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Nanowired antioxidant compound H-290/51 downregulates ubiquitin and heat shock proteins expressions and attenuates exacerbation of spinal cordpathology in diabetic rats following trauma

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Increased ubiquitin expression around injured axons or neurons in spinal cord injury (SCI) is associated with neuronal death whereas, accompanied increase in heat shock protein (HSP) 72 kD helps in cell survival. We examined ubiquitin and HSP immunoreactivity in SCI in healthy and in diabetic rats. A longitudinal incisionon the right dorsal horn of T10-11 segments (2 mm deep and 4 mm long) in the urethane-anesthetizedhealthy or diabetic rats (streptozotocine75 mg/kg. i.p. for 3 days) showed a marked increase in ubiquitin immunoreactivity in T9, T12 segments at 5h that extended further to T4 and L5 level after 8 h SCI. The magnitude and intensity of ubiquitin and HSP expression was exacerbated in diabetic rats after SCI. Post-treatment with a potent antioxidant compound H-290/51 (50 mg/kg, p.o 30 min after injury; Astra Zeneca, Mölndal, Sweden) markedly reduced the ubiquitin and HSP expression at 5 or 8 h after injury in healthy animals. However, diabetic group, TiO2 nanowired H-290/51 (50 mg/kg, p.o 30) is needed to reduce ubiquitin and HSP expressionsunder identical conditions. Taken together our observations are the first to demonstrate that (i) diabetic animals after injury results in overproduction of ubiquitin and HSP expression, (ii) this activation of ubiquitin and HSP is related to cord pathology, and (iii) nanowired H-290/51 is needed for neuroprotection in in diabetic animals after SCI.

Biography

Aruna Sharma MD in Indian Medicine from Banaras Hindu University, Varanasi, India 1976, she is Secretary for Research working in University Hospital in Anesthesiology & Intensive Care Medicine at the Uppsala University, Uppsala, Sweden. She has authored more than 150 research papers in reputed Neuroscience journals and her research interest includes CNS injury and repair under the influence of anesthetics, nanoparticles andco-morbidity factors e.g., diabetes or hypertension. She is associated with development of key Neuroscience journals and is acquisition Editor of American Journal of Neuroproetction and Neuroregenartion, and Journal of Nanoneuroscience, published from American Scientific Publishers, Los Angeles, CA, USA.

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