Risk assessment of HIV transmission in health care settings

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24 April 2012
The incident

A health care worker committed Suicide and was firmed to be HIV positive in January 2012
Some ripples
Ripple 1: cover up?
Ripple 2: risk of transmission
Ripple 3: Should we look back for possible cases
Ripple 4: should HIV HCW report their illnesses, balance between confidentiality & privacy

Call for doctors to declare HIV status exaggerates risk of disease transmission
Ripple 5: discrimination vs HIV patients
Issues for discussion

• HIV situation in HK
• Transmission risk from Health care worker to patients
• Exposure prone procedures (EPP)
• Overseas experience
• Duties of HCW
## Situation of HIV in Hong Kong

<table>
<thead>
<tr>
<th></th>
<th>This Quarter (Oct to Dec 2011)</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HIV</td>
<td>AIDS</td>
</tr>
<tr>
<td><strong>1. Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>96</td>
<td>23</td>
</tr>
<tr>
<td>Female</td>
<td>25</td>
<td>3</td>
</tr>
<tr>
<td><strong>2. Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chinese</td>
<td>76</td>
<td>20</td>
</tr>
<tr>
<td>Non-Chinese</td>
<td>45</td>
<td>6</td>
</tr>
<tr>
<td><strong>3. Route of Transmission</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterosexual contacts</td>
<td>27</td>
<td>8</td>
</tr>
<tr>
<td>Homosexual contacts</td>
<td>51</td>
<td>11</td>
</tr>
<tr>
<td>Bisexual contacts</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Injecting drug use</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Blood / blood product recipients</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Perinatal</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Undetermined</td>
<td>35</td>
<td>4</td>
</tr>
<tr>
<td><strong>4. Total</strong></td>
<td><strong>121</strong></td>
<td><strong>26</strong></td>
</tr>
</tbody>
</table>

*CHP data 2012*
Annual HIV/AIDS Statistics
香港每年愛滋病病毒感染及愛滋病統計
1984 – 2011, Hong Kong (N=5270/1267)

Data from ITC
Possible HIV HCW in HA

- HK population by 2011: 7.07 M
- HIV population by 2011: 5270
- Prevalence: **0.07%**
- No of HA staff by 2010: 57,713
- Possible HIV infected staff: $57,713 \times 0.07\% = \textbf{43} \text{ HCWs}$
What is the risk of transmission
For needle stick injury

• Risk of transmission from patients to HCW:
  – Hepatitis B: 30%
  – Hepatitis C: 3%
  – HIV: 0.3%
  – Many documented reports

• Mechanism is different from that of transmission from HCW to patients
Whenever needle stick injury occurs, the patient care procedure will usually be stopped. In general, the volume of pathogen will be low. The risk of transmission is relatively low.

However, what would be the risk?
Exposure prone procedures (UK)

• Invasive procedures where there is a risk that injury to the worker may result in the exposure of the patient’s open tissues to the blood of the worker (bleed-back).

• These include procedures where the worker’s gloved hands may be in contact with sharp instruments, needle tips or sharp tissues (eg spicules of bone or teeth) inside a patient’s open body cavity, wound or confined anatomical space where the hands or fingertips may not be completely visible at all times.
Exposure prone procedures

• UK
  – Category 1:
    • Hands and fingertips of the worker are usually visible and outside the body most of the time
    • Local anaesthetic injection in dentistry, removal of haemorrhoids
  – Category 2:
    • Fingertips may not be visible at all times but injury to the worker’s gloved hands from sharp instruments and/or tissues is unlikely
    • Routine tooth extraction, appendicectomy
  – Category 3:
    • Fingertips are out of sight for a significant part of the procedure, there is a distinct risk of injury to the worker’s gloved hands from sharp instruments and/or tissues
    • Hysterectomy, caesarean section, open cardiac surgical procedures

• US
  – Category 1:
    • Minimal risk
    • Routine rectal or vaginal examination, Minor surface suturing
  – Category 2:
    • Theoretically risk but unlikely
    • Locally anesthetized operative, prosthetic, and endodontic dental procedures, Subcutaneous pacemaker implantation
  – Category 3:
    • Definite risk or that have been classified previously as “exposure-prone”
    • Nephrectomy, small bowel resection, cholecystectomy, Cardiothoracic OT, Obstetrical/gynecological OT

Reported cases of transmission from HCW to patients around the world
Possible Transmission of Human Immunodeficiency Virus to a Patient during an Invasive Dental Procedure

Epidemiologic Notes and Reports Update: Transmission of HIV Infection during an Invasive Dental Procedure -- Florida

Transmission of HIV from infected health-care workers to patients

Carol A. Ciesielski*, David M. Bell† and Donald W. Marianos‡

AIDS 1991, 5 (suppl 2):593–597

Keywords: HIV transmission, health-care worker, HIV nosocomial transmission.

