

## Pengaruh latihan fisik aerobik terhadap perubahan panjang telomer relatif sel darah putih tikus jantan dengan diet tinggi lemak kaya minyak kedelai = The effects of aerobic exercise on relative telomere length in leukocytes of male rats with high-fat diet rich in soybean oil

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### Abstrak

Latar belakang: Banyak studi menunjukkan latihan fisik memberikan efek positif pada metabolisme tubuh dan panjang telomer. Selain itu, diet juga memengaruhi dinamika panjang telomer sel darah putih. Tujuan penelitian ini adalah meneliti efek latihan fisik aerobik terhadap panjang telomer, kadar glukosa, trigliserida dan malondialdehida MDA pada subjek dengan diet tinggi lemak. Metode: Studi eksperimental menggunakan 12 tikus jantan 12 bulan yang dibagi dalam kelompok: 1 kontrol diet tinggi lemak 2 perlakuan diet tinggi lemak kaya minyak kedelai dan latihan aerobik. Latihan aerobik menggunakan treadmill 20 m/menit, 20 menit 5x/minggu. Pada minggu 0, 4 dan 8 dilakukan pengukuran ekspresi panjang telomer relatif sel darah putih dengan qRT-PCR, dan glukosa, trigliserida, dan MDA plasma dengan spektrofotometer. Hasil: Tidak ada perbedaan bermakna antara kadar glukosa, trigliserida dan MDA pada kedua kelompok. Terjadi penurunan kadar MDA pada kedua kelompok di minggu 8. Terdapat pemanjangan telomer relatif pada minggu 4 dan 8 di kedua kelompok jika dibandingkan dengan kelompok kontrol minggu 0, dengan laju pemanjangan yang tinggi pada kelompok kontrol di minggu 8. Kesimpulan: Delapan minggu latihan aerobik tidak mengubah glukosa dan trigliserida pada kondisi diet tinggi lemak kaya minyak kedelai. Diet tinggi lemak kedelai diduga menurunkan MDA pada kedua kelompok. Latihan aerobik selama 8 minggu menekan laju peningkatan panjang telomer relatif sel darah putih pada kondisi diet tinggi lemak kaya minyak kedelai.

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Background Many study results show that physical activity and exercise has a positive effect to glucose, triglyseride, stress oxidative status, and telomere length. Several studies have also shown that leucocyte telomere length dynamics were influenced by various environmental factors such as lifestyle and diet. The aim of this study is to investigate the effect of aerobic exercise on telomere length in high fat diet rich in soybean oil condition. Methods This was an in vivo experimental study, using twelve 12 male rats 12 months old. They were divided into two groups n 6 1 control group high fat rich in soybean oil diet 2 treatment group high fat rich in soybean oil and aerobic exercise. The aerobic exercise was conducted using rat treadmill, 5x week, 20 m min for 20 minutes. After 4 and 8 weeks we compared the relative telomere length between control group and treatment group using qRT PCR and also measured glucose, triglyseride, and malondialdehyde MDA level with spectrophotometer. Results There was no significant difference between glucose, triglyceride and MDA levels in both groups. There was a significant decrease in MDA levels between weeks 0 and week 8 in both groups. There was a telomere lengthening in both groups at week 4 and even more significant telomere lengthening at week 8 in control group. Conclusions Aerobic exercise for 8 weeks does not change plasma glucose levels and triglycerides in high fat rich in soybean oil diet conditions. A decrease MDA in both groups probably caused by high fat diet rich in soybean oil. Aerobic exercise for 8 weeks can suppress the lengthening of telomere in high fat rich in soybean oil diet

conditions.