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A case of human bite by an 11-year old HIV positive girl in a Paediatrics ward

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Summary

Biting is a possible mode of transmission of HIV infection, though the risk of such transmission is believed to be low. Children infected with HIV are at risk of psychological complications as a result of direct or indirect effects associated with the disease. We report the case of an 11 year old HIV positive girl with clinical stage IV disease, who was involved in multiple disputes while on admission on the ward. During one of the disputes she inflicted a deep bite injury on a 10-year old boy. HIV post-exposure prophylaxis (PEP) was commenced 6 hours after the bite and he has remained HIV negative 12 months later. What is peculiar about this case is that the incident occurred in a hospital setting and biting is not usually expected among children of this age. In the era of HIV/AIDS, it is recommended that persons involved in childcare be aware of this potential risk during interactions among children. It is also essential for health care personnel to have sufficient knowledge about PEP in order to reduce the risk of HIV transmission in similar settings. In addition, a multi disciplinary approach to the management of children living with HIV is important in order to identify and address psychosocial factors that may influence symptoms and medical treatment outcome. The risk of transmission of HIV through human bites and the psychosocial impact of the disease on children are also discussed.

Keywords: *Human bite, HIV- positive girl, Paediatric ward, PEP*

Résumé

Croque est une méthode possible de transmission d'infection du VIH, bien que le risque d'une telle transmission est cru être faible. Les enfants infectés avec le VIH sont à risque des complications psychologiques comme le résultat des effets direct

ou indirect associés avec cette maladie. Nous rapportons le cas d'une fille de 11 ans ayant le VIH avec les symptômes cliniques, stage IV, qui avait des disputes multiple pendant l'admission. Pendant une des disputes, elle infligeait un croque profond chez une jeune garçon de 10 ans. La prophylaxie post-exposition au VIH (PPE) commençait 6 heures après le croquet et il restait VIH négative 12 mois plutard. Ce qui est spécial de ce cas est que l'incidence a eu lieu dans l'hôpital et le croque n'est pas expectant parmi les enfants de cette age. Dans la région du VIH/SIDA, c'est recommandé que les personnes qui donnent les soins des enfants faite attention de ce risque potentiel durant les interactions parmi les enfants. Il est essentiel pour les professionnels de santé d'avoir des connaissances suffisantes a propos PPE en ordre de réduire le risque de transmission du VIH dans d'autres régions similaires. En plus, Une approche multi disciplinaire pour le management des enfants vivant avec le VIH est importante en ordre d'identifier et adresser les facteurs psychosociaux qui peuvent influence les symptômes et le résultat de traitement médical. Le risque de transmission du VIH par les croques humain et l'impact psychosocial de la maladie sur ces enfants sont discutés.

Introduction

Biting is a possible mode of transmission of human immunodeficiency virus (HIV) infection [1-3], though the risk of such transmission is believed to be low. Children infected with HIV are at risk of psychological complications as a result of direct or indirect effects associated with the disease [4]. We report the case of an 11 year old HIV positive girl with clinical stage IV disease, who inflicted a deep bite injury on a fellow patient while on admission in a paediatric ward.

History

An 11 year old girl presented to the paediatric infectious disease clinic in the University College

Hospital, Ibadan in November 2005 with a 5year history of neck swelling and recurrent cough. She had been well until 5 years before presentation when she developed cough which was productive of yellowish sputum that had occasional blood stains. She was losing weight in spite of a good appetite. She also developed several painless swellings on the neck which increased progressively in size. There was occasional high-grade fever and recurrent bilateral purulent ear discharge. She had been receiving treatment from a traditional healer in her village who had excised some of the swellings. Both parents had earlier been diagnosed to have tuberculosis (TB) and HIV and they died in 2001.

She had no history of previous blood transfusions. Details of the pregnancy, birth, neonatal and immunization history were not known and the BCG vaccine scar was not seen. She was the only surviving child of her parents; her younger sibling had died at 2 years of age and had had recurrent illnesses. After the death of her parents, she dropped out of school and had to be taken into custody by her grandmother. She was brought by her uncle from the village to live with his family in the city a few weeks before she was admitted.

