The Role of serum expression levels of Microrna-21 on Bone Mineral Density in Hypostrogenic Postmenopausal Women with Osteoporosis: study on level of RANKL, OPG, TGFβ-1, Sclerostin, RANKL/OPG Ratio, and Physical Activity

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ABSTRACT
Background: MiR-21 is known to play a role in osteoclast proliferation and differentiation, but the role of serum miR-21 expression in osteoporosis remains unclear. Previous research found that serum miR-21 expression was positively correlated with bone mineral density in postmenopausal osteoporosis patients, but other factors involved in postmenopausal osteoporosis still unknown. This study aimed to determine the role of serum miR-21 expression, concentration of RANKL, OPG, TGF-β1, sclerostin and serum calcium, RANKL/OPG ratio, and physical activity on bone mineral density of spine in hypoestrogenic postmenopausal women with osteoporosis (PMOP) compared with no osteoporosis (PMNOP), with point of interest on the expression of serum miR-21. Methods: this study was conducted by comparative cross-sectional design. The subjects were divided into 2 groups of PMOP and PMNOP. We used an absolute quantification real-time PCR method to determine serum miR-21 expressions level. Results: Median of serum miR-21 expression at the PMOP group was significantly higher compared to PMNOP group (p = 0,001). Serum miR-21 expression, RANKL, RANKL/OPG ratio, and physical activity were significantly correlated with BMD values in the PMOP group. Moderate physical activity was significantly negatively correlated with serum miR-21 expression. We also obtained a linear regression equation BMD = 1,373-0,085*Ln.miR-21-0,176*Log10.RANKL (R2 = 52,5%). Conclusion: serum miR-21 expression in PMOP was higher compared with PMNOP. Serum miR-21 expression proved to have a negative effect on spinal BMD values in hypoestrogenic postmenopausal women with osteoporosis of 8,5%. Obtained equation of BMD = 1,373-0,085*Ln.miR-21-0,176*Log10.RANKL can explain the value of spinal BMD by 52,5%.