exposure to HIV – what actually happens

RU Sidwell, JSA Green, V Novelli

Summary: *A year after the Department of Health issued guidelines on post exposure prophylaxis (PEP) for health care workers exposed to HIV, we conducted a telephone survey of occupational health nurses and junior doctors in London teaching hospitals, to assess implementation of the guidelines and awareness among junior doctors of local policies. The management and administration of PEP for HIV differed considerably between hospitals. Many junior doctors did not know what to do in the event of a needlestick injury. Both the implementation of and the briefing of staff about current management policies need to improve.*

Key words:
disease transmission,
patient to professional
guidelines
occupational exposure
organisation and
administration
preventive health services

Commun Dis Public Health 1999; 2: 287-90

Introduction

Occupationally acquired HIV infection has been documented in 95 health care workers (HCW) following definite exposure, and in a further 191 cases following probable exposure¹.

The risk of contracting HIV from percutaneous exposure to the virus is estimated to be 3 in 1000^{2,3}, but post exposure prophylaxis (PEP) can reduce the rate of occupational transmission significantly. PEP with zidovudine alone reduces the risk of seroconversion for HIV by 80%, and triple therapy is believed to reduce the rate further^{3,4}. In June 1997 the Department of Health issued official guidelines on PEP for health care workers occupationally exposed to HIV (box)⁵.

The aim of this project was to determine, one year after publication of the guidelines, how the guidelines were being implemented. We surveyed London teaching hospitals, which serve a population with a relatively high prevalence of patients with HIV infection and where, as a result, we would expect implementation to be the most advanced.

Methods

Teaching hospitals in Greater London were surveyed in June 1998, over a period of three weeks. Occupational health nurses were contacted by telephone and asked to respond to a standard

RU Sidwell, V Novelli
Hospital for Sick Children, Great Ormond Street, London

JSA Green
Royal Free Hospital, London

Address for correspondence:
Dr Rachel Sidwell
Department of Dermatology
Hospital for Sick Children
Great Ormond Street
London WC1N 3JH
tel: 0207 405 9200
fax: 0207 813 8274

BOX

The Department of Health guidelines⁵

The current guidelines recommend that PEP is considered whenever there has been exposure to blood or other high risk body fluids known to be contaminated with HIV, or strongly suspected to be so.

Three types of injury are recognized as being of high risk: percutaneous injury, exposure of broken skin, exposure of mucous membranes (including the eyes).

The highest risk is from blood or blood-stained body fluids, but other high risk body fluids are defined as: cerebrospinal fluid, peritoneal fluid, synovial fluid, pericardial fluid, pleural fluid, unfixed organs and tissues, semen, vaginal secretions, amniotic fluid, breast milk, and saliva in association with dentistry.

The guidelines state that a suspicion of contamination should be obtained by reviewing clinical details of the source patient (history, examination, and pathology results). If the injury is thought to carry a high risk for HIV transmission, the patient's consent should be sought and, if obtained, blood should be taken from the source patient for HIV testing. In a situation carrying a high risk, PEP should be started immediately, preferably within *one hour*, and not delayed for blood test results (although starting PEP up to two weeks after exposure may still be beneficial.)

The current recommended prophylaxis: zidovudine 200mg three times daily or 250mg twice daily, lamivudine 150mg twice daily, and indinavir 800mg three times daily for four weeks. The regimen may be altered in the light of knowledge about the particular HIV strain involved, drug allergies, whether the health care worker is pregnant, and the likelihood of interaction with other prescribed drugs.

Starter packs containing at least three days' supplies (to cover a bank holiday weekend) should be readily available at all times.

There should be some arrangement for follow up visits, during which confidentiality should be maintained. Prophylaxis may be started immediately if the risk is considered to be high and fuller discussion and risk assessment made later. At least six months should have elapsed after completing PEP before the health care worker can be reassured that he/she has not become infected.