Introduction

Since the publication of the first report of possible transmission of HIV to a patient during an invasive dental procedure [1], and the two subsequent reports that strongly suggested that four additional patients were infected with HIV during the course of their dental care [2,3], widespread debate has ensued among the public health, medical, and dental communties; federal and state legislatures; the media; and the public about whether HIV-infected health-care workers should perform invasive medical and dental procedures. Available for 80%, 67% (31%) were reported to be health-care workers. Of these, 728 were physicians, 46 were surgeons, and 190 were dental workers (dentist and allied professionals). Seventy percent of these physicians, surgeons, and dental workers were reported to have had four. Of those in the three occupations mentioned above, who represent the entire health-care workers most likely to perform invasive procedures, 94% reported non-occupational risk for HIV infection. Most of the remaining 6% are still being followed-up by health departments to determine the mode of exposure to HIV. Based on experience gained in investiga-

Second case of doctor-to-patient HIV transmission

In March, Spanish health authorities reported what is believed to be the second world case of doctor-to-patient HIV transmission. The case involves a gynaecologist who passed on HIV to a woman during a caesarean section. The Official Medical College of Barcelona (COMB) announced the case on March 18 after it was leaked to the press that another woman assisted by the same gynaecologist had been recalled for an HIV test. The identity has not been disclosed, was unaware of his HIV status and had been a practising gynaecologist since 1998.

Once the case was notified, 275 women who had been assisted by the same obstetrician were recalled. Joan Guix, manager at the Agency of Public Health of Barcelona, said that, of the 250 women tested so far, none had an HIV infection. Guix noted that the recall process was “very delicate” and that the development of the COMB code of ethics “recommends its doctors avoid procedures involving infectious diseases transmission risk” but have no obligation to fulfill such recommendation.

It is not the first time that doctor-to-patient HIV transmission has been reported. According to the US Centers for Disease Control and Prevention, investigation of the patients of David Acer, a Florida dentist with AIDS, patient-to-patient transmission of HIV...
## Documented cases

<table>
<thead>
<tr>
<th>Countries</th>
<th>Source</th>
<th>Patients involved</th>
<th>Lookback</th>
<th>Phylogenetic analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>US, Florida</td>
<td>Dentist</td>
<td>• 6 patients infected between 1987-1989&lt;br&gt;• Mechanism not identified</td>
<td>1100 tested</td>
<td>Highly similar</td>
</tr>
<tr>
<td>France</td>
<td>Orthopaedic surgeon (CD4: 46 cells/ml)</td>
<td>• 1 patient infected in 1992&lt;br&gt;• During hip OT</td>
<td>983 tested</td>
<td>Closely related</td>
</tr>
<tr>
<td>France</td>
<td>Nurse (advanced HIV HCV coinfected)</td>
<td>• 1 patients infected in 1996&lt;br&gt;• Mechanism not identified</td>
<td>2294 tested</td>
<td>Strongly supported</td>
</tr>
<tr>
<td>Spain</td>
<td>Gynaecologist</td>
<td>• 1 patients infected in 2001&lt;br&gt;• During caesarean section</td>
<td>250 tested</td>
<td>Highly similar</td>
</tr>
</tbody>
</table>
The risk (UK)

- > 30 patient notification exercises & ~ 10,000 patients have been tested, **no transmission**.
- Current risk for the **most invasive type of EPP** by any HCW is estimated to be between **1 in 1,672,000** and **1 in 4,680,000**.
- **110** HCW are HIV +ve in UK
- If they performed EPPs, the risk of transmission would be increased to between **1 in 1,671,000** and **1 in 4,076,000**, or one additional HIV transmission **every 40 to 2,500 years**.
- If undiagnosed HCWs come forward for Dx & Rx, it will offset this additional risk partially or completely
The risk

Table 5: Reported numbers of patients tested for HIV after undergoing a higher risk (category 3 EPP) procedure by an HIV-infected HCW: UK and international data

