Effect of Moderate-intensity Exercise on the Expression of Hypothalamic KiSS-1 and GPR54 mRNA in Diet Induced Obesity Rats

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Objective To observe the effect of high fat diet on the hypothalamic expression of KiSS-1 and the G-protein coupled receptor (GPR) 54 mRNA and explore the modulatory role of moderate-intensity exercise in the diet induced obesity male rats.

Methods After 8 weeks high fat feeding, 20 obesity 11-weeks SD rats were randomly assigned to high-fat diet sedentary (FS, n=8) and high-fat diet exercise (FE, n=8) groups, 20 normal diet 11-weeks SD rats also were randomly assigned to sedentary (SS, n=8) and exercise (SE, n=8) groups. During the following 8 weeks, obesity rats were continued expose to high-fat-diet. SE and FE groups did the 60%-70%V(O2)max treadmill training (5 days/week, 1 hour/day). The V(O2)max of exercise groups were remeasured every two weeks. The hypothalamic expression of KiSS-1 and GPR54 mRNA were tested in each group.

Results After the first 8-weeks high fat feeding, the obesity rats were heavier than normal diet group (491.74±26.19g vs. 410.05±45.77g, p<0.01). After 8-weeks training, the FE group was lighter than FS group (590.23±35.74g vs. 681±52.56, p<0.01). The FS group had higher hypothalamic expression of KiSS-1 mRNA (1.51±0.66 vs 0.75±0.27, p<0.05) and GPR54 mRNA (2.45±0.38 vs 0.61±0.15, p<0.01) than SS group. The FE group had lower hypothalamic expression of KiSS-1 mRNA (0.69±0.13, p>0.05) and GPR54 mRNA (0.58±0.10, p<0.01) than FS group.

Conclusions There is stimulating effect of high-fat diet induced obesity on hypothalamic expression of KiSS-1 and GPR54 mRNA. 8-weeks 60%-70%V(O2)max treadmill training could cure this effect.