ONLINE ISSN : 1880-1404
PRINT ISSN : 0916-717X

Biomedical Research on Trace Elements
Vol. 18 (2007) , No. 3 269-272

[PDF (521K)] [References]

Comparison of Bone Strength and Mineral Concentrations between Male and Female Minko Rats

Ryuji Takeda[1)2)], Takashi Nakamura[1)], Masayo Imanishi[2)], Takahisa Takeda[2)] and Mieko Kimura[2)]

1) Graduate School of Medicine, Kyoto University
2) Takeda Research Institute of Life Science and Preventive medicine

(Received: August 31, 2006)
(Accepted: February 16, 2007)

Abstract:
Osteoporosis is a major public health problem in Japan. Although bone mineral density is often used as an indicator to evaluate bone fragility, it isn't always reflected in bone strength. We have maintained spontaneously obese rats with abnormal lipid metabolism selected among Wistar rat (Minko rat). In this study, we reported the difference of bone strength and bone mineral concentrations between male and female Minko rats. The bone strength was tested by the three-point bending method. Mineral (Mg, Ca, P, Na, S, K, Zn, Sr, Fe) concentrations were measured by ICP-AES. Mechanical study indicated that the bone strength of male rats was significantly high compared to that of female rats. On the other hand, Ca, P, Mg, Na, Zn, Fe and Sr concentrations in bone of male rats were significantly low compared to that of female rats, and S and K concentrations in male rats were high compared to that of female rats. There was significantly positive correlation between mineral concentrations in bone of female rats as follows; Ca and P, Ca and Mg, Ca and Na, P and Mg, P and Na, Mg and Na, S and K. There was significantly positive correlation between mineral concentrations in bone of male rats as follows; Ca and P, Ca and Mg, Ca and Na, P and Mg, P and S, P and Sr, Mg and Na. A significant positive correlation between stiffness and Zn concentration in bone of female rats was found. In male and female rats, there was no correlation between bone strength and Ca or P. These results suggest that bone strength is not always related to the concentrations of Ca or P, principal minerals in bone.

Key words: mineral concentration, rats, bone strength, ICP-AES, correlation

To cite this article:

Ryuji Takeda, Takashi Nakamura, Masayo Imanishi, Takahisa Takeda and Mieko Kimura, “Comparison of Bone Strength and Mineral Concentrations between Male and Female Minko Rats”, Biomedical Research on Trace Elements, Vol. **18**, pp.269-272 (2007) .

JOI JST.JSTAGE/brte/18.269