Older urban Black South African women are increasingly at risk of low bone mass and high bone turnover

Marlena Kruger¹, Salome Kruger², Hattie Wright³, Willem Schutte² & Iolanthe Kruger²

South African studies indicated that urban Black and White women have similar bone turnover. However, urban Black women had low bone mass and greater exposure to lifestyle risk factors for bone disease. The purpose of this prospective study was to assess changes in bone turnover, parathyroid hormone (PTH) levels, bone health (forearm, hip and lumbar spine bone mineral density) in urban black South African women over 3 years. Black, urban postmenopausal women (n=144, >50 years) from the North-West Province, South Africa were recruited. Forearm bone density measurements (BMDDTX) were performed at the distal and ultra-distal sites in the non-dominant arm (DTX-200Osteometer MediTech). Conventional central bone density (BMDDXA) scans of the lumbar spine (L1-L4) and hip were performed using a Hologic Discovery-W. Blood concentrations of C-Telopeptide of Type I collagen (CTx), PTH and 25 (OH) D3 were assessed (Roche Elecsys) and physical activity (PA) was assessed using a validated questionnaire. Over the three years CTx and PTH levels increased (P<0.001), and 25 (OH) D3 levels reduced (P<0.001), while hip bone density decreased significantly (P<0.001) and had a medium effect (r=0.38). In multiple regression the predictors of % change in PTH were CTx and PTH at baseline (negative association), and height, PA score and C-reactive protein (CRP) at baseline (positive association). CTx and magnesium intake at baseline (negative associations) predicted % CTx change. Age and PA score (negative) and CRP (positive association) were
significant predictors of % change in left hip BMD. Age and PA score were also negatively associated with % change in forearm BMD. Higher CRP at baseline was associated with greater % changes in PTH and hip BMD. In general, inflammation contributed to greater decreases in BMD and increased bone turnover, whereas a higher physical activity score in 2010 was associated with smaller decreases in BMD among these women.