Pengaruh durasi latihan fisik aerobik akut intensitas sedang terhadap persentase sel CD31 di darah tepi = The effect of moderate intensity acute aerobic exercise duration on the percentage of circulating CD31 cells

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Abstrak

Latar Belakang: Meningkatnya jumlah sel progenitor endotel (CD31+) merupakan salah satu faktor penting dalam mempertahankan homeostasis vaskular. Latihan fisik secara efektif akan meningkatkan jumlah sel progenitor endotel (CD31+) di darah tepi, sehingga dapat mencegah penyakit jantung dan pembuluh darah. Penelitian ini bertujuan untuk mengetahui pengaruh durasi latihan fisik aerobik akut intensitas sedang terhadap persentase sel CD31+ di darah tepi subyek dewasa muda sehat tidak terlatih.
Metode: Penelitian ini merupakan penelitian eksperimental. Sukarelawan sehat tidak terlatih (n=20) melakukan uji sepeda statis intensitas sedang (64-74% DNM) dengan durasi 10 menit atau 30 menit. Pengambilan darah dilakukan sebelum dan 10 menit setelah melakukan uji sepeda statis. Identifikasi sel progenitor endotel dilakukan dengan menggunakan penanda CD31. Persentase sel CD31+ di darah tepi dianalisis menggunakan flow cytometry.
Hasil: Tidak terdapat perbedaan bermakna pada rerata persentase sel CD31+ sebelum dan setelah latihan pada kelompok durasi latihan 10 menit (66,89 ± 10,17 vs 65,67 ± 10,05 , uji t berpasangan p=0,094) dan 30 menit (59,81 ± 8,69 vs 60,88 ± 9,40, uji t berpasangan p=0,154). Terdapat pola perubahan pada persentase sel CD31+ di darah tepi setelah latihan durasi 10 menit dan 30 menit. Pada durasi latihan 10 menit, 50% subyek mengalami peningkatan dan 50 % subyek mengalami penurunan. Pada durasi latihan 30 menit, 80 % subyek mengalami peningkatan.
Kesimpulan: Latihan fisik aerobik akut intensitas sedang durasi 30 menit namun tidak untuk durasi 10 menit, memiliki kecenderungan untuk meningkatkan persentase sel CD31+ di darah tepi subyek dewasa muda sehat tidak terlatih. Hasil penelitian ini menunjukkan bahwa pada latihan fisik aerobik akut intensitas sedang durasi 10 menit, sel progenitor endotel (CD31+) justru terlibat dalam proses perbaikan endotelium vaskular, dimana akan terjadi inkorporasi sel CD31+ ke lapisan tunggal sel endotel yang mengalami kerusakan. Latihan fisik aerobik akut intensitas sedang durasi 30 menit tampaknya dapat mempertahankan homeostasis vaskular melalui peningkatan persentase sel progenitor endotel (CD31+) di darah tepi.
<hr><i>Background: The increasing number of circulating CD31+ endothelial progenitor cells is one of the important factors for maintaining vascular homeostasis. Exercise will effectively increase the number of circulating CD31+ endothelial progenitor cells, which can prevent cardiovascular disease. This study aims to determine the effect of moderate intensity acute aerobic exercise duration on the percentage of circulating CD31+ cells in untrained healthy young adult subjects.
Methods: This study was an experimental study. Untrained healthy volunteers (n=20) performed ergocycle at moderate intensity (64-74% maximal heart rate) for 10 minutes or 30 minutes. Immediately before and 10 minutes after exercise, venous blood samples was drawn. CD31 marker is used to identify endothelial progenitor cells. The percentage of CD31+ cells in peripheral blood were analyzed using flow cytometry.
Results: There were no significant differences in the mean percentage of circulating CD31+ cells before and

after exercise for 10 minutes (66.89 ± 10.17 vs 65.67 ± 10.05, paired t-test p = 0.094) and 30 minutes (59.81 ± 8.69 vs. 60.88 ± 9.40, paired t-test p = 0.154). There is a change in the percentage of CD31+ cells in peripheral blood after exercise for 10 minutes and 30 minutes. 50% of subjects showed increase in percentage of CD31+ cells while 50% of subjects showed decrease in percentage of CD31+ cells after 10 minutes exercise. 80% of subjects showed increase in percentage of CD31+ cells after 30 minutes exercise. Discussion and conclusions: The results of this study indicate that moderate intensity aerobic exercise for 30 minutes, but not for 10 minutes, has a tendency to increase the percentage of circulating CD31+ cells in untrained healthy young adult. The results showed that in moderate intensity acute aerobic exercise for 10 minutes, CD31+ cells actually involved in the repair process, where there is incorporation of CD31+ cells into a single layer of endothelial cells that were damaged. It appears that moderate intensity acute aerobic exercise for 30 minutes can maintain vascular homeostasis through an increase in percentage of circulating CD31+ endothelial progenitor cells.</i>