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Occupational Exposure to HIV Among Health Care Providers: A Qualitative Study in Yunnan, China

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Abstract

With the HIV/AIDS epidemic spreading, health care providers (HCPs) in China are facing a growing risk of occupational exposure to and infection with HIV. There is a need to describe occupational exposure cases and compliance with postexposure prophylaxis (PEP) guidelines among HCPs. Qualitative in-depth interviews were conducted with 33 HCPs in Yunnan Province, China. Information about occupational exposures the HCPs and their co-workers experienced was collected and analyzed using ATLAS.ti. Most occupational exposure accidents happened during emergencies, when HCPs did not have time to consider self-protection. Exposure to HIV caused exposed HCPs severe adverse psychological pressure, such as stress and anxiety. Compliance with PEP guidelines among participants was poor; barriers to better compliance were identified. This study underscored the importance of institutional support in promoting compliance with PEP guidelines among exposed providers. Further training and emphasis on universal precautions and PEP guidelines may reduce the risk of occupational infections.

Keywords

occupational exposure; HIV; health care providers; China; qualitative study

The rapidly spreading HIV/AIDS epidemic has made a huge impact on the health care system in China. In addition to the increasing demand of services, there is a lack of HIV/AIDS-related training and health resources, and health care providers (HCPs) are facing a growing risk of contracting HIV by means of contact with blood and other bodily fluids at work.¹ The risks for occupational transmission vary with the type and severity of exposure. In prospective studies of HCPs, the average risk of HIV transmission after a percutaneous exposure to HIV-infected blood was estimated to be approximately 0.3%, and approximately 0.09% after a mucosal membrane exposure.² According to the World Health Organization, every year there are approximately 3 million percutaneous exposures among HCPs worldwide.³ These exposures are estimated to result in 200 to 5000 HIV infections. Although the exact number of people experiencing occupational HIV exposures and infections in China is not available, given that there are currently 650 000 Chinese living with HIV,⁴⁻⁵ there is a need to ascertain the level of occupational HIV exposure among HCPs in China.

The first occupationally acquired HIV infection was reported in 1984.⁶ Since then, a wide range of risk-management strategies such as regulatory controls, best exemplified by the Occupational Health and Safety Administration's Bloodborne Pathogen standard,

administrative controls, and engineering controls have been implemented to reduce the risk of exposure incidents and subsequent infection for HCPs around the world.⁷ In addition, there have been greater efforts in preventing infection after an exposure incident. A range of regulations and interventions have been implemented to maximize safety of HCPs after occupational exposure. In China, the official guidelines for the management of occupational exposures to HIV and recommendations for postexposure prophylaxis (PEP) were disseminated in June 2004. The guidelines require local management, prompt reporting, evaluation, counseling, treatment, and follow-up of all occupational exposures.⁸

However, according to the experience of other countries, the availability of PEP guidelines does not ensure effectiveness. Availability of information and resources was not enough to guarantee compliance of HCPs with PEP guidelines in Brazil.⁹ The study by Kiertiburanakul and colleagues suggested that adverse effects of antiretroviral medications, such as gastrointestinal reactions, were frequent reasons for the discontinuation of therapy.¹⁰ Therefore, the tolerability of PEP regimens among HCPs was poor, which in turn compromised treatment efficacy.

Although there are some quantitative studies focused on the topic of PEP, qualitative studies on underlying reasons for the lack of compliance are absent, and little is known about the actual experiences of HCPs, as well as their awareness and attitudes toward HIV occupational exposure. Furthermore, there is a paucity of research investigating occupational exposure experienced by HCPs in China. Our study used qualitative methods to examine the real experiences of HCPs with occupational exposure: what they do, what they think, and what practical difficulties they face within a Chinese context. The findings from this study will be beneficial in revealing opportunities available to improve the health care system in China.

