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Asenapine maleate loaded solid lipid nanoparticles for oral delivery

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Asenapine maleate (ASM) is a new second-generation antipsychotic approved in August 2009 by U.S FDA for the acute treatment of schizophrenia and manic or mixed episodes associated with bipolar disorder in adults. It shows poor oral bioavailability of <2% due to extensive first pass metabolism in liver. The present study was aimed at developing and characterizing solid lipid nanoparticles (SLNs) of ASM. SLNs were prepared by solvent injection method by employing compritol ATO 888 as the lipid matrix and poloxamer 188 as stabilizer. A 32 full factorial design was employed to study the influence of independent variables (amount of lipid and % surfactant) on dependent variables (particle size, and % entrapment efficiency). Optimized ASM-loaded SLNs were further studied for zeta potential, *in vitro* drug release and TEM. Nanoparticles were lyophilized to improve the physical stability and obtain free flowing powder. Mannitol was employed as a cryoprotectant. Lyophilized ASM-loaded SLNs were characterized using DSC and XRD. The optimized ASM-loaded SLNs exhibited mean particle size 318.5±3.2 nm; polydispersity index of 0.255; zeta potential -29.75±(-0.92) mV; entrapment efficiency 53.13±1.77%; drug release extended up to 36 hours. TEM image exhibited spherical smooth surfaced nanoparticles. Accelerated stability studies of optimized ASM-loaded SLNs and lyophilized ASM-loaded SLNs revealed its stability. The developed formulation holds promising future due to reduction in dose and dosing frequency and thus reduces dose related side effects and improved patient compliance.

Biography

Pranav Shah has completed his PhD from Maharaja Sayajirao University of Baroda, India. He is an Associate Professor at Maliba Pharmacy College, Gujarat, India. He has published 16 papers in reputed journals, two book chapters and one book. He has presented several papers in national and international conferences.

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