TABLE 1 People with whom the case is discussed (answers are not mutually exclusive)

	Daytime (people with whom occupational health nurse discussed case)		Out of hours (first point of contact)	
	Number	(%)	Number	(%)
A&E SHO* same hospital	–	(–)	17	(48)
Virology consultant	14	(40)	5	(14)
OH consultant	10	(29)	2	(6)
Genitourinary consultant/clinic	5	(14)	–	(–)
Infectious diseases consultant/clinic	4	(11)	–	(–)
Microbiology consultant	3	(9)	6	(17)
HIV team	3	(9)	–	(–)
Wait for HIV test result on donor	5	(14)	2	(6)
A&E SHO another hospital	–	(–)	2	(6)
Infectious diseases SHO	–	(–)	2	(6)
Medical SHO	–	(–)	1	(3)

* senior house officer

questionnaire about local practice. One junior doctor (house officer, senior house officer, or specialist registrar, as an example of a health care worker at high risk of percutaneous injury) was then paged in each of the hospitals and asked who he/she would contact in the event of a needlestick injury, both during the day and out of hours.

Results

Thirty-six teaching hospitals in Greater London were approached, and 35 responses were obtained. Thirty-four hospitals had written protocols for the management of needlestick injuries, but only nine protocols offered specific examples of patients who would be considered a high risk for HIV infection.

During the day occupational health nurses made the initial assessment of injuries in 34 hospitals, but eight of these nurses were located in another hospital, requiring the injured doctor to travel to obtain initial advice. If there was concern that the injury could carry a risk of HIV transmission, the case was usually discussed with a designated specialist (table 1), but in five instances, a decision on prophylaxis was not made until the result of an HIV test on the source patient was obtained. The injured junior doctor reviewed the case notes him/herself in 25 hospitals; the source patient's own team did so in the remaining ten.

TABLE 2 Starter packs

Antiretroviral combination	Number
zidovudine, lamivudine, indinavir	21
stavudine, lamivudine, nevirapine	3
zidovudine, lamivudine	3
zidovudine, lamivudine, indinavir, metoclopramide	1
Not known	7

Out of hours injuries were initially assessed by various people, depending on the hospital (table 1). If the assessment was made by a senior house officer and thought to be of high risk, it was always discussed with a designated consultant or registrar in a relevant specialty: microbiology in seven hospitals, infectious diseases in five, HIV in four, virology in four, genitourinary medicine (GUM) in three, and accident and emergency in one.

In 13 hospitals the junior doctor injured was required to contact a consultant directly by telephone for initial assessment. In seven hospitals, if PEP was judged necessary, the junior doctor had to travel to another hospital to obtain the drugs. In two the injured doctor had to travel to an accident and emergency department in another hospital for initial assessment. In two hospitals the results of an HIV test were awaited before PEP was started. In 34 out of 35 hospitals injured doctors would review the source patient's notes themselves.

In 26 out of 34 hospitals the source patient was tested for HIV and received counselling by the senior house officer caring for the patient. The HIV or GUM team were involved in six hospitals, the phlebotomist in one hospital, and two policies required the patient to attend another hospital.

PEP starter packs contained various drug combinations (table 2), and the packs were kept in several locations around the hospital (tables 3). The packs contained enough for at least three days in 18 hospitals, and for two days or less in eight cases (in nine hospitals the occupational health nurse asked did not know).

Eighteen occupational health nurses said that the drugs should ideally be started within an hour of exposure and 12 said as soon as possible. When asked how long after exposure they would consider giving PEP, three said only within 72 hours, five within a week, five within two weeks, and 22 did not know but said that they would discuss the case with their consultant.

The blood test on the injured doctor, to be stored pending possible later testing for HIV, was to be performed either by a senior house officer in the accident and emergency department (21/35) or the occupational health nurse (20/35) in most hospitals.

TABLE 3 Location of starter packs (answers are not mutually exclusive)

Location	Number	(%)
A&E department	17	(49)
Occupational health	10	(29)
Different hospital (full starter course)	9	(26)
Pharmacy	5	(14)
Infectious diseases/HIV ward	4	(11)
Theatres	3	(9)
GUM clinic	2	(6)
Medical ward	1	(3)
Indinavir only kept in pharmacy	2	(6)
First dose only in same hospital	3	(9)
Not known	4	(11)

Injured doctors were counselled by the occupational health nurse initially in ten hospitals. Further or initial counselling was provided by the infectious disease consultant (in ten hospitals), the occupational health consultant (eight), the GUM clinic (seven), or the consultant microbiologist (three). In two hospitals the injured doctor was advised to go to the nearest accident and emergency department for counselling.