Methods

This study was part of a larger study that aims to decrease HIV/AIDS-related stigma and discrimination in health care settings. Between July and October, 2004, 33 in-depth qualitative interviews were conducted with HCPs in 3 sites in Yunnan Province, China. Yunnan Province was chosen because it has the highest number of reported HIV-infected individuals in China.¹¹ The study received approval from the Institutional Review Board of both the University of California, Los Angeles (UCLA), and the China Center for Disease Control and Prevention (CCDC). The in-depth interview guide for health care providers was designed through a collaborative effort between the project research team and the local Community Advisory Board (CAB). The CAB consisted of administrators from the local US Centers for Disease Control and Prevention (CDC), local health bureau officials, local health care providers, and family members of people living with HIV/AIDS (PLWHA). The CAB gave consultation on cultural appropriateness and content applicability of the study design and interview questions.

Participating HCPs were selected from provincial, city, county, township, and village level hospitals and health stations. Before recruitment, we gathered hospital information such as number of beds, number of staff, reported HIV cases per hospital, and HIV screening test capability from local health bureaus and the local CDC. From each level, we selected health care settings with the greatest volume of HIV testing and highest number of HIV cases reported. In each health care setting selected, we asked the principal of the hospital to recommend several doctors, nurses, and laboratory technicians who were familiar with the hospital situation and HIV-positive treatment procedures to interview. To obtain comprehensive information, we selected HCPs from different departments and different professions.

In-depth interviews were approximately 2 hours long and were held in a private room. Before interviews, respondents were informed of the study purpose, procedures, potential benefits, and risks of the study; informed consent procedures were used; and participation was voluntary. Interviews consisted of open-ended questions about knowledge, attitudes, perceived risk of occupational exposure to HIV and infection. Questions were also asked about personal experience with occupational exposure and PEP. Those who had not experienced occupational exposure were asked about their co-workers' exposure experiences and what they would do in case of exposure to HIV. To allow flexibility and spontaneity as new content was revealed during interviews, it was not required that the interview questions be asked in the same order or with the same wording. All questions in the interview guide, however, were covered in each of the interviews. All interviews were audio recorded for further analysis, and no personal identifiers of the respondents were linked to the recorded interviews.

Approximately 60% of the respondents were men, and 80% of the total were of Han ethnicity, the ethnic majority in China. The average participant age was 35.7 years, with a range of 24 to 53 years. The education level ranged from academic secondary school to graduate school. Approximately 45% had a 4-year medical degree or above. Of the 33 participants, 5 worked in provincial hospitals, 7 in city hospitals, and 4 in county hospitals. The remaining HCPs worked in township or village health clinics. Departments in which participants worked varied from clinical departments such as surgery, internal medicine, gynecology, infectious disease, and dermatology, to administration. The total years of service in the health care field ranged from 4 to 32 years.

All interviews were transcribed by 1 project staff member and cross-checked by another staff member for quality control. If the local dialect was used, a local project member fluent in the local dialect provided help in transcribing the interview. The data were analyzed using ATLAS.ti.¹² Based on the interview guideline and actual content of several interview transcripts, the research team developed the first draft of the code list, which consisted of common themes discovered in the transcripts. To get better intercoder reliability as well as to refine the code list, the first transcript was coded by the research team together.¹³ After several drafts of the code list, a total of 62 codes and 14 code "families" (a group of codes with the same theme) were created. Analysis was accomplished by identifying the themes occurring most frequently in transcripts and adding the context of additional information provided by the respondents.

Results

After analyzing the transcripts, 5 major themes regarding occupational exposure were identified: (1) perceived occupational exposure risk, (2) occupational exposure accidents, (3) postexposure worries and concerns, (4) enforcement of PEP guidelines, and (5) barriers to compliance with PEP. First, a description of HCP's perceived risk of occupational exposure and situations in which occupational exposure occurred will be provided. Then the anxiety, stress, and other adverse psychological effects experienced by the exposed HCPs will be described, along with their worries and concerns. In the third theme, the main focus is the PEP actions taken by exposed HCPs. The gap between what the HCPs actually do and the China Ministry of Health's PEP guidelines are identified. In the last theme, the barriers preventing HCPs from complying with PEP guidelines are discussed. Results for each of these themes are as follows.

Theme 1: Perceived Occupational Exposure Risk

Study participants had different levels of perception on their risk of occupational exposure at work. Approximately half (52%) of the HCPs thought the risk was high. Three doctors

mentioned that no matter how hard they tried to protect themselves, the occupational exposure accident was sometimes unavoidable. As the HIV epidemic continues to grow, their risk becomes higher. However, some other HCPs thought that their probability of exposure to HIV at work is low. Five (15%) HCPs believed that, if they carefully followed the self-protection procedures, the exposure risk could be minimized.

