BONE TURNOVER, BONE MASS, SIZE AND VOLUMETRIC DENSITY DIFFERENCES BETWEEN YOUNG ADULT AND SENILE OSTEOPOROSIS

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Osteoporosis predominantly affects postmenopausal women, but low bone mineral density (BMD) also occurs in men and younger women. While most young people with osteoporosis have an identifiable cause, others have an idiopathic form. To characterize the physiophatology of reduced bone mass in young adults, we measured bone turnover markers (BALP and serum CTX), areal BMD (aBMD), bone volume and volumetric BMD (vBMD) by DXA in 70 males (32-49 yrs) and 30 premenopausal females with low bone mass (<-2 SD), in 100 age-matched healthy subjects, in 150 elderly men (59-85 yrs) and 150 postmenopausal women (55-70 yrs). Weight was reduced in young adult and elderly osteoporotic subjects with respect to controls. BALP was within the normal range in young and elderly males but was significantly decreased in young adult than in elderly osteoporotic men. CTX levels appeared significantly lower in young adult than in elderly osteoporotic men, while did not differ from those in controls. Young women with osteoporosis had reduced BALP and CTX levels than healthy and osteoporotic postmenopausal women. No major differences were observed in PTH and 25 hydroxy-vitamin D even though a trend for decreased levels was observed in elderly subjects. Smaller aBMD and vBMD were observed between young adult osteoporotic males and controls as well as between elderly osteoporotic and non osteoporotic men, at femoral and lumbar sites. When we considered bone size, only the spine bone volume was reduced in young osteoporotics compared with controls. Moreover, the spine bone volume was significantly reduced comparing the young osteoporotic males with the healthy elderly subjects. A similar deficit in vBMD and bone size was observed in premenopausal women with osteoporosis as compared to controls and in postmenopausal osteoporotic women compared to healthy osteoporotic women. The pathogenesis of low bone mass in young men and women may be heterogeneous, but these results suggest that a low bone turnover with an osteoblast dysfunction may be responsible of these forms of osteoporosis in both sexes. Moreover, the differences in bone size between elderly osteoporotic and non osteoporotic subjects may be accentuated in young adult idiopathic osteoporosis as compared to controls.