



Uncommon Transmission of HIV Infection Due to a Criminal Knife Fight

Shahnaz Sali¹, Simin Dokht Shoaie², Shabnam Tehrani¹

1- Infectious Diseases and Tropical Medicine Research Center AND Department of Infectious Diseases, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

2- Department of Infectious Diseases, School of Medicine AND Clinical Research and Development Center, Imam Hossein Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Received: 18 December 2016

Revised: 04 February 2017

Accepted: 25 February 2017

ARTICLE INFO

Corresponding author:
Simin Dokht Shoaie

Email:
drsimin2@yahoo.com

Keywords:
HIV;
Transmission;
Blood borne;
Trauma

ABSTRACT

Appropriate screening for HIV infection is the cornerstone of HIV-related care. Clinicians should be aware of criminalizing HIV exposure and transmission. We report a case of HIV-1 infection transmission caused by a knife fight between addicts and criminals. He was overlooked as an innocent victim and infected his wife without diagnosis. He was injured with a bloody knife used to damage a man minutes before. His 33-year-old wife was admitted with respiratory distress and responded to the treatment of pneumocystosis. In workup for predisposing factor of this opportunistic infection, AIDS was confirmed. The possible route of HIV-1 transmission was investigated and concluded most likely resulted sexually from his husband. Both of them have no behavioral risk factor for HIV infection. Peoples and physicians should be educated about epidemiology, transmission, and pre- and post-exposure prophylaxis of HIV.

Citation: Sali S, Shoaie SD, Tehrani S. **Uncommon Transmission of HIV Infection Due to a Criminal Knife Fight.** Case Rep Clin Pract 2017; 2(1): 9-12.

Introduction

HIV is transmitted by sexual contact, blood and blood products, and vertically to fetus. Transmission spread through transfusion, medical injection, and sharing needles for drugs (1). There are unusual transmission routes such as with

bloody effusions, human bite, and tattoos. Any blood tinged device can transmit the virus (2).

This is the first report in Iran to suggest that HIV transmission likely occurred during a knife fight with a bloody knife from one previous infected victim to other uninfected victim. The injured victims with one knife

were overlooked expect only for suturing the ulcers and transmitting HIV from one to other one and then to his wife.

Case Report

A 33-year-old homemaker was admitted to the infectious disease ward of Imam Hossein Medical Center in Tehran with progressive exertional dyspnea from 1 week ago as Function Class I and II toward IV in 2 days before admission with fever, nonproductive cough, and pleuritic chest pain without sweating and hemoptysis. She had 10 kg weight loss in the last year. The patient has no other complaints, disease, and any medication. She has no history of blood transfusion, surgery, addiction, and no sexual contact out of marriage. In physical examination on admission, she arose and orientated respiratory distress with respiratory rate: 40/min, pulse rate: 120/min, blood pressure: 80/60 mmHg, axillary temperature: 38° C, O² saturation 77% without O², temperature (38.5° C), tachypnea, tachycardia, and hypoxia and diffuse rales in both lungs. In remained examination, no pathologic finding was detected. In chest X-ray, there was diffuse bilateral diffuse symmetric reticulonodular pattern and ground glass pattern in chest computed tomography-scan.

Laboratory examinations revealed an arterial blood gas with pH: 7.49, PO₂: 41.9, PCO₂: 22.5, O₂ saturation: 81%, complete blood count with white blood cell: 8000, lymph: 9%, poly: 86%, mon: 5%, hemoglobin: 11.7, platelet: 346,000, erythrocyte sedimentation rate: 88, C-reactive protein: 3+, creatinine: 0.8, blood urea nitrogen: 20, lactate dehydrogenase: 807, alanine transaminase: 24, aspartate aminotransferase: 32, alkaline phosphatase (AIP): 272, triglyceride: 107, cholesterol: 114, sputum smear for *Mycobacterium tuberculosis* infection were all 3 times negative. Routine urine was within the normal ranges with negative culture.

The patient was treated for community acquired pneumonia with ceftriaxone-azithromycin, and because of poor condition,

respiratory distress, hypoxemia, and chest X-ray pattern; cotrimoxazole was initiated with adjuvant steroid for hypoxemia. With the impression of pneumocystosis, risk factors were checked. Two HIV-Ab enzyme-linked immunosorbent assay (ELISA) and Western Blot all were positive. She had no history of addiction, transfusion, and sexual contact out of marriage. Her husband was tested and found to be positive ELISA and Western Blot for HIV-Ab. He also had neither history of injecting drug use nor any high-risk behaviors for HIV-1 infection.

In new social and medical history taking, he mentioned about a fight between addicts and criminals 4 years ago. He reported an injury in a knife fight with three injured victims with one common knife. The victims were exposed to the each other's blood. His ulcer on trunk was sutured and overlooked as innocent bystander. After 4 weeks, he had fever, myalgia, malaise, and loss of appetite, resolving after 5-6 weeks without any diagnosis and treatment.

In 10th day of treatment, she was discharged with good condition and continuing outpatient therapy for pneumocystosis and antiretroviral therapy (ART). Fortunately, their only 6-year-old boy was HIV negative.

