

HUMAN BITE INJURIES IN THE ERA OF AIDS: A REVIEW

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The risk of human immunodeficiency virus infection (HIV) transmission following human bite is important to many groups of people. Meanwhile, the pandemic of HIV/AIDS continues unabated, with perhaps more than 3 million new infections last year alone. A review of the literature concerning human bite injuries and HIV was performed to examine current opinion regarding the transmission of HIV via this route. It is concluded that human bite contaminated with infected blood carry a small, but definite, risk of transmitting this important life-threatening disease.

Key words: HIV, Human bite, Risk

INTRODUCTION

Human bite wounds are underestimated and under treated. Since the recovery of HIV was accomplished from the saliva of infected persons, a great deal of attention has focused on the risk of transmitting this disease through contaminated human bites (1). Some of this interest has rightly focused on the risk of transmission among playmates by the bites of infected toddlers in day care centers (2). It is estimated that by end of the year 2003 close to 50 million people worldwide had become infected with HIV, the majority of them in sub-Saharan Africa. In the majority of cases, the disease is transmitted during intimate sexual relationships, parenteral exposure to contaminated blood or blood products and from mother to child during the perinatal period. Other methods of transmission are via donated organs or semen and the sharing of contaminated hypodermic needles.

The objective of this study was to review the evidence for transmission of HIV by human bites. The materials used were journal articles and edited conference papers that were identified by computer searching, bibliographies, and consultation with experts.

INCIDENCE OF HUMAN BITES

The true incidence of human bites might always remain unknown because most of the victims have minor injuries and never seek medical help. In the United States of America, where 1 % of all emergency consultations are due to bite from various animals, human bites are the third commonest source of the injuries (3). Only a few reports exist that strongly link HIV transmissions with human bite injuries (4, 5, 6, 7). To date, there is only one case in which scientists have proved conclusively by molecular techniques that the virus in the assailant and his victim were very closely related strains (8). Richman and Richman had evaluated the cumulative published data on the risk of HIV infection following human bites

and concluded that it is in the region of 0.3 – 0.5% (1).

SPECIAL GROUPS AT RISK

Pretty *et al* enumerated the groups that appear to be at special risk for transmission of HIV/AIDS (3). The first are those likely to be bitten as an occupational risk such as police officers and institutional staff, the victims and perpetrators of crimes involving biting, both attack and defense situation; and physicians who treat such patients. Bites commonly occur also in the young ages. Analysis of accident logs in child day care centers indicated that biting is common, especially among toddlers 13 to 30 months of age (2). Such bites may be inflicted during altercations or play with the attendant risk of HIV transmission if there is blood-to-blood contact involving HIV-positive child.

TRANSMISSION OF HIV

There had been reports in which HIV appeared to have been transmitted by a bite. Though HIV has been recovered from the saliva of AIDS patients, transmission through saliva in the absence of contaminated blood is considered a very unlikely event (4). HIV is infrequently isolated from saliva and it even appears that saliva has inhibitory effect on the infectivity of the virus. It has not been possible to prove that the bite of an AIDS patient alone could result in transmission of the disease in the cases available in the medical literature (5,6,7). These reports describe the presence of blood and severe injury with extensive torn and damaged tissue. In at least two of the cases above, there was proof of extensive tissue tearing and the presence of blood during the incidences, but corroborative scientific evidence was lacking (4, 6).

To examine the relative risk of transmission through bites and scratches, Tsoukas *et al* (8) studied 30 health workers who had been traumatized by an aggressive AIDS patient. This patient frequently bit others, his mouth full of saliva and blood. He was HIV antibody and antigen positive. HIV was recovered from his peripheral blood lymphocytes. After 2.5 years of follow-up, all traumatized personnel were clinically normal, no HIV was cultured from their blood, and all were HIV antibody and p24 antigen negative. They concluded that the risk of HIV transmission through this route must be very low. However, Brazilian scientists have presented evidence that confirm for the first time that the bite of a HIV-positive individual, which had broken the skin had actually transmitted the disease (9). The case involved a 31-year old male who was suffering from AIDS-related brain disorder who bit his mother on her hand during a seizure resulting in seroconversion several weeks later. DNA sequencing and phylogenetic analysis of the material from the proviral DNA acquired from both individuals indicated only an insignificant difference between the viral strains. These results support the epidemiological findings that the woman's infection was acquired from her infected son.

CONCLUSION

We conclude that the transmission of the HIV through human bite is biologically proven but remains unlikely epidemiologically. The presence of blood in the saliva may heighten the risk significantly. Exposure to HIV-contaminated blood from the bite of another human being is one of the multiple, unusual routes by which disease transmission could occur. Because the total numbers of

infected persons continues to rise, even more people will bear risk for infection through this route in future. Nonetheless, the consistent

conclusion of many studies and reviews is that there is no evidence for HIV transmission that could be directly attributed to exposure to uncontaminated saliva.

REFERENCES

1. Richman KM, Richman LS. The potential for transmission of human immunodeficiency virus through human bites. *J Acquir Immune Defic Syndr.* 1993; 6(4): 40-46.
2. Solomon HC, Elardo R. Biting in day care centres: incidence, prevention, and intervention. *J Paediatr Health Care.* 1991; 5(4): 191-196
3. Pretty IA, Anderson S, Sweet DJ. Human bite and the risk of human immunodeficiency virus transmission. *Amer J Forensic Med Pathol.* 1999; 20(3): 232-239
4. Vidmar L, Poljak M, Tomazic J, Seme K, Klaus I. Transmission of HIV-1 by human bite. *Lancet.* 1996; 347: 1762-1763
5. Liberti *et al.* Centers for Disease Control and Prevention. Blood to blood transmission of HIV via bite. Proceedings of the 11th International Conference on AIDS, Vancouver, British Columbia, 1996.
6. Padian N, Glass S. Transmission of HIV possibly associated with exposure of mucous membranes to contaminated blood. Centers for Disease Control and Prevention, National AIDS Clearing House, Rockville MD, *MMWR, Morb Mortal Wkly Rep.* 1997; 46: 27.
7. Anonymous. Notes and news: transmission of HIV by human bite. *Lancet.* 1987; 2: 522
8. Tsoukas CM, Hadji T, Shuster J, Theberge L, Feorino P, O'Shaughnessy M. *J Acquir Immune Defic Syndr.* 1988; 1(5): 505-507
9. Andreo SS, Barra LC, Costa LJ, Sucupira MA, Souza LI, Diaz RS. HIV-transmission by human bite. 9th Conference on Retroviruses and Opportunistic Infections, Seattle, Washington, 2002.