

Pengaruh latihan fisik aerobik pada tikus juvenile dan dewasa muda terhadap morfometrik, histopatologi, deposisi matriks ekstraseluler, serta ekspresi connexin43 di jantung = Effects of aerobic exercise on morphometric histopathologic extracelullar matrix deposition and connexin43 expression in heart of juvenile and young adults rats / Rustiana Tasya Ariningpraja

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Abstrak

ABSTRAK

Latar belakang: latihan fisik aerobik teratur dapat menyebabkan perubahan morfometrik, peningkatan ukuran miosit dengan peningkatan ekspresi connexin43 (Cx43) tanpa lateralisasi, serta peningkatan deposisi matriks ekstraseluler. Latihan fisik sebaiknya dimulai sejak masa anak-anak, guna mencapai kesehatan kardiovaskular di masa dewasa.

Metode: Tikus usia juvenile dan dewasa muda dibagi secara acak dalam 7 kelompok, yaitu: kelompok latihan fisik onset juvenile durasi 4 minggu dan kontrol, kelompok latihan fisik onset juvenile durasi 8 minggu dan kontrol, kelompok latihan fisik onset juvenile durasi 12 minggu, kelompok latihan fisik onset usia dewasa muda durasi 8 minggu dan kontrol. Latihan fisik disesuaikan dengan usia tikus dan dipertahankan pada kecepatan 20 m/menit selama 20 menit intermitten, 5x seminggu. Analisis morfometrik jantung, peningkatan ukuran miosit, deposisi matriks ekstraseluler, serta ekspresi serta distribusi Cx43.

Hasil: Tikus terlatih (5, 8, dan 12 minggu) pada kedua kelompok usia menunjukkan nilai berat jantung, berat ventrikel kiri, diameter rongga ventrikel, ketebalan otot jantung yang lebih tinggi dibandingkan dengan kelompok kontrolnya. Peningkatan ukuran panjang miosit juga meningkat kelompok latihan dibanding kontrol. Deposisi matriks ekstraseluler meningkat pada kelompok latihan dibandingkan kontrol. Ekspresi Cx43 juga meningkat pada sisi lateral.

Kesimpulan: Latihan fisik aerobik dapat meningkatkan ukuran jantung dengan peningkatan ukuran sel, peningkatan deposisi matriks ekstraseluler, peningkatan Cx43 pada sisi lateral. Peningkatan matriks ekstraseluler dan peningkatan lateralisasi menunjukkan peningkatan risiko aritmia.

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Background: Regular aerobic exercise can improve morphometric changes, an increase in the size of myocytes with increased expression of connexin43 (Cx43) without lateralization, and increase extracellular matrix deposition. Exercise should be started since childhood, in order to achieve cardiovascular health in adulthood.

Methods: Juvenile and young adult Rats randomly divided into 7 groups: juvenile onset 4 weeks exercise duration and control group, juvenile onset 8 weeks exercise duration and control group, exercise juvenile onset 12 weeks exercise duration, young adult onset 8 weeks exercise duration and control group. Physical

exercise adapted to the age of rats and maintained at speed of 20 m/minute for 20 minutes intermittent, 5 times a week. Morphometric analysis of the heart, increase the size of myocytes, extracellular matrix deposition, expression and distribution of Cx43.

Results: Trained rats (5, 8, and 12 weeks) in both age groups showed values of heart weight, left ventricle weight, ventricular cavity diameter, heart muscle thickness is higher than control group. Increased length of myocytes also increased in exercise group compared to the control. Increased deposition of extracellular matrix in exercise group than control. Cx43 expression was also increased in the lateral side.

Conclusions: Aerobic exercise can increase the size of the heart with increased cell size, increased extracellular matrix, increased Cx43 lateralization. Increased extracellular matrix deposition and increased lateralization showed an increased risk of arrhythmia.