Can the tonsils influence oral HIV transmission?

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Current research demonstrates that the tonsils may possess the necessary factors to act as a transmission site for the spread of HIV. The related report by Moutsopoulos et al, “Tonsil Epithelial Factors May Influence Oropharyngeal Human Immunodeficiency Virus Transmission,” appears in the August issue of *The American Journal of Pathology*.

Human immunodeficiency virus (HIV) spreads mainly through sexual contact of mucosal surfaces, which the virus must cross to come in contact with underlying immune cells for infection to occur. While the oral mucosal surfaces are largely protected by their thickened exterior and the defensive proteins present in saliva, it is speculated that a low number of infections may occur via oral sexual contact. Researchers have questioned whether such transmission is facilitated by the tonsils, which contain high numbers of immune cells that may be easily accessible to HIV.

Researchers led by Dr. Sharon M. Wahl, of the National Institute of Dental and Craniofacial Research, NIH, examined this question by comparing the gene expression profiles of tonsils and oral gingiva. Although many of the genes examined showed similar expression patterns between the two oral sites, differences were observed. Notably, several genes related to immune functions, including HIV co-receptor CXCR4, displayed significantly higher expression in the tonsils while gingiva more strongly expressed keratin genes, which “thicken” the tissue and provide barrier protection.

Further, Dr. Wahl's group found that CXCR4 protein was expressed on gingiva, oral mucosa and tonsils, but the expression was strongest in tonsils, particularly in regions where immune surveillance is known to occur. Levels of additional molecules that may bind and entrap HIV, such as complement receptors and FcR, were also higher in the tonsils. However, when antiviral proteins were examined, lower levels of SLPI (secretory leukocyte protease inhibitor), defensins, and thrombospondin were found in the tonsils.

Altogether, Moutsopoulos et al's data "suggest that increased expression of molecules associated with HIV binding and entry coupled with decreased innate antiviral factors may render the tonsil a potential site for oral transmission." The decreased amount of keratin and antiviral proteins in the tonsils renders this tissue more permeable to foreign invaders, thus allowing tonsils to function in immune surveillance. However, it also renders the site more accessible to pathogens that infect immune cells. Future studies will elucidate how host vulnerability is influenced by tonsils during exposure to HIV.

Source: American Journal of Pathology

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