<table>
<thead>
<tr>
<th></th>
<th>Number of incidents/studies</th>
<th>Number of category 3 EPP patients tested</th>
<th>Number patients positive</th>
<th>Plausible risk of transmission (a 3 in 4 chance the risk is less than this value and a 1 in 4 chance the risk is greater than this value)</th>
<th>Upper 95% confidence intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK lookbacks¹</td>
<td>15</td>
<td>2283</td>
<td>0</td>
<td>1 in 1600</td>
<td>1 in 620</td>
</tr>
<tr>
<td>US lookbacks²</td>
<td>5</td>
<td>1876</td>
<td>0</td>
<td>1 in 1400</td>
<td>1 in 510</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>4159</td>
<td>0</td>
<td>1 in 3000</td>
<td>1 in 1120</td>
</tr>
</tbody>
</table>

Table 6: Possible number of transmissions (with and without effective cART) if HIV-infected HCWs undertaking category 3 EPPs were allowed to resume work.

<table>
<thead>
<tr>
<th></th>
<th>Level of risk used in calculation</th>
<th>Risk estimate expressed as 1 per xxxx</th>
<th>Estimated number of transmissions per year if HIV-infected surgeons referred to UKAP between 2004-2009 were allowed to perform category 3 EPPs³</th>
<th>Possible transmission risk estimate based on a 20-fold reduction with cART⁴⁵</th>
<th>Estimated number of transmissions if HIV-infected surgeons referred to UKAP between 2004-2009 were allowed EPP3 practice and were taking effective cART</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK lookback estimate</td>
<td>Plausible risk of transmission</td>
<td>1 in 1600</td>
<td>1.6 per year</td>
<td>1 in 32,780</td>
<td>1 every 12 years</td>
</tr>
<tr>
<td>Total lookback estimate (UK + US lookbacks)</td>
<td>Plausible risk of transmission</td>
<td>1 in 3000</td>
<td>0.9 per year</td>
<td>1 in 60,000</td>
<td>1 every 22 years</td>
</tr>
<tr>
<td>Bell risk estimate⁶</td>
<td>Mean</td>
<td>1 in 42,000</td>
<td>0.07 per year</td>
<td>1 in 833,320</td>
<td>1 every 303 years</td>
</tr>
</tbody>
</table>

Risk of transmission in the era of Highly active anti-retroviral therapy (HAART)

- No data for transmission from HCW to patients
- May be extrapolated from **vertical transmission**
- In UK, vertical transmission of HIV
  - No intervention (Caesarean section or HAART): 20%
  - On HAART: 0.8%
  - On HAART and achieved viral suppression: 0.1%
  - Therefore risk decreases by **200 folds** with HAART
Management in other countries

Restricted to perform EPP:
• UK & Ireland
• Italy & Malta
• Australia

Management on case-by-case basis:
• Canada
• Austria & Belgium
• Finland & Sweden
• New Zealand
• France

US: (since 2010)
• Not restricted to perform category 1 & 2 procedures
• Allow to perform category 3 only if the HIV viral load <500 cpm
Recommendations for Preventing Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Patients During Exposure-Prone Invasive Procedures

This document has been developed by the Centers for Disease Control (CDC) to update recommendations for prevention of transmission of human immunodeficiency virus (HIV) and hepatitis B virus (HBV) in the health-care setting. Current data suggest that the risk for such transmission from a health-care worker (HCW) to a patient during an invasive procedure is small; a precise assessment of the risk is not yet available. This document contains recommendations to provide guidance for prevention of HIV and HBV transmission during those invasive procedures that are considered exposure-prone. INTRODUCTION

Recommendations have been made by the Centers for Disease Control (CDC) for the prevention of transmission of the human immunodeficiency virus (HIV) and the hepatitis B virus (HBV) in health-care settings (1-6). These recommendations emphasize adherence to universal precautions that require that blood and other specified body fluids of all patients be handled as if they contain blood-borne pathogens (1,2).
• All HCWs should adhere to **universal precautions**
• HCWs who perform EPP should know their HIV antibody status.
• HCWs who are infected with HIV or HBV (and are HBeAg positive) **should not perform EPP** unless they have sought counsel from an **expert review panel** and been advised under what circumstances, if any, they may continue to perform these procedures.
• Such circumstances would include **notifying prospective patients** of the HCW's seropositivity before they undergo EPP.
• Mandatory testing of HCWs for HIV is not recommended.
• Statement in 2004
• Guidelines 1991 by CDC was not scientific based, not cost-effective, and were intrusive to the extreme.
• The recommendations were irrelevant and counterproductive.
• CDC ignored the overwhelming testimony of the scientific community, and the fact that all currently available data indicate that transmission from surgeon to patient in a hospital setting continues to be a hypothetical event.
• Available data indicate that transmission of HIV infection from physician, surgeon, or nurse to patient is extremely rare.
• Mandatory testing and limiting of work, are not justified.
### Society of Healthcare Epidemiology of American (SHEA) 2010 recommendation