Discussion

HIV disease is a progressive and mortal without treatment though ART has treated and saved them in a high rate, prophylaxis is the main management as pre- and post-exposure. Hence, the exposed persons should be founded. The main HIV transmission routes are by blood, sexual contact, and mother to fetus. Blood can be transmitted with transfusion, needle stick, bite with damaged gums, and any bloody body fluids. Any blood-contaminated device can transmit the virus as knife (3).

In this criminal victim, a knife had been contaminated to the first victim and transferred to the next. Of course, the

diagnosis of this route can be showed by phylogenetic analysis and most closely related sequences which have not been done. If the three victims which were injured with one knife were evaluated for HIV and underwent chemoprophylaxis, he and his wife would be saved. Kao et al. (4) also reported similar bloody knife fight victim in a robbery. Phylogenetic analysis showed most closely related to and nested within a lineage comprised the robber's HIV-1 sequences and the victim. The phylogenetic study was used in the early 1990s to determine the source of infection of five patients treated by an HIV-positive Florida dentist (5). Although comparison with phylogenetical data validates the link of suspected HIV transmission, it does not establish the direction of the transmission nor does it prove that additional individuals could not have been involved in a series of intermediate events (6). Of course, the much genetic diversity of HIV affects the results (7). Since the beginning of the HIV/AIDS epidemic, new or potentially unknown routes of transmission have been thoroughly, but to date, no additional routes of transmission have been recorded except unusual cases. Matsuda recently reported two HIV infected cousin who shared manicure utensils 10 years ago one with advanced disease. Phylogenetic analyses of partial HIV-1 polymerase and envelope sequences from both patients revealed highly related sequences, with an estimated common ancestor date (about 11 years ago) that coincided with the putative sharing of manicure instruments suggesting the use of shared manicure instruments as an alternative route of fomite HIV-1 transmission (8).

Emerson reported a case of HIV-1 infection transmission caused by a fist fight between brothers. A bloody fight had occurred between them 4 weeks before the onset of symptoms. Phylogenetic analysis indicated that samples from both brothers belonged to the subtype C clade of HIV-1 and that the sequences were closely related to one another. Exposure risk data are extremely

useful in helping counsel patients before HIV-testing but, as this case illustrates, does not cover all situations (9).

This patient was infected by sexual contact. There is evidence that some form of domestic contact involving unperceived blood transfer may have occurred for example using common razors in interfamilial transmission (10). Fortunately, their 6-year-old boy was not infected. His wife had no pregnancy in this period and transmitting HIV to fetus.

It may be concluded that it is important to monitor the probable HIV-1 transmission route in criminal cases and remember only suturing is not enough, especially for the physicians who work in emergency and trauma clinics particularly when managing physical trauma during a bloody fight if involving HIV positive or high-risk individuals with the potential for HIV transmission. HIV and other blood-borne diseases can be transmitted between victims injured with one common sharp vehicle and all need to be evaluated.

Conflict of Interests

Authors have no conflict of interests.

Acknowledgments

We sincerely thank our coworkers, who were involved in managing this patient but did not have the criteria of authorships.

References

1. Assari S, Ahmadi K, Rezazade M. Socio-economic status determines risk of receptive syringe sharing behaviors among Iranian Drug injectors; A National Study. *Front Psychiatry* 2014; 5: 194.
2. Bennett JE, Dolin R, Blaser MJ. Mandell, Douglas, and Bennett's principles and practice of infectious diseases. 8th ed. Philadelphia, PA: Saunders; 2015. p. 1483-1503.
3. Riddell A, Kennedy I, Tong CY. Management of sharps injuries in the healthcare setting. *BMJ* 2015; 351: h3733.
4. Kao CF, Hsia KT, Chang SY, Chang FY, Nelson K, Yang CH, et al. An uncommon case of HIV-1 transmission due to a knife fight. *AIDS Res Hum*

- Retroviruses 2011; 27(2): 115-22.
5. Ou CY, Ciesielski CA, Myers G, Banda CI, Luo CC, Korber BT, et al. Molecular epidemiology of HIV transmission in a dental practice. *Science* 1992; 256(5060): 1165-71.
 6. Serafino S, Cella E, Montagna C, Cavallari EN, Vittozzi P, Lo PA, et al. An epidemiological investigation to reconstruct a probable human immunodeficiency virus-1 transmission network: a case report. *J Med Case Rep* 2015; 9: 253.
 7. Ren L, Wang HW, Xu Y, Feng Y, Zhang HF, Wang KH. Sequencing of Gag/Env association with HIV genotyping resolution and HIV-related epidemiologic studies of HIV in China. *Genet Mol Res* 2016; 15(4): 1-11.
 8. Matsuda EM, Coelho LP, Pimentel VF, Onias HB, Brigido LF. An HIV-1 transmission case possibly associated with manicure care. *AIDS Res Hum Retroviruses* 2014; 30(11): 1150-3.
 9. Emerson CR, Quah SP. Transmission of HIV-1 infection due to a fist fight. *Int J STD AIDS* 2008; 19(2): 131-2.
 10. French MA, Herring BL, Kaldor JM, Sayer DC, Furner V, de Chaneet CC, et al. Intrafamilial transmission of HIV-1 infection from individuals with unrecognized HIV-1 infection. *AIDS* 2003; 17(13): 1977-81.