Physical examination

She was chronically ill-looking, but was neither pale nor jaundiced. Her weight and height were 25kg and 130cm respectively, which were low for her age. There were hypo-pigmented discoid macular lesions on the face and trunk and multiple scarification marks over the shoulder, back and abdomen. She had grade -2 digital clubbing, bilateral pre-auricular and cervical non-tender, firm and matted lymphadenopathy. She had oral thrush, scaly discoid scalp lesions and hyper-pigmented, moth-eaten appearance of the nails. The significant systemic findings were purulent otorrhoea, perforation of the tympanic membranes, crepitations in the lower lung zones and hepatomegaly of 7cm below the costal margin.

A presumptive diagnosis of WHO clinical stage 4 HIV infection and co-infection with disseminated TB, *Taenia capitis*, *Taenia ungiu*m and chronic suppurative otitis media was made and she was admitted into the children's ward. Her laboratory results were as follows: HIV antibody assay was positive by enzyme-linked immunosorbent assay (ELISA) and Western blot. The CD4+ cell count was 163cell/ μ l and viral load could not be done at that time. Her haematocrit was 33% and her white blood cell and platelet counts were within normal limits. Fine needle aspirate cytology (FNAC) of the

lymph node was suggestive of TB. The Erythrocyte sedimentation rate was 40 mm within the first hour by Westergreen method. Chest X-ray showed reticulo-nodular shadows in both lung fields but 3 sputum smears for acid-fast bacilli were negative. Liver Function Tests were only remarkable for hypoalbuminaemia of 2.1g/dl. Hepatitis B and hepatitis C screening tests were negative. Serum electrolytes, urea and creatinine were within normal limits. Culture of an ear swab yielded a heavy growth of *Pseudomonas aeruginosa* that was sensitive to ciprofloxacin.

Treatment and progress

For tuberculosis she received Rifampicin, Isoniazid, Ethambutol and Pyrazinamide. She also received Griseofulvin for her fungal hair and nail infections, ciprofloxacin and ear toileting for chronic suppurative otitis media. A week later, she was started on combination antiretroviral therapy (ART): Zidovudine, Lamivudine and Efavirenz.

The drugs were well tolerated and she made remarkable clinical progress. Four weeks after admission she was reported to have sustained an abrasion from a chair during a dispute with a child in the ward. On the 8th wk of admission, while waiting to complete the intensive phase of the anti-tuberculosis therapy, she had another dispute with another child aged 10years on whom she inflicted a deep bite wound on the hand. Her oral thrush and mouth ulcers had resolved and her CD4+ cell count at that time had increased to 256cells/ μ l while the viral load was 9745 copies/ml. She was evaluated by the child psychiatrist who noted that her mental state was normal and believed that having been provoked, her behaviour was motivated by the trauma and stress she had been exposed to. She was given psychotherapy.

Following this incident and having completed the intensive phase of the anti tuberculosis regimen, she was discharged home to continue on her medications. She has been on regular follow up since discharge and has remained well. On her last visit to the clinic in January 2007, her weight had increased to 33kg and the CD4+ count was 454cells/ μ l. She has since been enrolled in school and has not been reported to exhibit any biting or other aggressive behaviour.

The victim of the bite injury was a 10-year-old boy admitted in the same ward for pyomyositis of the left hand and forearm and compound fracture involving the left distal radius and ulna. The bite was inflicted on the dorsum of his right hand and the skin

was broken with resultant bleeding. The wound was washed immediately with soap and water and his parents were notified. He had earlier received tetanus toxoid and anti-tetanus serum as part of his initial management by the surgeons.

A baseline HIV antibody test obtained prior to commencement of the post-exposure prophylaxis (PEP) was non-reactive and the full blood count was within normal limits. Hepatitis B and C screenings were also negative. He was commenced on HIV PEP 6 hours after the bite using Zidovudine, Lamivudine and efavirenz according to the National guideline [5]. He tolerated the ART well and completed the 28 days regimen. HIV antibody assay by ELISA, Hepatitis B and C screening all remained negative 12 months after the bite.

Discussion

There is a potential for HIV to be transmitted via a human bite though bites are not considered to have a high risk of transmission [1-3]. Reviewing some of the reports in the literature, Vidmar *et al* [6] reported a case of HIV 1 transmission through a bite from a man with terminal stages of the disease in which the victim sero-converted after 54 days. Wahn *et al* [7] also reported the case of horizontal transmission of HIV infection between two siblings in which there was no exchange of blood and the bite did not break the skin. In this instance, since the biter also suffered some of the neurological complications of AIDS, there were speculations that the sibling could have been infected during other interactions and not as the result of the bite [8].