**Table 1. Summary Recommendations for Managing Healthcare Providers Infected with Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and/or Human Immunodeficiency Virus (HIV)**

<table>
<thead>
<tr>
<th>Virus, circulating viral burden</th>
<th>Categories of clinical activities(^a)</th>
<th>Recommendation</th>
<th>Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HBV</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$&lt; 10^4$ GE/mL</td>
<td>Categories I, II, and III</td>
<td>No restrictions(^b)</td>
<td>Twice per year</td>
</tr>
<tr>
<td>$\geq 10^4$ GE/mL</td>
<td>Categories I and II</td>
<td>No restrictions(^b)</td>
<td>NA</td>
</tr>
<tr>
<td>$\geq 10^4$ GE/mL</td>
<td>Category III</td>
<td>Restricted(^c)</td>
<td>NA</td>
</tr>
<tr>
<td><strong>HCV</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$&lt; 10^4$ GE/mL</td>
<td>Categories I, II, and III</td>
<td>No restrictions(^b)</td>
<td>Twice per year</td>
</tr>
<tr>
<td>$\geq 10^4$ GE/mL</td>
<td>Categories I and II</td>
<td>No restrictions(^b)</td>
<td>NA</td>
</tr>
<tr>
<td>$\geq 10^4$ GE/mL</td>
<td>Category III</td>
<td>Restricted(^d)</td>
<td>NA</td>
</tr>
<tr>
<td><strong>HIV</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$&lt; 5 \times 10^2$ GE/mL</td>
<td>Categories I, II, and III</td>
<td>No restrictions(^b)</td>
<td>Twice per year</td>
</tr>
<tr>
<td>$\geq 5 \times 10^2$ GE/mL</td>
<td>Categories I and II</td>
<td>No restrictions(^b)</td>
<td>NA</td>
</tr>
<tr>
<td>$\geq 5 \times 10^2$ GE/mL</td>
<td>Category III</td>
<td>Restricted(^d)</td>
<td>NA</td>
</tr>
</tbody>
</table>

\(^a\) The infected HCW

(1) Not detected as having transmitted infection to patients;

(2) Obtains advice from an **Expert Review Panel** about continued practice;

(3) Follow-up routinely by **Occupational Medicine staff**

(4) Follow-up by **HIV physician** and who is allowed to communicate with the Expert Review Panel about the provider’s clinical status

(5) Consults with an expert about optimal **infection control procedures**

(6) Agrees to the information in and signs a **contract or letter** from the Expert Review Panel that characterizes her or his responsibilities
Dear Dr. [Name]:

[Hospital or Health Department name]'s Expert Advisory Panel on Infected Healthcare Workers met on [date], to discuss your case. The Panel reviewed the medical literature relevant to healthcare workers infected with [HBV, HCV, HIV]. In addition, we reviewed guidelines, including the 1991 CDC Guideline pertaining to healthcare workers infected with bloodborne pathogens and the position statements of selected medical professional societies pertaining to the guideline. The Panel concluded the following:

You are permitted to continue your [specialty/subspecialty] training or practice at [hospital name]. If you agree to the Panel requirements below, it is mutually understood that you will comply with the following guidelines:

- You must double-glove for all [discipline] procedures, whether those procedures are carried out in the operating room, in an imaging suite, at the bedside, or in a treatment room.

- You must change gloves approximately every 2-3 hours, or in the event that glove damage occurs during a procedure. Glove damage has been shown to occur more frequently during longer procedures, and has been specifically associated with certain activities, (e.g., tying sternal wires). You are encouraged to increase your frequency of glove changes under such circumstances.

- You should avoid digital palpation of needle tips and blind probing in poorly visualized or highly confined anatomic sites.