I think the risk of occupational exposure is becoming higher and higher. You see, more and more people are HIV infected, the risk is becoming higher and higher. Maybe someday we will be infected too. (A 31-year-old female township hospital surgical nurse.)

There are accidents every year in our hospital. I should say, exposure for us is sooner or later. It is highly possible. We are facing the risk everyday. (A 47-year-old male provincial hospital emergency room doctor.)

The risk is not high. As I know, there are only 4 accidents in our hospital in history. (A 38-year-old male city hospital doctor in the infectious disease department.)

If you strictly follow the self-protection procedure, it (occupational exposure) won't happen.... We carefully obey the rules and regulations. I don't see it being a problem. (A 45-year-old female city hospital nurse in the infectious disease department.)

Theme 2: Occupational Exposure Accidents

Among the 33 respondents, 5 (15.1%) reported occupational exposure to HIV, 17 (51.5%) reported co-workers' occupational exposure, and 4 (12.1%) HCPs had heard of HIV occupational infection. The reported exposure incidents included needle sticks, sharps injuries, exposure to unprotected mucosa, and exposure to open wounds.

Exposures often happened during cases of emergency, when the HCP did not have enough time to prepare the appropriate protective material. Lack of good communication and cooperation with co-workers was also believed to be a contributing factor of occupational exposure.

It was so urgent, the blood was spewing, what can you do? You can only stop the bleeding immediately. (A 29-year-old male city hospital emergency room doctor.)

Someone passes the needle to you, but you don't get it, thus you get stuck. It happens very often. (A 38-year-old male county hospital surgeon.)

Exposure incidents were also reported to be related to patient's unwillingness to cooperate with HCPs and difficulties inherent in working with certain populations. People living with HIV/AIDS in Yunnan are mostly intravenous drug users (IDU). According to the participants, IDU medical cooperation is relatively low compared with plasma donors.

HIV-positive patients here are very unusual. Most of them are IDU, their cooperation level is kind of low. The first thing they think about when they wake up is where to get drugs. Their veins are totally destroyed; sometimes we have to draw blood from their arteries. It is very dangerous. (A 33-year-old male county hospital dermatologist.)

Four respondents mentioned that due to lack of awareness of a patient's HIV status, HCPs were sometimes "not careful enough" when conducting medical procedures, thus contributing to the exposure. They suggested HIV screening tests as a routine procedure for all patients admitted to the hospital, so they could use personal protective equipment and handle contaminated needles more cautiously.

Carelessness is the major problem. Most accidents happen when health care providers perform operations carelessly. If we know the patient is HIV-positive, we are much more cautious when doing operations, thus reducing the chance of occupational exposure. (A 37-year-old male city hospital doctor in the infectious disease department.)

Working in the emergency room, surgery department, or gynecology department was considered by the respondents to confer the highest risk of occupational exposure. Nurses were thought to have a higher risk of exposure than doctors and laboratory technicians.

[Workers in the] ER, operating room, gynecology department, and surgery department [have a higher risk of occupational exposure]. (A 33-year-old male county hospital dermatologist.)

Compared with physicians, nurses have a higher risk of exposure, because doctors are mainly responsible for doing physical examinations and giving prescriptions, while nurses are the ones who touch the blood. That's the difference. (A 40-year-old male city hospital surgeon.)

Theme 3: Postexposure Worries and Concerns

Most HCPs had experienced adverse psychological feelings, such as nervousness, and feelings of desperation and anxiety in the hours following the accidents.

My co-worker started to cry right away in the operating room. She was so afraid of being infected. (A 37-year-old female city hospital gynecologist.)

Of course I was so nervous.... I had so much pressure in that 3 months, I didn't feel relief until June 10th, when I got the negative result. (A 49-year-old female city hospital surgical nurse.)

When I got stuck with the needle, I really wanted to cut my fingers off! (A 33-year-old male city hospital dermatologist.)

I had a very strong reaction, I should say I was so desperate, very desperate ... if it really happened, my heart would be broken. I dare not to think about it, it was too terrible, too terrible. (A 37-year-old male city hospital doctor in the infectious disease department.)

