Pengaruh latihan aerobik terhadap kadar nitric oxide, malondialdehid dan aktivitas spesifik enzim superoxide dismutase aorta abdominal tikus juvenil dan dewasa muda = Effect of aerobic exercise training on level of nitric oxide malondialdehide and superoxide dismutase specific activity in abdominal aorta of juvenile and young adult rat

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Abstrak

[ABSTRAK
Latar belakang: Hipertensi dan aterosklerosis berkaitan dengan disfungsi endotel yang ditandai oleh pengurangan produksi nitric oxide (NO) dan penurunan NO bioavailability. Disfungsi endotel dapat terjadi sejak usia anak-anak dan inaktivitas fisik menjadi faktor risiko penyakit kardiovaskular. Namun belum banyak penelitian mengenai perbedaan pengaruh latihan fisik aerobik pada juvenil dibandingkan dengan dewasa terhadap fungsi vaskular. Penelitian ini bertujuan untuk mengetahui pengaruh usia latihan fisik terhadap kadar NO, MDA dan aktivitas spesifik enzim SOD pada aorta abdominal dengan lama latihan yang sama.
Metode: Subjek penelitian adalah tikus usia juvenil dan dewasa muda yang dibagi dalam kelompok latihan dan kontrol. Latihan aerobik selama 8 minggu menggunakan treadmill dengan kecepatan disesuaikan dengan usia tikus selama 20 menit intermitten, 5x seminggu. Analisis kadar NO, MDA dan aktivitas SOD aorta abdominal menggunakan uji t-test independen (data berdistribusi normal dan homogen) atau uji U-Mann Whitney (data tidak normal).
Hasil: Kadar NO dan aktivitas spesisfik SOD lebih tinggi pada kelompok latihan dibandingkan kontrol, baik pada kelompok juvenil maupun dewasa muda. Namun hanya pada kelompok dewasa muda yang perbedaannya bermakna. Tidak terdapat perbedaan bermakna kadar MDA antara kelompok latihan dan kontrol pada kedua usia. Kadar MDA pada kelompok juvenil meningkat dan menurun pada kelompok dewasa muda akibat latihan aerobik selama 8 minggu.
Kesimpulan: Latihan aerobik dapat meningkatkan produksi NO dan NO bioavailability pada kelompok juvenil maupun dewasa muda. Peningkatan NO bioavailability terjadi melalui aktivitas spesifik enzim SOD. Diduga tingginya kadar MDA pada kelompok latihan dan kontrol juvenil terkait dengan usia dan stres fisik. Belum diketahui apakah peningkatan kadar MDA pada kelompok juvenil masih dalam kisaran normal atau tidak. Oleh karena itu, masih terdapat beberapa pertanyaan terkait manfaat latihan pada juvenil.
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ABSTRACT
Background: Hypertension and atherosclerosis are related to endothelial dysfunction, that characterized with decrease of NO production and bioavailability. Physical inactivity has contribute to endothelial dysfunction that can occur since childhood. However, until now, there were only few studies about the difference effect of aerobic training to vascular function in juvenile and young-adult rats. Therefore, this study aimed to know the effect of age related- exercise training to level of NO, MDA and specific SOD activity in abdominal aorta.
Methode: Subjects were juvenile and young adult male wistar rats divided into 2 group: control and aerobic

training. Aerobic training performed in 8 weeks with animal treadmill with age-dependent speed for 20 minutes intermittent exercise, 5x per week. Analysis of NO, MDA level, and SOD activity of abdominal aorta used t-test independent (normal distribution and homogen) or U-Mann Whitney (not normal distribution)
Results: NO level and SOD specific activity in training group were higher than control group, in both juvenile and young adult group. But, only in young adult group that had significant result. There was no significant different of MDA level in training group compared to control group in both juvenile and young-adult group, but MDA level increased in juvenile group and decreased in young-adult group because of aerobic training for 8 weeks.
Conclussion: Aerobic training can increase NO production and bioavaibility both in juvenile and young adult group. Increase of NO bioavailability was considered to the increase of SOD specific activity. We considered that the increase of MDA level in training and control juvenile group were related to age and physical stress. We didn?t know yet the increased level of MDA in juvenile group was still in normal range level or not. Therefore is still any question if training in juvenile rat was benefit or not.;Background: Hypertension and atherosclerosis are related to endothelial dysfunction, that characterized with decrease of NO production and bioavailability. Physical inactivity has contribute to endothelial dysfunction that can occur since childhood. However, until now, there were only few studies about the difference effect of aerobic training to vascular function in juvenile and young-adult rats. Therefore, this study aimed to know the effect of age related- exercise training to level of NO, MDA and specific SOD activity in abdominal aorta.
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