



Amadou Wurry Jallow: Anti-Apoptotic And Pro-Survival Effect Of Exercise Training On Hypertensive Rat Cerebral Cortex

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Abstract: Hypertension is a critical vascular risk factor for end-stage brain damage. Neural apoptosis was found activated in cerebral cortices from hypertensive animals. The purpose of this study was to evaluate the anti-apoptotic and pro-survival effects of exercise training on hypertensive rat cerebral cortex. The excised brain tissues from ten sedentary male Wistar Kyoto normotensive rats (WKY group), ten sedentary spontaneously hypertensive rats (SHR group) and ten SHR rats undergoing treadmill exercise training 60 min/day, 5 days/week, for 12 weeks (SHR-EX group) were measured by TUNEL assay and Western Blotting. The SHR-EX groups showed lesser TUNEL-positive apoptotic cells compare to those in the SHR group. Protein levels of caspase- independent neural apoptotic pathway EndoG and AIF became decreased in SHR-EX groups compared with the SHR group. The expression levels of Fas ligand, Fas death receptor, Fas- associated death domain (FADD), activated caspase-8 and activated caspase-3 in Fas/FasL-mediated caspase-dependent apoptotic pathways and t-Bid, Bax, Bak, cytochrome c, activated caspase 9 and activated caspase-3 in mitochondria-mediated caspase-dependent apoptotic pathways were reduced in SHR-EX groups compared with the SHR group. Expression levels of Bcl2 family- related pro-survival pathways were significantly increased in SHR-EX groups compared to those in the SHR group. Exercise training appeared to decreased neural EndoG/AIF-related caspase- independent, Fas/FasL-mediated caspase-dependent, mitochondria-mediated caspase-dependent apoptotic pathways as well as enhanced Bcl2 family-related and IGF-1-related pro-survival pathways in the hypertensive cerebral cortex. These findings indicated a new therapeutic effect of exercise training in preventing hypertension-induced neural apoptosis in the cerebral cortex.

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Publications:

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[8th International Conference on Physiotherapy & Physical Rehabilitation, August 10-11, 2020](#)

Abstract Citation: [Amadou Wurry Jallow - Anti-Apoptotic And Pro-Survival Effect Of Exercise Training On Hypertensive Rat Cerebral Cortex](#)