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Effects of exercise and/or sleep deprivation on anxiety – like behavior and body weight of female rats

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Background and Aim : Several studies investigated the effect of sleep deprivation and physical exercise on emotional behaviors in rodents; resulting findings however remain questionable. Additionally, sleep deprivation is indicated to cause oxidative impairment in the brain and is also shown to be anxiogenic. Previous study revealed that sleep deprivation (SD) increased oxidative stress in the brain of male rats while regular treadmill exercise averted this increase.

Methods : Intact and ovariectomized (OVX) female Wistar rats were used in the present study. The exercise protocol was four weeks treadmill running and the multiple platform method was applied to induce 72h sleep deprivation (SD). Anxiety-like behaviors were determined using open field test.

Results : The results showed that sleep deprivation increased anxiety-like behavior while prior treadmill exercise prevented this increase ($P<0.05$). As well as, exercised groups spent, more time in the center of open field compared to the other groups ($P<0.05$). In addition, SD had a reducing effect on the mean body weight of female rats ($P<0.05$).

Conclusion : Thus sleep deprivation increased anxiety-like behavior of rats. Moreover, treadmill exercise training reduced and prevented anxiety-like behavior of animals. On the other hand, exercising animals display anxiolytic effects. Sleep deprivation also had negative impacts on body weight.

Keywords : Sleep deprivation, Physical exercise, anxiety-like behavior, Female rat