Their concerns came from several domains. In many cases, the first thing HCPs thought about after exposure was their family. The HCPs who were married felt uneasy informing their partner and explaining what happened. At the same time, they were worried about their family member's safety. Some exposed HCPs changed their sexual practices and began to use condoms for safer sex with their spouse; however, they did not want their spouse to know that they had been exposed to HIV at work, so they had to come up with an excuse to explain the unusual behavior. One respondent said he even began to worry about his son's future. This reflected that postexposure anxiety can at times be devastating.

I have experienced it. I know very clearly that the thing we care about most after exposure is what to do with our family and how to explain it to them? And what if your wife got infected [through you]? (A 33-year-old male city hospital dermatologist.)

[After the exposure] my colleague dared not to go back home, and he lived in the office alone. (A 29-year-old male city hospital surgeon.)

If your co-workers, friends, or significant other got infected with HIV just because of your work, how could you face them? You have no way to face them! (A 37-year-old male city hospital doctor in the infectious disease department.)

The second concern was whether they could get enough support from the employing institution. Most respondents said they were not aware of any policies for occupational infections.

If I reported it to the hospital, would they take responsibility? Could they help me? We are not protected. We have no insurance ... there is no regulation telling us what health care providers get if they are infected. Who will pay for our treatment? Does it count as an occupational injury? There is no law telling us that. (A 33-year-old male city hospital dermatologist.)

The third area of concern was their future career. One respondent said that the thing he was afraid of was that he would be forced to leave his beloved work if he got infected.

As a surgeon, I consider surgery my career; I value it very much ... if I were forced to leave the operating room, my life would be hopeless ... I love my work dearly, it is not acceptable for me to do another job. (A 32-year-old male provincial hospital surgeon.)

Last, societal discrimination was another possibility that HCPs feared; 2 respondents said that, if they got infected with HIV at work, people would nevertheless suspect their transmission route, which would be highly humiliating for them.

Normal, it is normal, but in other people's minds ... will I be discriminated against? When talking about HIV, will people look down on me? (A 49-year-old female city hospital nurse in the internal medicine department.)

You say you are infected because of work, but nobody will believe you. The hospital won't believe you, and the government won't believe you either. (A 40-year-old male city hospital surgeon.)

Theme 4: Enforcement of the Postexposure Prophylaxis Guideline

According to the China 2004 guidelines for the management of occupational exposures to HIV (Ministry of Health, People's Republic of China, 2004), PEP treatment should be started as soon as possible, no later than 24 hours after the exposure. The basic treatment includes continuous use of two nucleoside reverse transcriptase inhibitors for 28 days. HIV testing is required at 4, 8, and 12 weeks after the exposure, and then 6 months after exposure. However, despite the dissemination of guidelines for the management of occupational exposures to HIV, according to our interview participants, the guidelines are poorly implemented. More than half of the HCPs reported that they were not aware of local laws or rules regarding PEP. As a respondent said:

We haven't discussed this issue in our hospital so far, we have never thought about it, because it has never happened before. (A 45-year-old male provincial hospital doctor of internal medicine.)

Among those who had experienced occupational exposure (including a co-worker's exposure experience), almost none had fully followed PEP guidelines. One reason given by participants was that postexposure treatment was not thought to be effective.

You could do nothing about it. It is all in the past. All the things you could do are just useless. (A 33-year-old male county hospital surgeon.)

When asked what they would do in case of occupational exposure to HIV, almost every participant said they would perform a local sterilization procedure such as washing the wound and applying disinfectant. Four HCPs reported they would not take an HIV screening test after exposure.

I know there is a window period of 3 months to 6 months or longer. It is useless to get the test. (A 40-year-old male city hospital surgeon.)

Despite the guideline's requirement that 4 postexposure HIV tests be taken, almost all of the exposed HCPs interviewed took only 2 HIV tests, usually at the time of exposure and 3 months later. Only 8 (24.2%) of the participants said they took or would take PEP medication in case of exposure, but they were very confused about which drug to take, whether it is oral or by injection, and the duration the medication should be taken for. One respondent said that he would inject "seroglobulin" in case of exposure, which is not the drug regulated by the guideline. Among the 5 HCPs who had actually been exposed to HIV at work, only 1 of them had fulfilled a 28-day PEP treatment; 2 of them took antiretroviral therapy for 2 days only, and the other 2 did not take any drugs after exposure. None of the respondents mentioned monitoring or management of PEP toxicity. Usually, there is no excuse from work or monetary compensation for the exposed HCPs.