The final part of the survey, in which junior doctors were asked if they knew who to contact, showed that most doctors did not know what the policy was, particularly for injuries at night (table 4).

Discussion

The Department of Health's guidelines for PEP had been in place for a year when this survey was carried out, arguably allowing adequate time for implementation. This study, which concentrated on injuries to doctors rather than other (or all) health care workers, revealed a considerable variation between hospital policies and their implementation.

The major viral hazards of needlestick injury are hepatitis B, hepatitis C, and HIV infection. There is an estimated transmission risk of 1 in 3 for an unvaccinated individual from a percutaneous exposure to a hepatitis B e antigen positive individual⁷, compared with around 1 in 30 for an equivalent exposure to hepatitis C virus⁸, and around 1 in 300 for percutaneous exposure to HIV infected blood^{2,3}. All doctors should be immunised against hepatitis B, however, and in the event of an injury further vaccine with or without immunoglobulin is given as routine practice. No acute remedy is available for Hepatitis C. PEP for HIV infection is relatively new and the Department of Health guidelines emphasise that it should be given promptly, which requires well-structured and implemented protocols⁵.

Survey findings

Almost all hospitals surveyed had written protocols for management of needlestick injuries carrying a high risk of HIV transmission, but a minority contained examples of patients who would be considered high risk for HIV. The occupational health nurses said they found such lists useful, which suggests that they should be provided in protocols.

During the daytime the person making the initial assessment of risk (usually the occupational health nurse) should have received specific training. If there was any concern about or knowledge of high risk of HIV, cases were discussed with a registrar or consultant in a relevant specialty before PEP was given, as is recommended. A surprisingly large number of policies required the injured doctor to go to another hospital – something that is not always easy to arrange. The task of reviewing case notes to assess the risk of infectivity was often undertaken by the injured doctor (particularly out of hours). Although doctors may wish to examine the evidence themselves, perhaps this should be reviewed. In addition, awaiting the result of the source patient's HIV test

TABLE 4 Junior doctors' responses when asked who they would contact about a needlestick injury

	Daytime	Out of hours
	Number (%)	Number (%)
Know who to contact	19 (54)	7 (20)
Do not know who to contact	16 (46)	28 (80)
'Guess' correctly	9 (56)	11 (39)
'Guess' incorrectly or unable to guess	7 (44)	17 (61)

before giving PEP, as was sometimes the case, is not what the guidelines recommend, and could cause unnecessary delay, particularly if exposures occur out of hours.

Policies on the management of needlestick injuries out of hours varied widely between hospitals on who to contact and whether contact should be direct (on the scene or at another hospital) or by telephone. Individual hospitals therefore need to publicise their own procedures. Where senior house officers made the initial assessment the outcome was always discussed with a senior doctor if PEP was considered. Adequate training of these senior house officers is important so that they know which injuries to discuss. Travelling to another hospital while on-call is impractical, and may prevent doctors from seeking advice. If starter packs were stored in all hospitals there would be no need to travel purely to obtain the drugs, as was the situation in seven hospitals out of hours.

Starter packs consisted of four different drug combinations, one of which contained an anti-emetic. All of these were subject to discussion with the appropriate consultant and could be varied if necessary. Many of the occupational health nurses interviewed did not know what the drugs were and could not find out from the protocol; this could easily be improved. Most starter packs contained enough for three to five days, but some had enough for only two days (not enough for a bank holiday weekend). Most occupational health nurses asked said that the PEP was to be given within one hour ideally, but few felt that this target was realistic. The process can be speeded up by leaving such things as incident forms to be filled in later, after treatment has begun. Most occupational health nurses did not know that PEP is sometimes thought to be beneficial given up to two weeks after the initial injury, but they all said they would discuss the matter with a consultant if they were unsure. A few believed that there was no point discussing the matter more than three days after injury and thus would not have advised prophylaxis when it could still be of value.

