The Predictive Value Of Urinary Deoxypyridinoline As A Marker For Osteoporosis In Postmenopausal Women

Thesis
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SUMMARY

Osteoporosis is a major worldwide public health problem, and postmenopausal osteoporosis constitutes a major part of the problem. The population most likely to be affected, the elderly, is expanding at a rate of nearly 20% per decade. Consequently, one can predict that the number of osteoporosis-associated fractures per year will be more than double by the middle of the 21st century.

The recent development of non-invasive techniques to measure bone mass and bone turnover represents a major advance in the diagnosis and management of osteoporosis. These markers are, in principle, either enzymes involved in bone remodeling, or bone matrix components released into the circulation during formation or resorption.

The most recent bone resorption marker is deoxypyridinoline which is one of the pyridinium cross-links that is present in type I collagen of bone. Dpd is formed by the enzymatic action of lysyl oxidase on the amino acid lysine. Dpd is released into the circulation during the bone resorption process, excreted unmetabolized in urine and unaffected by diet which makes it suitable for assessing and reflecting bone resorption.

The aim of this work was to assess the urinary deoxypyridinoline level as a bone turnover marker reflecting bone resorption in postmenopausal women. 58 subjects with age ranged 45-70 years old, were included in this study. CT densitometry (BMD) was performed for every subject. According to BMD, subjects were classified into:-

1. ***Group I (Control group)*:** 16 with BMD up to 0.5 SD below mean.

2. ***Group II (Mild cases)*****:** 12 with BMD 0.6:1.0 SD below mean.
3. ***Group III (Moderate cases*****):** 16 subjects with BMD 1.1:2 SD below mean.
4. ***Group IV (Severe cases*****):** 14 subjects with BMD more than 2 SD below mean.

Serum samples from all subjects were subjected to the following laboratory investigations; calcium, phosphorus, ALP, ALT and creatinine level estimation. Urinary Dpd and creatinine levels were estimated in all urine samples.

This study showed that:

1. The mean urinary Dpd level was significantly higher in the postmenopausal osteoporotics when compared to the control group.
2. The mean urinary Dpd level was significantly higher in patients with severe osteoporosis when compared to patients with mild and moderate osteoporosis. Also, mean urinary Dpd level was significantly higher in patients with moderate osteoporosis versus the patients with mild osteoporosis. These results were in accordance with the results of BMD.
3. There was no significant difference in mean serum levels of calcium, phosphorus, ALP, ALT and creatinine between postmenopausal osteoporotic patients when compared to control group.

Measurement of urinary Dpd could serve as a routine non-invasive mean in determination of early osteoporosis, grading of disease severity, detection of accelerated bone loss and prediction of risk of bone fractures.