Theme 5: Barriers to Compliance With PEP

From the interviews, we identified the following 4 barriers to following PEP guidelines. First, some respondents said that the leaders of the hospital did not pay enough attention to occupational exposure. In many cases, no compensation or insurance was given to the exposed HCPs, so the HCPs were disappointed by the indifferent attitude of management.

Basically [the leaders] won't ask you about that. None of the leaders will show their sympathy. None of them care. (A 37-year-old male city hospital doctor in the infectious disease department.)

After I reported the accident, they didn't say too much ... they didn't say how they would compensate me if I got infected. They didn't promise that they would treat me if I got infected ... or No definite answers. I was so disappointed. (A 33-year-old male city hospital dermatologist.)

The second barrier was the HCP's ignorance of the severity of potential occupational infection and PEP. We found that some HCPs knew nothing about PEP. Some HCPs did not even know what occupational exposure was. Although some of the interviewees reported that they had received training on PEP, they failed to show a clear understanding of the prophylaxis procedure in the interview. Regardless of the dissemination of PEP guidelines, many HCPs had no knowledge of it. Some HCPs did not pay enough attention to it and missed the opportunity to get prophylaxis medication.

I wouldn't know what to do [after exposure] ... what do you think? What if I were exposed and got infected? I really have no idea. It is so confusing to me. That would be terrible, that would be sad We do not have such regulations...I wouldn't know where to report ... there is no rule in our hospital to regulate this. (A 37-year-old male city hospital doctor in the infectious disease department.)

No ... I don't think [a postexposure HIV test] was necessary; I am brave. (A 45-year-old male county hospital surgeon.)

She didn't tell anyone about the accident until 10 days later. (A 35-year-old female provincial hospital dermatologist.)

A third barrier was that, although the postexposure guidelines have specified what medication to take, the medication was not always available in the local hospitals, especially lower level hospitals. The HCPs would have to get medication from other institutions in cases of exposure. One participant pointed out that the PEP medication was too expensive for the rural hospital, so the hospital pharmacy felt reluctant to buy and store medication that is not used very often.

I had a look at the date, the medicine was expired. I am so scared ... it was so urgent ... but we didn't have the medicine in stock in our hospital. Only the local CDC has the medicine (A 38-year-old male city hospital doctor in the infectious disease department.)

The PEP drug is very expensive; we have requested it before, but the pharmacy's response was that the medicine is too expensive, and there is little chance it will be used. It will just wait there untouched until it expires. (A 31-year-old male city hospital doctor in the infectious disease department.)

The side effects of postexposure drugs were a fourth barrier that reduced compliance of the exposed HCP. Some exposed HCPs stopped the PEP drug before completing treatment because of headaches, nausea, and other side effects (usually gastrointestinal reactions). Although side effects were mentioned, none of the respondents spoke of the toxicity monitoring system of PEP in the hospital.

On the seventh day of my taking the pills, I began to feel headache and nausea (A 49-year-old female city hospital nurse in the internal medicine department.)

The gastrointestinal reaction is unbearable, you feel so terrible ... afterwards they have to stop the medication without finishing it. (A 37-year-old female city hospital gynecologist.)

Discussion

The reported occupational exposure experience is high in our study, but the sample may not be representative of the HCP population in China, because when management recommended certain individuals for participation, they recommended those who had more contact with PLWHA at work, and those with occupational exposure experience.

Research indicates that exposure to HIV/AIDS in health care settings causes serious adverse psychological outcomes for HCPs, leading to stress, burnout, and dropping out of their practices.^{14,15} The adverse psychological outcomes they experience likely have negative effects on the quality of care HCPs provide for PLWHA and other patients and, thus, need to be addressed.

To reduce adverse effects of occupational exposure among HCPs, we recommend providing immediate and comprehensive psychological support to exposed HCPs and their family members. Ongoing counseling, monitoring, and treatment for the exposed HCPs are needed. The exposed HCP might need time off and treatment, so approved leave from work and monetary compensation are needed for exposed HCPs.

