Gut microbiome changes may increase susceptibility to HIV-1

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Abstract

HIV is a lifelong illness that affects millions of people worldwide and in the US disproportionately affects men who have sex with men. Past research has shown that men who have sex with men have a distinct microbiome from other groups. Additionally, the lymphoid tissue invaded by HIV-1 after infection is partially regulated by the gut microbiome. However, little is known about the microbiome's role in HIV-1 susceptibility and progression. In a recent study, researchers found bacteria that enhance inflammation were more abundant in the gut as well as a decrease in important commensal bacteria that are protective, months before HIV-1 infection. Increased prevalence of certain *Prevotella* species and decreased prevalence of *Bacteroides* species in particular could result in inflammation. As other research has shown, some species of *Prevotella* and *Bacteroides* can play pro- and anti-inflammatory roles, respectively. The gut microbial shifts observed here support those roles, as they correspond with elevated inflammatory molecules prior to HIV-1 infection, suggesting systemic inflammation. Even among men infected with HIV-1, microbiome differences correlated with risk of advancing to AIDS. While more research is needed, these results suggest that disturbances in the gut microbiome before HIV-1 infection increase gastrointestinal inflammation and that together those factors may increase vulnerability to HIV-1 infection.