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Recuperation of chronic cerebral hypoperfusion induced behavioral, biochemical and structural impairments by cysteinyl leukotriene-1 receptors modulator, originally approved as an anti-asthmatic

Bhupesh Sharma and Prabhat Singh
Amity University, India

Objectives: Chronic cerebral hypoperfusion (CCH) is a general pathophysiological condition occurring in vascular dementia (VaD) associated with negative impact on cognitive functions. Cysteinyl leukotriene-1 receptors (CysLT₁R) are extensively present in the central nervous system, where they participate in regulation of cognition, motivation, inflammation and neurodegeneration. The purpose of this study is to examine the role of montelukast; a specific CysLT₁ antagonist in CCH induced VaD in mice.

Methods: Two vessel occlusion (2VO) or permanent ligation of bilateral common carotid arteries technique was used to induce CCH in mice. Animals were assessed for learning and memory (Morris water maze), cholinergic function (increased acetylcholinesterase activity), brain inflammation, brain oxidative stress (brain superoxide dismutase, glutathione, catalase and thiobarbituric acid reactive substance level) and brain damage (brain infarct size using 2, 3, 5-triphenylterazolium chloride staining).

Results: Animals with bilateral carotid arteries occlusion have revealed impaired learning and memory, cholinergic dysfunction (increased acetylcholinesterase activity), brain inflammation, brain oxidative stress (reduction in brain superoxide dismutase, glutathione and catalase with an increase in thiobarbituric acid reactive substance level), with increased brain infarct size (2,3,5-triphenylterazolium chloride staining). The administration of montelukast considerably attenuated CCH induced cognitive impairments, cholinergic dysfunction, brain inflammation, brain oxidative stress as well as brain damage.

Conclusions: The results of this study suggest that CCH has induced VaD in animals, which was attenuated by the treatment with montelukast, a specific modulator of CysLT₁ receptors. This is the first study which reports the utility of montelukast in experimental VaD. Future research should be targeted towards identification of various possible mechanisms of CysLT₁ receptor modulators in VaD and associated conditions.

drbhupeshresearch@gmail.com
bsharma5@amity.edu

The “Tickle Trunk” of dementia care

Craig Smith
Champlain Community Care Access Centre, Canada

The Tickle Trunk is the basis of a fun and interactive exploration into the joys and successes of truly person centered care. In this education session, I target all workers from the front-line to upper management to empower them to give the best care possible. I challenge management to set up the system for ultimate success, building policies, procedures and environments that engender a spirit of positive energy and collaborative team spirit that best meet the needs of their clients or residents. This session is built for long term care but has been adapted to meet the needs of community based agencies and organizations as well. The Tickle Trunk, which gets its name from my days as a child watching Mr. Dressup on TV, is more than a physical box of non pharmacological interventions for dementia care but is really a philosophy of care that puts the person with dementia at the centre of the circle of care.

alzheimered@gmail.com