Individual Research Project Presentations Day 10th June 2024, Kent and Medway Medical School.

How can fracture risk be minimised in people living with HIV in the United Kingdom? A systematic review.

Student[a]**:** Yuta Nyemitei-Addo | **Supervisor**[b]**:** Dr Pamela Leventis

Abstract

Background: The extended life expectancy of people living with human immunodeficiency virus (PLWH), has increased the risk of age-related non-communicable comorbidities, such as osteopenia, osteoporosis, and fragility fractures (FFs). The risk arises from the virus itself, antiretroviral therapy (ART) and traditional risk factors of low bone mineral density (BMD) which may be more widespread in this population. BMD loss in PLWH begins a decade earlier than the general population, therefore earlier assessment and intervention is warranted. There is a lack of national consensus on the approach to prevent FFs and optimise bone health in PLWH within the UK. This systematic review evaluated the evidence for interventions to minimise fracture risk in PLWH through bone health assessment, risk stratification, osteoprophylaxis and osteotherapy.

Methods: MEDLINE, EMBASE and Cochrane library were searched in English language. Eligibility criteria included PLWH over the age of 16 with no geographical restrictions. Studies were included if they fulfilled one or more of the predefined themes: assessment and screening, osteoprophylaxis or osteotherapeutic interventions. Pre-existing guidelines from reputable professional bodies were also included. One reviewer was involved in data extraction, synthesis, quality assessment and analysis. Data was narratively synthesised.

Results: Out of 6233 studies identified, 56 studies and 6 guidelines were included in this review. 4 studies fulfilled criteria for the 'assessment and screening' theme, 30 fulfilled 'bone prophylaxis' objectives and 22 studies evaluated 'treatment.' 41565 PLWH were included, of whom were primarily Caucasian males. The fracture risk assessment tool (FRAX) underestimated fracture risk in PLWH. Predictive accuracy increased when HIV was included as a secondary risk factor for osteoporosis, or by the addition of BMD evaluation by Dual-energy X-ray absorptiometry (DXA). Various interventions, such as testosterone replacement, vitamin D supplementation and switching to bone-protective ART regimens were effective in attenuating BMD loss in PLWH. In terms of osteotherapeutic interventions, multimodal exercise programmes, bisphosphonates, and denosumab were beneficial in improving BMD.

Conclusions: This review recommends that all PLWH should have lifestyle interventions initiated and considerations around ART prescribed at the point HIV diagnosis or at ART

initiation. After identification of PLWH high risk of FF using FRAX (with HIV added as a secondary cause of osteoporosis) or in all PLWH ≥50, BMD evaluation by DXA is indicated, and considerations of osteotherapy with regular review is advised. Further studies should be conducted considering the effects of osteoprophylaxis and osteotherapies on FF incidence in PLWH.

Keywords: HIV | Bone health | Bone mineral density | Osteoporosis | Fragility fracture

[a] 4th Year Medical Student, Kent and Medway Medical School, Canterbury, United Kingdom

[b] Consultant Rheumatologist, Maidstone and Tunbridge Wells NHS Trust; Academic Lead for Year 3, Kent and Medway Medical School, Canterbury, United Kingdom

Main contact email: y.nyemiteiaddo3@kmms.ac.uk