

Abstract

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Bone quality markers: pentosidine, homocysteine, and MTHFR polymorphism

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BACKGROUND: Bone quality is thought to encompass the structural and material properties of bone that are affected by the turnover rate. Evidence has accumulated that collagen cross-links play important roles in bone strength.

OBJECTIVE: We have demonstrated that the quantitative and qualitative deterioration of lysyl oxidase control and non enzymatic cross-links (advanced glycation end products, AGEs, pentosidine) of collagen in patients with osteoporotic femoral neck fracture might be affected by hyperhomocysteinemia, oxidative stress, and vitamin B6 insufficiency.

RESULTS: Recently, Shiraki et al. demonstrated that a functional polymorphism in methylenetetrahydrofolate reductase (MTHFR) polymorphism, T allele (C677T), may be a risk factor for future fracture in addition to the traditional risk factors. Further, we reported that a higher urinary pentosidine level was an independent risk factor for vertebral fracture in a 5-year prospective study involving Japanese women.

CONCLUSION: If confirmed in large, prospective trials, measurements of serum homocysteine and serum or urine levels of pentosidine might be characterized as markers reflecting bone collagen deterioration.

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