

Peran ekspresi microrna-21 terhadap densitas mineral tulang pada perempuan osteoporosis pascamenopause hipoestrogenik: kajian terhadap konsentrasi rankl, opg, tgf- ? 1, sklerostin, rasio rankl/opg dan aktivitas fisis = 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, tgf ? -1, sclerostin, rankl/opg ratio and physical activity

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Abstrak

<b>ABSTRAK</b><br>

MiR-21 diketahui berperan dalam proliferasi dan diferensiasi osteoklas, namun peran ekspresi miR-21 serum pada osteoporosis masih belum jelas. Penelitian sebelumnya mendapatkan bahwa ekspresi miR-21 serum berkorelasi positif dengan densitas mineral tulang pada penderita osteoporosis pascamenopause, tetapi penelitian tersebut tidak menganalisis faktor-faktor lainnya yang terlibat dalam osteoporosis pascamenopause. Penelitian ini bertujuan untuk mengetahui peran ekspresi miR-21 serum, konsentrasi RANKL, OPG, TGF- ? 1, sklerostin, rasio RANKL/OPG, kalsium serum dan aktivitas fisis terhadap densitas mineral tulang belakang pada perempuan pascamenopause hipoestrogenik dengan osteoporosis dibandingkan dengan tanpa osteoporosis, dengan point of interest pada ekspresi miR-21 serum. Penelitian ini dilakukan dengan desain uji potong lintang komparatif, di RSUD Ulin Banjarmasin, pada bulan Agustus 2015 sampai Juli 2016. Subjek dibagi menjadi 2 kelompok yaitu perempuan pascamenopause hipoestrogenik dengan osteoporosis dan tanpa osteoporosis. Pengambilan sampel dilakukan dengan metode consecutive. Pemeriksaan ekspresi miR-21 serum menggunakan metode absolute quantification real-time PCR. Analisis statistik menggunakan uji korelasi Spearman, Mann-Whitney U test dan regresi linear berganda. Subjek dibagi menjadi 2 kelompok yaitu perempuan pascamenopause hipoestrogenik dengan osteoporosis PMOP dan tanpa osteoporosis PMNOP masing-masing sebanyak 60 subjek. Median ekspresi miR-21 serum pada PMOP lebih tinggi secara bermakna dibandingkan dengan PMNOP  $p = 0,001$ . Ekspresi miR-21 serum, RANKL, rasio RANKL/OPG dan aktivitas fisis berkorelasi bermakna dengan nilai BMD pada PMOP. Aktivitas fisis sedang berkorelasi negatif bermakna dengan ekspresi miR-21 serum pada PMOP dan PMNOP. Analisis regresi linear berganda menggunakan metode backward stepwise mendapatkan persamaan regresi linear:  $BMD = 1,373 - 0,085 \text{ Ln.miR-21} - 0,176 \text{ Log } 10.RANKL$   $R^2 = 52,5$ . Simpulan. Ekspresi miR-21 serum pada perempuan pascamenopause hipoestrogenik dengan osteoporosis terbukti lebih tinggi dibandingkan dengan tanpa osteoporosis. Ekspresi miR-21 serum terbukti memberikan pengaruh negatif terhadap nilai BMD tulang belakang pada perempuan pascamenopause hipoestrogenik dengan osteoporosis sebesar 8,5, dengan persamaan regresi linear  $BMD = 1,373 - 0,085 \text{ Ln.miR-21} - 0,176 \text{ Log } 10.RANKL$ . Persamaan ini dapat menjelaskan nilai BMD tulang belakang sebesar 52,5. Kata kunci: BMD, miR-21 serum, Osteoporosis, Pascamenopause </hr />

<b>ABSTRACT</b><br>

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 the study did not analyze other factors involved in postmenopausal osteoporosis. This study aimed to determine the role of serum miR-21 expression, concentration of RANKL, OPG, TGF- $\beta$  1, sclerostin and serum calcium, RANKL/OPG ratio, and physical activity on bone mineral density of spine in hypoestrogenic postmenopausal women with osteoporosis compared to no osteoporosis, with point of interest on the expression of serum miR-21. This study was conducted by comparative cross sectional design, conducted at Ulin General Hospital Banjarmasin, from August 2015 until July 2016. The subjects were divided into 2 groups of hypoestrogenic postmenopausal women with osteoporosis and without osteoporosis. Sampling was done by consecutive method. Examination of serum miR-21 expression using absolute quantification real-time PCR method. Statistical analysis using Spearman correlation test, Mann-Whitney U test and multiple linear regression. The subjects were divided into 2 groups of hypoestrogenic postmenopausal women with osteoporosis PMOP and without osteoporosis PMNOP each as many as 60 people. Median of serum miR-21 expression at 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 PMOP group. Moderate physical activity was significantly negative correlated with serum miR-21 expression. Multiple linear regression multivariate analysis using backward stepwise method obtained linear regression equation  $BMD = 1,373 - 0,085 \text{ Ln.miR-21} - 0,176 \text{ Log}_{10}.\text{RANKL}$   $R^2 = 52,5$ . Conclusion. Serum miR-21 expression in hypoestrogenic postmenopausal women with osteoporosis has been shown to be higher compared with no osteoporosis. Serum miR-21 expression proved to have a negative effect on spinal BMD values in hypoestrogenic postmenopausal women with osteoporosis of 8.5, with linear regression equation  $BMD = 1.373 - 0.085 \text{ Ln.miR-21} - 0.176 \text{ Log}_{10}.\text{RANKL}$ . This equation can explain the value of spinal BMD by 52.5. Keywords: BMD, Osteoporosis, postmenopausal, serum miR-21