

Preface

Phosphoglycoprotein (P-gp) which is an ABC transporter has been identified as the one responsible for active efflux of drugs. Drugs which are P-gp substrate have the problem in its drug absorption due to P-gp efflux. Thus, inhibiting the function of P-gp at various over expression sites can help to increase bioavailability of drugs. Nanoparticulate drug delivery system has the unique characteristic of submicron sized drug encapsulated particles which can evade recognition by P-gp efflux effect. Berberine (BBR) is a plant alkaloid having multispectral medicinal properties but it has poor bioavailability (less than 5%) as its uptake is inhibited by P-gp efflux. In the present study, BBR loaded polymeric nanoparticles were developed and its pharmacokinetic studies revealed that BBR NP are capable to evade the P-gp recognition and enhanced its bioavailability efficiently compared to group treated with BBR and verapamil (P-gp inhibitor). Surface coating with vitamin E TPGS is helpful in maintenance of NP stability and longer retention in systemic conditions. In-vitro haemocompatibility studies and in-vivo toxicity studies demonstrated the safety of nanocarriers. Thus, vitamin E TPGS coated polymer based NP offer promising delivery system for enhancement in the bioavailability of P-gp substrate; Berberine chloride. Further, the developed Naplet smart technology is feasible approach for oral administration of nanoparticles without compromising the characteristics of nanoparticles and its stability in the GIT.
