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Osteoporosis following heart transplantation and immunosuppressive therapy

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Abstract

Heart transplantation (HT) remains the ultimate final therapy for patients with end-stage heart failure, who despite optimal medical and surgical treatments exhibit severe symptoms. To prevent rejection of the transplanted organ, HT patients require life-long immunosuppressive therapy. The goal of the immunosuppression is to minimise the risk of immune-mediated graft rejection, while avoiding clinical side-effects. Current immunosuppressive agents have yielded good survival outcome, however, complications of the immunosuppressive therapy, such as impaired bone strength and increased fracture risk, are common among HT patients rendering increased morbidity and mortality rates. The main aim of the present review was to summarise current knowledge on bone strength impairment after HT and concomitant immunosuppressive therapy.

Keywords

Heart transplantation; bone strength; osteoporosis; bone mineral density; corticosteroids; bone fractures.

Abbreviations

BMD (bone mineral density), BMI (body mass index), BMU (basic multicellular unit), CAV (cardiac allograft vasculopathy), CKD (chronic kidney disease), CS (corticosteroids), DXA (dual energy x-ray absorptiometry), FASL (FAS ligand), FRAX (Fracture Risk Assessment Tool), GFR (glomerular filtration rate), HRT (hormone replacement therapy), HT (heart transplantation), ISHLT (The International Society for Heart and Lung Transplantation), KDOQI (Kidney Disease Outcomes Quality Initiative, mTOR (mammalian target of rapamycin), N BP (nitrogen containing bisphosphonates), NN BP (non-nitrogen containing bisphosphonates), OPG (osteoprotegerin), PTH (parathyroid hormone), RANK (receptor for activation of nuclear factor-κB), RANKL (receptor for activation of nuclear factor-κB ligand), SD (standard deviations).