Because the worries and concerns perceived by exposed HCPs mainly come from the fear of occupational HIV infection and its consequences, an efficient insurance system must be built for doctors, nurses, and laboratory technicians who are working with PLWHA. If they are infected with HIV/AIDS at work, the insurance system should cover their treatment expenses for life. This will help reduce the fear of caring for PLWHA among HCPs.

From several interviews, we found that societal discrimination toward AIDS patients plays an important role in the adverse psychological consequences perceived by HCPs after occupational exposure. If HIV/AIDS were treated as a normal disease by the general population, HCPs would feel more comfortable when providing service for PLWHA. They would also feel less stress and anxiety when exposed to HIV at work. This finding suggests that stigma reduction in the general population is essential to reducing the psychological burden experienced by HCPs in cases of exposure.

The study reveals the gap between PEP guidelines and actual practices among HCPs. Moreover, the majority of respondents failed to show sufficient knowledge of PEP procedures. Therefore, proper training of universal precautions and PEP is necessary for HCPs in their daily practice. There are several points the training should address. First, the trainings should give HCPs a better understanding of the HIV/AIDS epidemic in China, making them aware of the fact that HIV/AIDS is no longer a “foreign” disease. There is a chance they will see HIV/AIDS patients at work. Second, universal precaution is the first line of defense to prevent occupational exposures. Training should enhance HCP's understanding of universal precaution, which requires every patient to be treated as if they were HIV-positive, thus reducing the risk of occupational exposure. Third, such training should emphasize the risk of being infected by HIV during an occupational exposure. At the time of exposure, HCPs should be alert enough to take immediate action, thus reducing unnecessary delays. Furthermore, trainings should be conducted periodically to ensure that HCPs fully understand the standard procedure of PEP, so that in case of exposure they will know what to do, where to get treatment, where to report, and so on. Written materials in the form of a brochure or handout on PEP procedures for every HCPs might be very helpful.

From the study, it was evident that lack of institutional support is an important barrier for HCP's compliance with taking PEP. Because the drugs for HIV PEP need to be started as soon as possible, hospitals should have better preparation of the drugs. It would be better for every hospital, rather than just the local CDC, to store and monitor PEP drugs, thus enhancing accessibility to the drug and shortening the time from exposure to treatment.

Hospital management should attach more importance to the safety of HCPs. Department supervisors should encourage the enforcement of PEP guidelines. Department gatekeepers should reinforce knowledge of PEP guidelines during their daily work. Department heads should be required to give more attention and support to exposed HCPs. For example, managers should discuss the accident with the exposed HCP, periodically checking the side effects of PEP drugs and listening to the worries and concerns of the HCP.

Drug intolerance is found to affect adherence to PEP guidelines, but the current effort in monitoring drug toxicity is far from adequate. Adverse effects of PEP drugs, most frequently gastrointestinal symptoms, should be controlled promptly to avoid worse consequences.

Although the study has several interesting findings, several limitations should be addressed. First, the study was conducted in Yunnan Province, which has a high prevalence of HIV infection; the findings may not be generalizable to HCPs in other provinces of China. However, we expect the situation may be worse in low-prevalence areas. Second, because the study relied on self-reported data, the findings may be prone to issues of recall accuracy. Third, because the study is part of a larger study with a different aim, of the 33 HCPs interviewed, just 5 had been exposed to HIV in the workplace. Although the HCPs with no occupational exposure experience reported the exposure accidents of their co-workers in the interview, the information tends to be less accurate. Despite the limitations noted here, our findings underscore the needs and barriers for better compliance with PEP guidelines among China's health care providers.

This qualitative study provides an overview of occupational exposure of HCPs as part of HIV/AIDS control. In conclusion, the occupational exposure issues of HCPs need more attention. The lack of awareness of the postexposure prophylaxis for HIV/AIDS has a tremendous impact on the public health system in China. Therefore, a full-scale evaluation of PEP procedures among HCPs should be conducted. Furthermore, new strategies must be developed to reduce the risk of occupational exposure in health care facilities. PEP

procedures and guidelines must be enhanced with more details. Institutions and HCPs must implement these regulations in their daily work.

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