Bone mineral density optimisation in adults with perinatally acquired HIV infection in routine care

Thomas J Pasvol[1]*, Fred Fyles[1], Caroline Foster[2] and Sarah Fidler[1]

[1] Imperial College London, UK
[2] Imperial College Healthcare NHS Trust, London, UK

Puberty is a crucial time for bone development with a doubling of skeletal mass and at least 90% of bone mineral deposition accrued by the end of adolescence [1]. Following puberty, bone mineral deposition continues with peak bone mass typically obtained around the age of 25 years [2]. The accrual of bone mass during adolescence is a major determinant of peak bone mass [1] and low peak bone mass is associated with osteoporosis later in life [3].

Low bone mineral density (BMD) has been reported in children living with perinatally acquired HIV infection (PaHIV) [4]. However, adults with PaHIV are a unique group in whom the effects of lifelong HIV infection and antiretroviral therapy (ART) on BMD remains unknown.

We report on BMD and factors associated with reductions in BMD for all PaHIV-positive adults who attended a London clinic between May 2014 and October 2016.

The number of PaHIV-positive young adults included was 158. Median age was 22 (IQR, 19–25) years. Ninety-one (57.6%) were female and 149 (94.3%) were of non-white (black, mixed-race, Asian or other) ethnicity. Latest median CD4 count was 591 cells/mm^3 (IQR, 425–768). One hundred and fifty (94.9%) patients were on ART of whom 121 (80.7%) had a plasma HIV viral load <50 copies/mL at their last visit. Thirty (19.0%) patients were current or ex-smokers; either cigarettes and/or cannabis. Four out of 91 (4.4%) patients were underweight (BMI <18.5). At least 94 (59.5%) patients had been exposed to tenofovir disoproxil fumarate (TDF) in their lifetime. Three (3.3%) female patients reported Depo-Provera use. Median 25-hdroxyvitamin D (25-OHD) was 12.8 ng/ml (IQR, 9.6–20.4). Out of 107 patients, 77 (74.8%) were currently deficient in 25-OHD (<20 ng/ml).

Sixteen patients received dual energy x-ray absorptiometry scans assessing lumbar spine and femoral neck BMD. Fifteen (94%) patients were scanned for clinical indicators; one (6%) during a clinical trial. Two (12.5%) patients had lumbar spine or femoral Z-scores <–2.5. Six (37.5%) patients had lumbar spine or femoral Z-scores between -1 and -2.

Sudjaritruk *et al.* recently reported low BMD in a Thai and Indonesian cohort of PaHIV-positive adolescents aged 10–18 years [4]. In agreement with Sudjaritruk *et al.* we observed a high prevalence of reductions in BMD. We observed a higher than expected prevalence of factors associated with adverse bone health, namely vitamin D deficiency; a key difference being that the majority of our cohort were individuals of African or mixed-race origin living in the UK, with significantly less exposure to sunlight.

Long-term outcomes with regard to osteoporosis and risk of fracture in adults with PaHIV remain unknown. However, higher than expected prevalence of reductions in BMD suggest that optimisation of bone health should be made a priority in this group.

Tenofovir alafenamide (TAF) is now a recommended alternative to TDF and early data suggest more favourable bone outcomes [5]. The revised NHS England clinical commissioning policy for the use of TAF highlights groups that are most at risk of bone disease, including adolescents and young adults under 25 years of age [2]. There is an increasing body of evidence supporting switching from TDF to TAF to maximise peak bone mass for this age group.

*Corresponding author: Thomas Pasvol, Clinical Trials Unit, Winston Churchill Wing, St Mary's Hospital, London, W2 1NY
Email: thomas.pasvol@nhs.net

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