Investigation of effect of nano-encapsulated Curcumin in decreasing the risk of Alzheimer's development in STZ induced diabetes animal model

Rabia Duran[1], Sumeyra Pancur[2], Merve Beker[3], Savas Ustunova[4], Birsen Elibol[5], Fatemeh Bahadori[6]*, Gulacti Topcu[6]

BezmialemVakif University, Istanbul, Turkey

Abstract:

Increased epidemiological studies have shown that type 2 diabetes is a risk factor for the development of Alzheimer's pathology. The most likely causes of Alzheimer's pathology are insulin resistance and impaired insulin signaling pathway in the brain.In the type 2 diabetic rat brain, there is an increase in the levels of phosphorylated-Tau and Aβ, which are the Alzheimer's markers, and in the brain the insulin signaling pathway components (insulin-like growth factor-1 (IGF-1), phospho-AKT (protein kinase B), phospho-glycogen synthase kinase-3β (GSK3β)) has been decreased.Because of the similarities in the molecular mechanisms underlying the degenerative developments in the two diseases, pharmacological agents with an indication for type 2 diabetes have been considered as candidate drugs in Alzheimer's treatment.Curcumin is known by its clinical activitiesincluding anti-Alzheimer's and anti-diabetic effects.The significant biological activities of curcumin is being hindered by its low bioavailability. In this study the curcumin formulation with enhanced bioavailability prepared using nano-montmorillonite (Curc-MMT) was orally administered (50 mg/ animal/day)to Sprague Dawley male rats, in three subgroups: Control, Streptozotocin induced diabetes (STZ) and STZ+Curc-MMT,for 6 weeks.The hippocampusof rats wereexamined by immune-histochemical staining for phospo-Akt, phosphorylated-Tau, Aβ, IGF-1R and phospo-GSK3β.In rats' serum, also, IGF-1 and GLP-1 levels were determined using ELISA kits. Our data has shown that bioavailability-enhanced curcumin formulation is able to reduce the occurrence of diabetes induced Alzheimer's like pathology and could be counted as apotential therapeutic agent for prevention of Alzheimer's-like pathologies.

Biography:

Rabia Duran is currently studying fifth year at the Faculty of Pharmacy at Bezmialem Vakif University. She worked as a science volunteer in various botanical gardens and phytotherapy research centers. She has completed her internships at different areas such as pharmacy, hospital and pharmaceutical consulting firms. Her presentation has been evaluated as best poster presentation in previous congress she has got numbers of academic achievement scholarships. Her research interest includes natural products and biotechnology.

Speaker Publications:

1. "Investigation of anticholinesterase activity of a series of Salvia extracts and the constituents of Salvia staminea"; The Natural Products Journal 3 (1), 3-9
2. Efficacy of Biodegradable Curcumin Nanoparticles in Delaying Cataract in Diabetic Rat Model, PLoS One. 2013; 8(10): e78217.

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