- If you suffer an injury which penetrates your gloves and skin, but during which you do not observe contact of your blood with the surgical field, you should check your hands to be certain you are not bleedin g. If you are not bleeding, you may rejoin the case after changing gloves. If you are bleeding, you should withdraw from the case. If the device that injured you recontacted the patient, you must notify [your representative to the expert review panel] who must assure that the patient is made aware of the potential exposure and is treated appropriately.

- If you suffer an injury that causes you to bleed during a procedure and your blood contacts the surgical field, you must withdraw from the case and contact [your representative to the expert review panel] immediately. She/he will assure that the patient will be informed that a possible [HBV/HCV/HIV] exposure has taken place and the patient will be offered appropriate postexposure management, including immuno-/chemoprophyaxis and follow-up, as appropriate. To the extent possible, your identity will be protected.

- The Panel requests that you continue under the care of a physician with expertise in [HBV/HCV/HIV] medicine in order to appropriately monitor and manage your illness.

If you agree to the outlined restrictions on your practice, please sign below.

Signature: ___________________________ Date:______________

Witness: ___________________________ Date:______________

[Name, Expert Advisory Panel Representative]
UK guidance 2005

- HIV infected HCW must **not** perform any EPP
- Patients notification exercise:
  - **Evidence of HIV transmission**: notification of **all patients** who have undergone EPP by that HCW should take place.
  - **No evidence of HIV transmission**: all patients who have undergone **category 3 procedures** by the HCW should be notified.
  - Only **category 1 or 2 procedures** done: patient notification will **not be necessary**, unless the other relevant considerations suggest that it is

**Drawback**: didn’t take viral load and clinical condition of the HCW into consideration
HIV-infected HCWs are permitted to perform any EPP if they are on HAART and have a viral load <200 copies/ml.

Testing every 3 months while continuing to perform EPPs.

HIV-infected HCWs will be under the joint supervision of a consultant in occupational medicine and their treating physician.

New HCWs, including students, who will perform EPPs should be tested for HIV infection early in the appointments/admissions process.
Management in Hong Kong
Professional code and conduct
香港註冊醫生專業守則

• In part II, section 24.2.3: Rights and responsibilities of HIV-infected medical practitioners

24.2.3.1 Confidentiality:

• Medical practitioners are not required to disclose their HIV status to their employers or clients.

• HIV infection and AIDS are not notifiable diseases by law in HK, and reporting is on a voluntary basis.

• HIV status has to be made known on a need-to-know basis, and this will normally be with the consent of the infected practitioner.

• In exceptional circumstances, breach of confidentiality may be warranted, for instance, when an HIV-infected medical practitioner refuses to observe the restrictions and patients have been put at risk.
Professional code and conduct

24.2.3.2 Right to work

• The status and rights of an HIV-infected medical practitioner as an employee should be safeguarded.

• If work restriction is required, employers should make arrangement for alternative work, with provision for retraining and redeployment.
Professional code and conduct

24.2.3.3 Ethical issues

• An HIV-infected medical practitioner should seek appropriate counselling and to act upon it when given.

• It is **unethical** if one fails to do so as patients are put at risk.

• The attending doctor of an HIV-infected medical practitioner should seek the advice of the **expert panel** formed by the **Director of Health** on the areas of management and possible need for job modification

• The doctor who has counselled an HIV-infected colleague on job modification and who is aware that the advice is not being followed and patients are put at risk has a duty to **inform the Medical Council for appropriate action**.
Professional code and conduct

24.2.4 Responding to the public

• Focusing on health-care setting in fact deflects the society from proper attention to the major transmission routes through sex and drug abuse.

• The health care profession has the duty of constantly reassuring the public, and to educate the clients on how HIV can and cannot be contracted.

• More importantly, the public looks on the health-care profession as an example of how AIDS should be dealt with.

• By adhering to the guidelines for prevention of HIV infection in the health-care setting, public fear can be allayed
Recommendations on Infection Control Practice for HIV Transmission in Health Care Settings

Scientific Committee on AIDS co-sponsored by the Hong Kong Advisory Council on AIDS and the Centre for Health Protection, Department of Health

January 2005
4.6 Recommendation on Work restrictions for healthcare workers exposed to, or infected with, selected infectious diseases

It is recommended that the Infection Control Unit and Staff Clinic would formulate the work restrictions protocols for healthcare workers.
為什麼你有這樣的郵票。如果你舔後，有機會受到感染的。
Thank