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Carvedilol nano lipid carriers: Formulation development, characterization and *in-vivo* evaluation

The purpose of this study was to develop carvedilol nanostructured lipid carriers (CAR-NLCs) using stearic acid and oleic acid as lipid, and to estimate the potential as oral delivery system for poorly water soluble drug. The particle-size analysis revealed that all the developed formulations were within the nanometer range. The EE and loading were found to be between 69.45–88.56% and 9.58–12.56%, respectively. The CAR–NLCopt showed spherical morphology with smooth surface under transmission electron microscope (TEM). The crystallization of the drug in NLC was investigated by powder X-ray diffraction and differential scanning calorimetry (DSC) and revealed that the drug was in an amorphous state in the NLC matrix. The *ex vivo* gut permeation study showed many folds increment in the permeation of CAR-NLCs compared to carvedilol suspension (CAR-S). The oral bioavailability study of CAR was carried out using Wistar rats and relative bioavailability of CAR–NLCopt was found to be 3.95 fold increased in comparison with CAR-S. *In vivo* antihypertensive study in Wistar rats showed significant reduction in mean systolic BP by CAR-NLCopt vis-a`-vis CAR-S (p50.05) owing to the drug absorption through lymphatic pathways. In conclusion, the NLC formulation remarkably improved the oral bioavailability of CAR and demonstrated a promising perspective for oral delivery of poorly water-soluble drugs. The promising findings in this investigation suggest the practicability of these systems for the enhancement of bioavailability of CAR.

Biography

M Aqil has completed his PhD from Hamdard University and Post-doctoral studies from University of Queensland, Australia. He is working as Associate Professor at Hamdard University, New Delhi. He has published more than 175 papers in reputed journals and has been serving as an Editor of *Journal of Pharmacy and Bioallied Sciences* since its inception.

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