ABSTRACT

High blood pressure (BP) is a major public health problem globally. The increase in blood pressure is considered to be a major risk factor in the development of cardiovascular diseases (CVD), a leading cause of death worldwide. For controlling the blood pressure and to minimize the risk of cardiovascular complications long term treatment is essential. Nebivolol, a classical beta blocker and felodipine, a calcium channel blocker, have been widely used for the treatment of high blood pressure. Both nebivolol and felodipine belong to BCS Class II drugs and have poor aqueous solubility and poor oral bioavailability. Poor and variable bioavailability along with low biological half life require frequent dosing which lead to more fluctuation of drug concentration in the blood. This frequent dosing leads to poor patient compliance and poor therapeutic outcome. In order to achieve better therapeutic outcome it is required to maintain the effective drug concentration in blood for longer period of time. In the present study an attempt was made to develop oral sustained release delivery system of nebivolol and felodipine exploring nanoparticulate technology using two polymers Eudragit® RS100 and poly (D, L-lactic-co-glycolic acid) or (PLGA). The result showed that the developed nanoparticulate systems of nebivolol and felodipine have improved in vitro (drug release, intestinal permeation and stability study) and in vivo (toxicity, bioavailability and antihypertensive) performance compared to pure drug. The stability studies show no remarkable difference in drug potency in various storage conditions confirming the stability of the nanoparticulate system. The developed nanoparticulate systems also have the greater potential for effective antihypertensive activity after single use. The promising nanoparticulate systems of nebivolol and felodipine may be further explored to assess their suitability in human beings.