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Riluzole ameliorates learning and memory deficits in Ab25-35- induced rat model of Alzheimer's disease and is independent of cholinoceptor activation

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Alzheimer's disease (AD) is a major global public health concern and social care problem that is associated with learning, memory, and cognitive deficits. Riluzole is a glutamate modulator which has shown to improve memory performance in aged rats and may be of benefit in Alzheimer's disease. In the present study, its beneficial effect on attenuation of learning and memory deficits in Ab25-35-induced rat model of AD was assessed. Riluzole administration at a dose of 10 mg/kg/day

p.o. improved spatial memory in Morris water maze and retention and recall in passive avoidance task and its protective effect was not neutralized following intracerebroventricular microinjection of muscarinic or nicotinic receptor antagonists. Further biochemical analysis showed that riluzole pretreatment of intrahippocampal Abmicroinjected rats is able to attenuate hippocampal AChE activity and lower some oxidative stress markers, i.e. MDA and nitrite, with no significant change of the defensive enzyme catalase. Furthermore, riluzole prevented hippocampal CA1 neuronal loss and reduced 3-nitrotyrosine immunoreactivity. It is concluded that riluzole could exert a protective effect against memory decline induced by intrahippocampal Ab25-35 through anti-oxidative, anti-cholinesterase, and neuroprotective potential and its beneficial effect is possibly independent of cholinoceptor activation.

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