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Ameliorative effect of Modified Atkins Diet against aluminium chloride induced cognitive, behavioural and neurochemical impairments in rats

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Dietary and metabolic therapies are emerging Alzheimer's disease (AD) treatment contender due to paucity of effective therapeutic interventions. Modified Atkins Diet (MAD) is a less restrictive version of ketogenic diet and has higher compliance rate. Therefore, in the present study MAD treatment of different durations were investigated for their effect in Aluminium chloride induced AD in rats. Alzheimeric rats received MAD for a period of 4 weeks (treatment 1), 6 weeks (treatment 2) and 4 weeks of MAD + 2 weeks without any treatment (treatment 3). Treatment 2 showed significant decrease in escape latency in MWM while increase in working memory, discrimination ratio and locomotor activity in MWM, NORT and OFT respectively. All the treatments have a mild effect on body weight, body mass index and fasting blood sugar level. Treatment 2 significantly decreased total protein, calcium, lactate dehydrogenase and acetylcholinesterase level in alzheimeric rats. Treatment 2 also improved lipid profile and oxidative stress parameters when compared with toxicant control rats. Treatment 2 also improved brain cell histology in AD rats. Treatment 1 and treatment 3 caused moderate to slight improvement in animal models and biochemical study parameters in alzheimeric rats. Results of the study conclude that MAD treatment for 6 weeks significantly restored cognition, behavioural and neurochemical abnormalities of AD.

Keywords: Alzheimer's disease, Ketogenic diet, Ketosis, Neurodegenerative, Oxidative stress