

Efek Paparan Static Magnetic Field Terhadap Kadar Kalsium, Ekspresi SREBP-2 dan LDLR pada Mencit Strain C57BL/6J yang Obesitas = The Effect of Static Magnetic Field Toward Calcium Level, SREBP-2 and LDLR Expression in Obese Mice Strain C57BL/6J

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Abstrak

Dislipidemia menyebabkan abnormalitas pada lemak darah seperti peningkatan Low-Density Lipoprotein Cholesterol (LDL-c). Paparan SMF berpengaruh pada membran untuk memodulasi jumlah Ca^{2+} intraseluler melalui jalur calmodulin sehingga mempengaruhi ekspresi gen yang memodulasi degradasi LDL-c. Protein Sterol-regulatory element-binding protein-2 (SREBP-2) merupakan protein yang berperan dalam regulasi kolesterol dan sebagai faktor transkripsi dari gen Low Density Lipoprotein Receptor (LDLR) untuk berikatan dengan LDL-c yang ada di plasma darah, sehingga berkaitan dengan kadar LDL-c. Tujuan penelitian ini melihat efek paparan SMF dengan $B_{max}=2mT$ selama 1 jam/hari dalam mempengaruhi efek biologis sel sehingga mempengaruhi kadar kalsium, Ekspresi SREBP-2 dan LDLR. Mencit C57BL/6J jantan dibagi menjadi kelompok pakan normal dan High Fat Diet (HFD). Kelompok HFD dibagi menjadi kelompok Obes (0,2,7,14,dan21) berdasarkan hari paparan. Kemudian diambil plasma untuk melihat Kolesterol dan LDL-c dan organ hati untuk analisis kalsium dan ekspresi SREBP-2 dan LDLR. Terdapat perubahan kadar kolesterol dan LDL-c pada plasma darah secara signifikan $P<0.05$ dan cenderung mengalami peningkatan kadar kalsium, ekspresi LDLR, dan SREBP-2, pada kelompok pajan dibandingkan dengan kontrol $P>0.05$. Oleh karena itu, paparan SMF berpengaruh terhadap kadar total kolesterol dan LDL-c pada sirkulasi darah serta mempengaruhi kadar kalsium, ekspresi protein SREBP-2, dan ekspresi gen LDLR. Efek paparan SMF terhadap total kolesterol, LDL-c, kadar kalsium, ekspresi SREBP-2 dan LDLR. Bergantung pada lama paparan, dimana pada penelitian ini lama paparan optimal adalah 7 har

.....Dyslipidemia causes abnormalities in blood lipids, such as an increase in Low-Density Lipoprotein Cholesterol (LDL-c). SMF exposure affects the membrane to modulate the amount of intracellular Ca^{2+} through the calmodulin pathway, thereby affecting the expression of genes that modulate LDL-c degradation. Protein Sterol-regulatory element-binding protein-2 (SREBP-2) is a protein that plays a role in cholesterol regulation. As a transcription factor of the Low-Density Lipoprotein Receptor (LDLR) gene binds to LDL-c in blood plasma, it is related to LDL-c levels. This study aimed to look at the effect of exposure to SMF with $B_{max}=2mT$ for 1 hour/day in influencing the biological effects of cells, thereby affecting calcium levels, SREBP-2, and LDLR expression. Male C57BL/6J mice were divided into standard and high-fat diet (HFD) groups. The HFD group was divided into obese groups (0,2,7,14, and 21) based on the day of exposure. Then plasma was taken to see Cholesterol and LDL-c and liver for calcium analysis and SREBP-2 and LDLR expression. There were significant changes in blood plasma cholesterol and LDL-c levels $P<0.05$ and tended to have increased calcium levels, LDLR expression, and SREBP-2 in the exposure group compared to controls $P>0.05$. Therefore, SMF exposure affects total cholesterol and LDL-c levels in the blood circulation and affects calcium levels, SREBP-2 protein expression, and LDLR gene expression. Effect of SMF exposure on total cholesterol, LDL-c, calcium levels, SREBP-2, and LDLR expression. Depending on the length of exposure, in this study, the optimal exposure time was 7 days.