Challenges to current and future bone health in young women living with HIV

See Articles page e694

The growing ageing population across the globe presents challenges to individuals, communities, and health-care systems. The fastest rise in adults aged 65 years and older over coming decades is predicted to be in the African continent.[1] Alongside the growing ageing population will be a consequent rise in non-communicable chronic diseases of ageing, such as musculoskeletal conditions. Musculoskeletal diseases result in more lives lost because of disability than cancer and cardiac disease combined and are present in a third of multimorbidity cases worldwide.[2] One of the most prevalent musculoskeletal diseases is osteoporosis; osteoporotic fractures cause substantial morbidity and mortality and are predicted to double in low-income and middle-income countries (LMICs) by 2050. Although in higher-income countries there are comprehensive data regarding risk factors for fracture, there are few data in sub-Saharan Africa, and research shows it would be naive to assume risk factors necessarily translate to LMIC settings.[3]

In sub-Saharan Africa, HIV prevalence is high and with the success of antiretroviral treatment, HIV infection is now considered a chronic disease of ageing. Furthermore, evidence shows HIV and associated treatment present several challenges to the skeleton at different stages of the lifecourse.[4-8] The acquisition and maintenance of peak bone mass through growth and young adulthood is crucial for prevention of future fracture.[9] Any change in environment that might affect growth and bone acquisition will affect the accrual of peak bone mass. The use of antiretroviral treatments, often initiated in the growing and reproductive years, could therefore be a risk factor for osteoporosis and fracture risk either through prevention or acquisition of peak bone mass, or by causing premenopausal bone loss.[5] The second challenge during reproductive years is the use of hormonal contraceptives, particularly those that affect oestrogen status, such as the injectable contraceptive depo medroxyprogesterone acetate (DMPA), which is a popular choice in sub-Saharan Africa. Therefore, given the growing evidence of bone loss on initiation of HIV and increasing use of injectable contraceptives, in this issue of *The Lancet Global Health* Flavia Kiweewa Matovu and colleagues,[10] determine the combined effect of initiation of ART treatment with the use of DPMA. In this important work, the use of tenovovir disoproxil fumate (TDF) and intramuscular depo medroxyprogesterone acetate (DPMA-IM) in women living with HIV was explored. The authors studied change in bone density (a surrogate for fracture risk) over a 24 month period. The greatest loss of bone in women taking TDF was seen over the first 12 months of treatment. Losses were observed at the lumbar spine, femoral neck, and total hip, common sites of osteoporotic fracture. In women taking TDF and DMPA-IM, there was double the loss of bone compared with women taking TDF without DMPA-IM. Importantly, with losses up to 4%, the group taking both TDF and DMPA-IM lost more bone than during 1 year of menopause, usually 1–2% per annum; bone loss in the TDF-only group was similar to menopause. These data are the first to test, in a randomised controlled trial, the dual effect of TDF and DMPA-IM initiation in young adult women. The consequences of these losses at or around the time of peak bone mass could have substantial implications for the bone health of women living with HIV in later years. If women living with HIV enter menopause with a deficit in bone and then lose more bone mass as oestrogen status drops, it is highly likely that they will be at greater risk of fragility fracture in later life. Another important consideration at this stage of the life course are the effects of pregnancy and lactation. Nabwire and colleagues[7] showed that in Ugandan women living with HIV who initiated TDF during pregnancy, bone loss during lactation was exacerbated compared with controls, and the usual recovery of bone after weaning did not occur.[11] Thus lactation presents a third challenge to the skeleton.

Together, the growing body of evidence from sub-Saharan Africa in young adult women points to a triple challenge for bone health. It is imperative, as pointed out by the authors,[10] that alternative, acceptable solutions for bone-sparing contraceptives are found in these communities to prevent or minimise the impact of treatments on health in later life. Furthermore, data are required to link the implications of these and other

findings on fracture risk in later life. This will allow affordable solutions for prevention of osteoporosis and fractures in women living with HIV over coming years.

I declare no competing interests.

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