Brief Summary

Formulation and evaluation of solid self-nanoemulsifying drug delivery system loaded with curcumin and quercetin for the treatment of type 2 diabetes mellitus

Liquid self-nanoemulsifying drug delivery system (L-SNEDDS) of curcumin and quercetin were prepared by dissolving them in isotropic mixture of Labrafil M1944CS®, Capmul MCM®, Tween-80® and Transcutol P® and further solidifying using *Ganoderma lucidum* extract, probiotics and Aerosil-200® using spray drying and converting into pellets using extrusion-spheronization. The mean droplet size and zeta potential of L-SNEDDS were 63.46 ± 2.12 nm and - 14.8 ± 3.11 mV and solid SNEDDS pellets was 72.46 ± 2.16 nm and -38.7 ± 1.34 mV, respectively. The dissolution rate of curcumin and quercetin was enhanced by 4.5 folds and permeability by 5.28 folds (curcumin) and 3.35 folds (quercetin) when loaded into SNEDDS pellets. The Cmax for curcumin and quercetin containing SNEDDS pellets was found 532.34 ± 5.64 ng/mL and 4280 ± 65.67 ng/mL, respectively. This was 17.55- and 3.48 folds higher as compared to their naïve forms. About 50.23- and 5.57-folds increase in bioavailability was observed for curcumin and quercetin upon loading into SNEDDS. SNEDDS pellets were found stable at accelerated storage conditions. The developed formulation has successfully normalized the levels of blood glucose, lipids, antioxidant biomarkers and tissue architecture of pancreas and liver in streptozotocin induced diabetic rats as compared to their naïve forms.

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