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Endurance training enhances LXR expression in the liver of male Wistar rats

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Background and Aims: In the recent years liver x receptors (LXRs) have been characterized as key transcriptional regulators of lipid metabolism. LXRs were shown to function as sterol sensors protecting the cells from cholesterol overload by stimulating the reverse cholesterol transport and activating its conversion to bile acids in the liver. The purpose of this study was the analysis of LXR expression and plasma HDL-c level in response to treadmill–running training in rats.
Methods: Twelve male wistar rats (214±14g) were divided into groups: control (n=6) and trained (n=6) groups. Test group was trained at 28 m/min (0%grade) for 60 min/day, 5 days/week for 8 weeks. This condition corresponded to a moderate intensity of about of 65% of maximal oxygen consumption. Then rats were sacrified 24 h after the last session of exercise, then a portion of the liver was excised, immediately washed on ice, and freezed in liquid nitrogen for extraction of LXR mRNA. Plasma was collected for HDL-c measurments.
Results: Results were evident that LXR mRNA expression was significantly ($p < 0.05$) higher in trained rats compared to control rats. Furthermore, plasma HDL-c concentrations were significantly ($p < 0.05$) higher in trained rats the end of treadmill exercise.
Conclusions: In conclusion, a treadmill running, induced elevated HDL-c concentration which was accompanied with a higher LXR mRNA expression and the results of this study clearly showed that 8 weeks of endurance training with moderate intensity could improve the reverse cholesterol transport (RCT) process and has a positive effect in prevention of arteriosclerosis.

Keywords: Liver; LXR expression; Treadmill exercise; HDL-c; Reverse cholesterol transport; Male rats