Counselling for the doctor appeared to be well organised, with various consultants being involved if necessary, but a hospital policy requiring a doctor to go to the 'nearest accident and emergency department' for counselling would not be a reassuring prospect for someone concerned that they may be at risk of contracting HIV infection.

The last part of the survey, in which a junior doctor

was contacted in each of the hospitals, revealed that during the daytime just over a half of doctors knew who to contact. Out of hours a minority of the doctors knew who to contact. Thus most doctors on call would have difficulty in setting the process of assessment and any necessary treatment in motion.

Conclusions

This study reveals considerable room for improvement in the management and administration of PEP for HIV. Better access to information about current guidelines and who to contact is needed. Occupational health nurses and senior house officers need further training. In the authors' opinion, more emphasis should be placed on providing thorough assessment, quick action when necessary, and confidentiality.

Every trust has a responsibility to formulate an up to date PEP policy, provide trained staff to implement it, and inform all employees how to obtain advice and any necessary treatment during the day and out of hours. Many trusts need to improve their current policies in order to offer the best service possible to their staff.

References

1. PHLS AIDS and STD Centre at the Communicable Disease Surveillance Centre and Collaborators. *Occupational transmission of HIV - summary of published reports*. December 1997. (<http://www.phls.co.uk/cdsc>)
2. Cardo DM, Culver DH, Ciesielski CA, Srivastava PU, Marcus R, Abiteboul D, et al. Case-control study of HIV seroconversion in health care workers after percutaneous exposure. *N Engl J Med* 1997; **337**: 1485-90.
3. Henderson DK, Fahey BJ, Willy M, Schmitt JM, Carey K, Koziol DE, et al. Risk for occupational transmission of human immunodeficiency virus type 1 (HIV-1) associated with clinical exposures. *Ann Intern Med* 1990; **113**: 740-6.
4. CDC. Provisional public health service recommendations for chemoprophylaxis after occupational exposure to HIV. *MMWR Morb Mortal Wkly Rep* 1996; **45**: 468-72.
5. Department of Health. *Guidelines on post-exposure prophylaxis for health care workers occupationally exposed to HIV*. London: Department of Health, 1997.
6. CDC. Case-control study of HIV seroconversion in health care workers after percutaneous exposure to HIV-infected blood - France, United Kingdom, United States, January 1988-August 1994. *MMWR Morb Mortal Wkly Rep* 1995; **44**: 929-33.
7. Gerberding J. Management of occupational exposure to blood-borne viruses. *N Engl J Med* 1995; **332**: 444-51.
8. Puro V, et al. Update on occupational HCV incidence studies: literature review. In: *Proceedings of an international colloquium on bloodborne infections, Paris, June 1995*. Hamburg: International Social Security Association, 1995: 374-6.

Appendix Questionnaire

1. Protocols
 - a. Does a protocol exist?
 - b. Are specific examples of patients who would be considered at high risk for HIV included?
2. Daytime assessment
 - a. Who is the initial point of contact and makes the initial assessment of risk?
 - b. With whom is the case discussed if there is concern or knowledge that the patient is high risk for HIV?
 - c. Is the result of an HIV test awaited prior to commencing PEP?
 - d. Who looks through the notes of the patient?
3. Out of hours assessment
 - a. Who is the initial point of contact and makes the initial assessment of risk?
 - b. If the assessment is made by an SHO with whom is it discussed?
 - c. Is the result of an HIV test awaited prior to commencing PEP?
 - d. If the assessment is made by a consultant, where is any necessary further treatment carried out?
 - e. Who looks through the notes of the patient?
4. Source patient
 - a. Who does the counselling and takes blood for HIV test?
5. Post exposure prophylaxis drugs
 - a. Which drug combination is used?
 - b. Where are the drugs kept?
 - c. How many days worth of drugs in the starter pack?
 - d. How quickly should PEP be given?
 - e. How late post-exposure should PEP be considered?
6. Recipient doctor
 - a. Who takes the blood for storage?
 - b. Who does any necessary further counselling for the doctor?