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Nanotechnological pursuits to ameliorate therapeutic outcomes in Alzheimer's disease

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Alzheimer's disease (AD) is a neurodegenerative disorder that has no curative therapy till now. It's known to affect not only the memory and cognitive functions but also the behavior of the patient. Back to nature is the trend of many pharmaceutical researches. Piperine is an alkaloid with memory enhancing properties. This drug suffers many problems when delivered orally; it's a hydrophobic drug that is subjected to first pass metabolism. Since oral delivery is the most suitable route for treatment of chronic diseases, Our research group elaborated versatile types of nanocarriers as a potential delivery system for piperine. The use of bioactive excipients as surfactants for stabilization of Microemulsion was suggested to enhance piperine delivery to the brain. The elaborated system contained Caproyl 90

as oil, Tween 80, Cremophor RH 40 as surfactants and Transcutol HP as a co-surfactant. The particle size of the prepared formulations was less than 150 nm with negative zeta potential. The in vivo results showed a superior effect over the free drug. This work is the first to discuss the potential toxicity of Microemulsion where the results of toxicological studies revealed a potential nephrotoxicity although the used doses were within the reported safety margins. Brain toxicity results on the other hand showed safety of nanocarriers on brain cells. The current article highlighted an imperative question mark on use of ME in chronic diseases. High surfactant content acts as a double weapon that not only increase bioavailability but nephrotoxicity as well.

Biography

Yosra Elnaggar is an accomplished professional in pharmaceuticals, associated with Alexandria University, Egypt. As Head of International Publication and Nanotechnology Center at Pharos University, she specializes in Controlled and Targeted Drug Delivery, Nanotechnology in Drug Delivery, and Drug Formulation Development. Her expertise extends to Nanoparticles Drug Delivery, emphasizing pharmaceutical formulations and bioavailability enhancement. Yosra's impactful contributions showcase her dedication to advancing drug delivery methods for improved therapeutic outcomes, shaping the future of pharmaceutical technology.

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