Potential Therapeutic Effect of Novel Multivitamins and Minerals Combination for Alzheimer's: In vitro and in vivo Studies

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The objective of this study was to control and normalize factors linked to death of brain neurons during Alzheimer’s disease (AD) using maximum safe dosages of multi-vitamins and minerals (MVM) which are Ascorbic acid, dl-alpha tocopherol, Nicotinamide, Cholecalciferol, Magnesium chloride. To achieve this objective, firstly, the in vitro activity of MVM was estimated by measuring DPPH and NO scavenging assays and effect on acetylcholine esterase (AChE) activity. Secondly, the acute toxicity of MVM was determined in vivo. Finally, AD induction was carried out in both genders of rats by using Scopolamine in both prevention and treatment protocols. Our in vitro results showed that, MVM had antioxidants and anti-inflammatory activities and acted as potent inhibitor for AChE. In vivo results showed that scopolamine administration (2mg/kg,i.p.) for 14 days decreased the learning ability, increased TBARS, AChE, NO, β- amyloid and urea level combined with reduction of GSH, glucose and albumin level in the brain tissue of both genders. MVM administration as protector or curing agent ameliorating these scopolamine's adverse effects on brain tissue as it increased learning ability and antioxidants parameters and decreased inflammatory markers and plaques formation even better than the reference drug (Donepezil). Also, toxicity studies showed that the used doses of MVM had no toxicity as each of ALT, GOT, Albumin, Glucose, Urea, Creatinine levels in blood were normal compared to control. Altogether, MVM administration had no toxicity and also was effective as curing or preventor drug for AD because it has multi-therapeutic targets through neuron death and AD because it acts as anti-AChE, antioxidants, anti-inflammatory and prevent β-amyloid plaques formation.