

October 22-23, 2018
Athens, GreeceJ Neurol Neurosci 2018, Volume: 9
DOI: 10.21767/2171-6625-C3-015

THE NEUROPROTECTIVE AND NEUROREGENERATIVE ACTIONS OF HYDROGEN SULPHIDE DONOR, INTRACEREBRAL MSCS, GINKO BILOBA AND KEFIR IN ATTENUATING NEUROPATHOLOGICAL HALLMARKS OF ALZHEIMER'S DISEASE INDUCED BY LIPOPOLYSACCHARIDE IN RATS

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Neurocognitive disorders have been characterized by being a devastating long term neurological disease with a huge social and economic impact. Alzheimer's disease (AD) is the most common type of dementia accompanied with decline in cognitive functions.

Objectives: The main aim of this study is to suggest therapeutic protocol having the potentials for restoring and modifying neuropathological deposited hallmarks including both positive and negative lesions such as amyloid plaques, tau protein and synaptic loss.

Materials & Methods: Rats were divided into nine groups: (G1) control; (G2) rats received lipopolysaccharide (LPS) as a method of inducing non-genetically manipulated neuroinflammatory AD type; (G3) AD rats received NaHS; (G4) AD rats received mesenchymal stem cells (MSCs) intracerebrally; (G5) AD rats received MSCs+NaHS; (G6) AD rats received kefir+Ginko Biloba (GB); (G7) AD rats received MSCs+ kefir+GB; (G8) AD rats received NaHS+ kefir+GB; (G9) AD rats received MSCs+NaHS+kefir+GB.

Results: The induction of AD resulted in downregulation of cystathionine β -synthase enzyme (CBS) relative gene expression and glutathione (GSH) brain tissue level accompanied with overexpression in amyloid- β protein, mitogen-activated protein kinases (MAPK), tau protein, ACAT (Acyl-CoA cholesterol acyl transferase) relative gene expression and malondialdehyde (MDA) brain tissue level in addition to elevated caspase-3 serum activity level.

Conclusion: The present study clearly proved the beneficial role of NaHS as exogenous H₂S donor in attenuating AD drawbacks mainly through CBS/H₂S overexpression, enhancing the degradation of A β deposited plaques in addition to the ability of MSCs administrated locally to develop into different types of neural cells to compensate damaged ones. The role of administering Kefir and GB in maintaining normal brain functions suggested being as a result of their synergistic antioxidant and antiapoptotic actions.

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