Research Profile: The widespread availability and efficacy of antiretroviral therapy has led to a dramatic drop in the mortality rate of HIV-infected patients. With increased survival of these patients, there has been a significant shift in the causes of morbidity and mortality from AIDS-defining (infections and AIDS malignancies) to non-AIDS-defining conditions, principally cardiovascular diseases, liver-related complications, and non-AIDS malignancies. The pathogenesis of these non-AIDS complications is incompletely understood. It likely involves patient factors (over-representation of "traditional" risk factors, direct and indirect effects of HIV infection and HIV-associated inflammation and immune activation, and effects of antiretroviral therapy. Most of my work has been focused on the study of rates and determinants of chronic non-AIDS complications among the aging HIV population. I initially studied rates and risk factors of non-AIDS malignancies, then analyzed the role of antiretroviral drugs on the risk of atherosclerosis cardiovascular diseases in HIV patient, and finally the rates and mechanisms of bone fragility in HIV. My work has contributed to a better understanding of the mechanisms of chronic complications of HIV.

Chronic hepatitis C is also associated with significantly elevated fracture risk. While possible contributors of the increased fracture risk among HCV-infected subjects is behavioral factors (such as substance abuse and intoxication leading to traumas) or an overrepresentation of “traditional” fracture risk factors (including tobacco use, alcohol consumption, and corticosteroid use) in these populations. Using a novel assessment of bone strength from bone mineral density (DXA) scans called Trabecular Bone Score, we have recently showed that unlike HIV, HCV imparts architectural changes beyond what can be assessed by planar BMD that lead to increased bone fragility. Our current focus is to evaluate longitudinal changes in bone density and fracture risk in a cohort of participants infected with HIV, HCV or co-infected with HIV and HCV.

Techniques: Trabecular bone score (TBS) is a novel measurement of bone microarchitecture from DXA images. In TBS, numbers and amplitudes of pixel-to-pixel gray-level variations of a projection of a planar BMD image is used to infer the 3-dimensional density of trabecular structure using mathematical “experimental variograms”. A high TBS value is associated with better bone structure, while low TBS values indicate worse bone structure. We have calculated TBS to evaluate the effects of HIV and HCV on fracture risk.

Selected Recent Publications:


