

ABSTRAK

Latar Belakang: Latihan fisik kontinu intensitas sedang (LFKIS) terbukti memberikan efek menguntungkan pada pembelajaran dan memori spasial tikus pascaovariektomi. Akan tetapi latihan fisik kontinu dianggap kurang menyenangkan dan tidak hemat waktu sehingga menjadi kurang dipatuhi. Latihan fisik interval intensitas sedang (LFIIS) telah diusulkan sebagai rejimen latihan fisik yang efisien waktu dan menyenangkan. Akan tetapi belum ditemukan bukti bahwa LFIIS memberikan efek menguntungkan pada pembelajaran dan memori spasial tikus pascaovariektomi sebaik LFKIS.

Tujuan: Penelitian ini bertujuan untuk menguji efek LFIIS terhadap fungsi memori spasial dan kadar estradiol, kadar BDNF, kadar IGF-1, kadar sinapsin-1 dan kadar PSD-95 di hippocampus tikus pascaovariektomi, dan membandingkannya dengan LFKIS.

Metode: Sebanyak 28 tikus Sprague Dawley betina berusia 12 minggu secara acak dibagi menjadi 4 kelompok, yaitu operasi placebo (OP), ovariektomi tanpa latihan fisik (OTL), ovariektomi dengan LFIIS (OMI), dan kelompok ovariektomi dengan LFKIS (OMK). Tikus dari kelompok latihan fisik (kelompok OMI & OMK) melakukan 5 sesi latihan per minggu selama 8 minggu. Memori spasial tikus diukur menggunakan prosedur *Morris water maze*. Kadar estradiol, kadar BDNF, kadar IGF-1, kadar sinapsin-1 dan kadar PSD-95 di hippocampus diukur menggunakan ELISA

Hasil: Pembelajaran dan retensi memori spasial dari kelompok latihan fisik (OMI dan OMK) secara signifikan lebih baik daripada kelompok tanpa latihan fisik (OTL). Rerata kadar IGF-1 hippocampus tikus yang mendapatkan LFIIS maupun LFKIS lebih tinggi dibandingkan kelompok tanpa latihan fisik. Tidak ada perbedaan fungsi memori spasial, kadar estradiol, kadar BDNF, kadar IGF-1, kadar sinapsin-1 dan kadar PSD-95 di hippocampus antara kelompok tikus pascaovariektomi yang mendapat LFIIS dan LFKIS.

Simpulan: LFIIS dan LFKIS mengurangi penurunan fungsi memori spasial tikus pascaovariektomi, dan meningkatkan kadar IGF-1 di hippocampus.

Kata kunci: latihan fisik interval, ovariektomi, memori spasial, estradiol, BDNF, IGF-1, sinapsin-1, PSD-95

ABSTRACT

Background: Moderate intensity continuous exercise (MICE) has been revealed to have beneficial effects on learning and spatial memory of ovariectomized rats. However, continuous physical exercise is thought-out to be time-consuming and less enjoyable so it becomes less obeyed. Moderate intensity interval training (MIIE) has been proposed as a time-efficient and enjoyable physical exercise regimen. Yet, no evidence which confirmed that MIIE leads to an equal beneficial effect on the learning and spatial memory of ovariectomized rats as well as MICE.

Objective: This study aims to examine the effect of MIIE on the spatial memory and the levels of Estradiol, BDNF, IGF-1, Synapsin-1 and PSD-95 in the hippocampus of ovariectomized rats, and comparing with MICE.

Methods: Twenty-eight of 12-week-old female Sprague Dawley rats were randomly divided into 4 groups, i.e. sham-operated (SO), ovariectomized without physical exercise (OVx), ovariectomized with MIIE (OI), and ovariectomized with MICE (OC). The rats of the physical exercise groups (OI & OC) performed 5 training sessions per week for 8 weeks. The spatial memory of the rats was measured using the Morris water maze procedure. The concentration of Estradiol, BDNF, IGF-1, Synapsin-1 and PSD-95 in the hippocampus were measured using ELISA.

Results: The learning and spatial memory retention of the physical exercise groups (OI and OC) were significantly better than the ovariectomized without physical exercise group (OVx). The mean levels of IGF-1 in the hippocampus of the OI and OC groups were higher than the OvX group. There were no differences in the spatial memory, hippocampal estradiol levels, hippocampal BDNF levels, hippocampal IGF-1 levels, hippocampal synapsin-1 levels and hippocampal PSD-95 levels between the OI and the OC groups.

Conclusion: The 8 weeks duration of MIIE and MICE improves spatial memory of ovariectomized rats, and increase the IGF-1 levels in the hippocampus

Keywords: interval exercise, ovariectomy, spatial memory, estradiol, BDNF, IGF-1, synapsin-1, PSD-95