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### Adequate Serum Copper Concentration Could Improve Bone Density, Postpone Bone Loss and Protect Osteoporosis in Women

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#### Abstract:

Background: To determine the protective impact of efficient serum copper concentration on BMD in women and to assess its impression on bone. Methods: six hundred healthy women through a national project in Iran, IMOS, were selected via a cluster random sampling and enrolled the study. They were divided to pre menopausal (404/600, 67.7% of total) and post menopausal (190/600, 32% of total) groups. BMD was measured by biphotonic absorptimetry DEXA for hip and lumbar spine. Morning serum copper concentration was determined by atomic absorption spectrometry. Results: Mean age was  $40.92 \pm 14.8$  yr. Mean serum copper concentration =  $105.85 \pm 40.15$   $\mu$ g/dl and mean BMI =  $27.13 \pm 4.81$  kg/m<sup>2</sup>. Totally 2.4% was smoking, 5% had regular physical activities three times a week and 17.5% was copper deficient. Prevalence of Osteoporosis in postmenopausal women was 12.9% in copper deficient persons vs. 11.3% in normal serum copper ones. No significant difference found according to serum copper concentration associated with BMI, age and vita-min D. Spine BMD revealed a significant correlation with serum copper content. ( $P = 0.001$ ). This correlation also existed for Total hip ( $P < 0.05$ ). Premenopausal women with serum copper level above 105  $\mu$ g/dl revealed a significant difference in hip BMD compared to whom with less copper concentration.  $1.02 \pm 0.13$  kg/m<sup>2</sup> vs.  $0.97 \pm 0.13$  kg/m<sup>2</sup> ( $P = 0.001$ ). Copper had an independent role on determining hip BMD in pre menopausal women ( $P = 0.001$ ). Conclusion: copper has an independent role on bone density in all healthy women. It could have an adjourning factor for bone loss as well as a protective agent for osteoporosis.

#### Keywords:

Serum copper

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