

Blood volume is improved by forced mild physical training in the motor and hippocampal cortex of old mice

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The effect of mild forced physical training [1] (treadmill running 30 min a day, five days a week for 30 days at belt speed = 8 m/min, 0% incline) on the motor and hippocampal brain cortex was investigated in old (>24mo) mice by means of magnetic resonance imaging. The possible additive effect of physical training and testosterone [2] administration was also examined. Cortical thickness, quantitative transverse relaxation time (T2) maps, and regional cerebral blood volume (rCBV) were evaluated at baseline and after training. Results show that physical training alone induced significant increase of rCBV in both motor and hippocampal cortex. Cortex thickness and T2 maps were similar before and after training. Similar results were obtained in testosterone treated mice suggesting that testosterone does not add to physical training effect. This work provides first quantitative evidence that exercise initiated at old age is able to improve the hemodynamic status of the brain cortex in key regions for movement and cognition without inducing edema.

References

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- [2] Krause, D.N. et al. (2006) Influence of sex steroid hormones on cerebrovascular function. *J Appl Physiol* 101: 1252-1261.

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