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Potential neuroprotective effect of N-Nitro-L-Arginine-Methylester in cerebral injury induced by transient ischemia/reperfusion in rats

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Role of nitric oxide (NO) inhibition in cerebral ischemia/reperfusion (I/R) remains uncertain; this work aimed to explore the neuroprotective potential of N-Nitro-L-Arginine-Methylester (L-NAME) non-selective NO synthase (NOS) inhibitors. The study involved 30 adult male Wistar rats (150-250g), divided into three groups;10 rats in each: sham-operated group (control), I/R group: infused with 0.9% normal saline intraperitoneally prior to 30 minutes of left common carotid artery occlusion followed by 24-hours of reperfusion, third group (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 using six clinical tests. Proper anesthesia was induced. Western blotting was used to estimate Nuclear factor kappa B (NF-κB), Tumor necrosis factor-α (TNF-α) using ELISA and NO metabolites (nitrite and nitrate), were measured colorimetrically in both plasma and affected cerebral hemisphere. The result shows that L-NAME group demonstrates a significant improvement in neurological deficit ($P < 0.001$) compared to both I/R and control groups. In I/R rats NF-κB was significantly increased compared to the control group and L-NAME pretreatment resulted in a significant decrease in NF-κB ($P < 0.001$) compared to I/R group. Serum level of TNF-α and NO were significantly increased in I/R group compared to the control group ($P < 0.001$), while L-NAME administration resulted in a significant decrease in serum TNF-α and NO ($P < 0.001$) compared to the I/R group. In conclusions, L-NAME pretreatment for rats undergoing cerebral ischemia/reperfusion significantly improve neurological deficit through it is anti-inflammatory effect in a rat's model of transient focal cerebral ischemia-reperfusion.

Biography

Hiba A Awooda is an Assistant Professor at the Department of Physiology, faculty of medicine. She successfully completed her master and Ph.D in the feild of neuropphysiology from Alexandria University (2011) and Al Neelain University (2013) respectively. As well as master of medical education from University of Khartoum. She teaches physiology to undergraduate medical, dental, physiotherapy and nurse students. She is also a researcher with interest in developing biomarkers that are used in the treatment of acute ischemic stroke. She has published more than 20 papers in reputed journals.

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