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Attenuation of vascular dementia by sodium butyrate in streptozotocin diabetic rats.

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Abstract

RATIONALE: Vascular dementia is the second leading cause of dementia, which is strongly associated with diabetes. Diabetes and dementia have become a major public health concern worldwide. At this point of time, it is very important to find the possible pharmacological agents which may be useful in management and therapy of dementia including Alzheimer's disease, vascular dementia, etc.

OBJECTIVES: To investigate the effect of sodium butyrate on streptozotocin (STZ) diabetes induced vascular dementia in rats.

METHODS: Diabetes and subsequent endothelial dysfunction and dementia were induced in rats by administration of single dose of STZ. Drug treatment was started after 1 month of STZ administration and treatment was continued until the end of the study. Morris water maze (MWM) test was employed for testing learning and memory. Endothelial function was measured on isolated aortic rings using student physiograph. Serum glucose, body weight, serum nitrite/nitrate, aortic superoxide anion generation, brain thiobarbituric acid reactive species (TBARS), reduced glutathione (GSH) levels, and acetylcholinesterase activity were also tested.

RESULTS: STZ treatment produced endothelial dysfunction, impairment of learning and memory, reduction in body weight and serum nitrite/nitrate, and increase in serum glucose, aortic and brain oxidative stress (increased superoxide anion, TBARS, and decreased GSH levels), and brain acetylcholinesterase activity. Treatment of sodium butyrate attenuated diabetes induced impairment of learning, memory, endothelial function, and various biochemical parameters.

CONCLUSIONS: Sodium butyrate may be considered as potential pharmacological agent for the management of diabetes induced vascular dementia.

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