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Neuroprotective potential of N-nitro-L-arginine-methylester in transient cerebral ischemia and reperfusion in rats

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Abstract

The role of nitric oxide (NO) inhibition in cerebral ischemia/reperfusion (I/R) remains controversial. Rho-kinases (ROCK) are serine–threonine kinases that play a vital role in cell survival, interaction between NO and ROCK isn't clear. Nuclear factor kappa B (NF-κβ) is a transcription factor that contributes to infarction in experimental stroke. This study investigated the potential neuroprotective effect of nonselective nitric oxide synthase inhibitor (L-NAME) in rat's transient cerebral I/R. 30 adult male Wistar rats (150-250g) were divided into three groups 10 rats in each: First group was sham-operated (control), I/R group of rats infused with 0.9% normal saline intraperitoneally prior to 30 minutes of left common carotid artery occlusion followed by 24-hour of reperfusion and test group infused with L-NAME (15 mg/kg per weight) intraperitoneally 15 minutes prior to the same I/R period. Neurobehavioral assessments were evaluated; NF-κβ via western blotting and ROCK using ELISA were estimated in the brain tissue. NO metabolites (nitrite and nitrate) were measured colorimetrically in serum and brain tissue. The L-NAME group showed a significant improvement in neurological deficit compared to both I/R and control groups (P <0.001). In I/R group NF-κβ, NO and ROCK were significantly increased compared to the control group and L-NAME pretreatment resulted in significant decrease of NF-κβ, NO and ROCK compared to I/R group (P <0.001). Thus, L-NAME significantly improved neurological deficit and decrease NF-κβ, NO and ROCK in the affected cerebral hemisphere following cerebral ischemic injury.

Biography

Hiba A. Awooda Is an assistant professor at the department of physiology, Faculty of Medicine and health sciences, Al Neelain University since 2006. She successfully completed her MSs and PhD in Physiology from Alexandria University (2011) and Al Neelain University (2013) respectively. Dr. Hiba teaches physiology to undergraduate medical, dental, physiotherapy and nurse students, she also a researcher at Al Neelain research center and our interest is to develop biomarkers that participate in treatment of acute ischemic stroke.