There have also been reports in which transmission did not occur following a bite received from an HIV-infected person in which the skin was broken. In one incident, a woman had been bitten deeply on the index finger while trying to prevent airway obstruction during a seizure in a man who turned out to be HIV positive. She reportedly received no chemoprophylaxis and 18 months after the incident she remained sero-negative [9]. Most of these cases had been reported either at home or outside the hospital setting. What is peculiar about this case report is that the bite took place in a Paediatric ward while the patient was being managed for advanced HIV disease.

Pretty *et al* [8] in their review of HIV transmission through human bites concluded that the likely risk of transmission increased if blood was present in the oral cavity or the bite broke the skin or where there was an associated previous injury. Courtenay and Avion [10] also observed in a separate

review that transmissions of HIV from human bites were from patients in late-stage disease. The HIV positive girl in this report had stage IV disease and her bite had broken the skin of the victim's hand. These factors put the victim at increased risk of transmission.

HIV PEP is a major intervention in preventing transmission of the disease in occupational and non-occupational exposures [11,12]. It is recommended that after an exposure to a known HIV-infected source as in the reported case, the case should be evaluated for PEP. It is a form of secondary HIV prevention that may reduce the incidence of HIV infections. There is less documented experience after bites but there is evidence supporting the value of HIV PEP in paediatrics [12]. The review by Pretty *et al* [8] had brought up an unanswered question as to how long a victim should be tested and followed up after a potentially infected bite. In relation to bite injuries it is difficult to determine whether the source was the saliva or the blood in the saliva which will both give different sero-conversion times.

Healthcare personnel, caregivers and others who interact with children should be aware of the potential risk of HIV transmission through bites. Close surveillance of children in care is important to reduce the incidence of bite injuries. Discriminatory attitudes and behaviours should however be discouraged among child-care providers regarding HIV-infected children and the transmission of HIV. Understanding the potential risks is important and appropriate safety practices should be in place to alleviate fears and afford optimal child-care environments for all children [13]. Health care workers should have sufficient knowledge about PEP in order to reduce the risk of HIV transmission in the hospital setting. It is important to also note that other diseases are also capable of being transmitted through human bites [14].

Psychosocial impact of HIV on children

With regards to the biting habits of children, bites are common during childhood and usually result from fights or aggressive play in toddlers and preschool age children when language is not fully developed. Biting occurs in a setting of frustration or aggressive play [15-17]. Toddlers have the highest bite rates while the incidence reduces by school age [18]. Therefore, biting is not usual among children in the age group of the girl in this report.

An issue worth examining is whether the aggressive behaviour in this 11 yr old was a psychological or emotional effect of advanced HIV disease. The child had experienced multiple stressors including loss of both parents and having to drop out of school and relocation to an unfamiliar environment. Many other factors constitute a source of stress in children living with HIV which include social stigma, loss and bereavement, having to drop out of school and frequent illness. The effects of stress on a child's mental state and the ability to cope are complex and could lead to psychological and emotional effects that may be neglected. Children may be grieved by loss of their loved ones but unlike adults they often do not feel the full impact of the loss simply because they may not immediately understand the finality of death. This leaves them at risk of growing up with unresolved negative emotions which are often expressed with anger and depression [19].

Management of children with HIV poses a challenge as a result of the interplay between psychosocial problems and other clinical manifestations of the disease. Apart from physical needs, the psychosocial problems of children orphaned by AIDS have to be identified and psychotherapy offered when necessary. Germann [20] in his study of the psychosocial impact of HIV/AIDS on children showed that orphans were more likely to internalize behaviour changes such as depression, anxiety and decreased self-esteem, rather than to exhibit acting out or sociopathic behaviour such as stealing, truancy, aggression and running away from home. Atwine *et al* [19] in their study on the psychological distress among AIDS orphans in Uganda, reported higher levels of anxiety, depression and anger in orphans in comparison to the non-orphans. From the Rakai district in Uganda, Sengendo *et al* [21] also described the psychosocial effects on children orphaned by HIV. They reported that many of the children were angry and depressed when they were adopted.

Further research is needed to document the psychosocial impacts and the effects of HIV infection on the mental health of children in Nigeria, especially the orphans. A multi disciplinary approach to the management of these children is also necessary in order to identify and address the psychosocial factors that may influence symptoms and medical treatment outcome.

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