Abstract

Cytokine Production, Ferritin Levels and Bone Mineral Density in Healthy Postmenopausal Women [†]

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[†] Presented at the 2018 Nutrition Society of New Zealand Annual Conference, Auckland, New Zealand, 28–30 November 2018.

Background: Cytokines, chemokines and CRP are known inflammatory markers. However, cytokines such as interleukin (IL-1β), (IL-6) and tumour necrosis factor (TNF-α) have been reported to interfere with both the bone resorption and bone formation process. IL-10 but not IL-33 has been linked to lower ferritin levels and anemia. In this study, we hypothesized that cytokine levels will be higher in women with low bone mineral density (BMD) due to the actions of elevated levels of these pro-inflammatory cytokines in inducing osteoclast formation during senescence.

Methods: In this cross-sectional study, eighty-six postmenopausal women aged 54–81 years were enrolled for the study. BMD of the hip, lumbar spine and femoral neck were assessed using dual-energy X-ray absorptiometry (DXA). Cytokine and ferritin levels were obtained from the plasma of fasting blood samples. Cytokines and ferritin levels were measured using LEGENDplex™ Multi-Analyte Flow Assay and electrochemiluminescence immunoassay "ECLIA" respectively.

Results: Cytokines (IFNa2, IFN-y, IL-12p70, IL-33) and MCP-1 levels were significantly higher in the osteoporotic than the osteopenic and/or normal groups. Meanwhile CRP levels were significantly lower in women with osteoporosis (p = 0.04) than those with osteopenia and normal groups. Hip BMD values were significantly lower in women with high/detectable values of IL-1β (p = 0.02) and IL-6 (p = 0.03) compared to women with non-detectable values. Similarly, women with high/detectable values of IL-1β had significantly lower spine BMD than those with non-detectable values of IL-1β (p = 0.03). In addition, ferritin levels of women with high/detectable values of IL-10 (p = 0.01) and IL-33 (p = 0.02) were significantly lower than those with non-detectable values. There was no association between TNF-α and BMDs of the hip and lumbar spine.

Conclusions: High levels of cytokines and MCP-1 in apparently healthy postmenopausal women is associated with bone health issues. In addition, increase in levels of IL-10 and IL-33 may be associated with anemia in this age group.

Supplementary Materials: The poster is available online at www.mdpi.com/2504-3900/8/1/28/s1.