الملخص باللغة الانجليزية:

أ- Self-emulsifying drug delivery systems as a tool to improve solubility and bioavailability of resveratrol

Abstract:

Resveratrol is a nonflavonoidpolyphenolic compound which has a broad range of desirable biological actions which include antioxidant, anti-inflammatory, antidiabetic, cardioprotective, and antitumor activities. However, there is concern that the bioavailability of resveratrol may limit some of its clinical utility. So, the aim of this study was to enhance the dissolution rate and oral hypoglycemic and hypolipidemic effect of resveratrol. This was achieved using self-emulsifying drug delivery system. The solubility of resveratrol was determined in various oils, surfactants, and cosurfactants. Phase diagram was plotted to identify the efficient self-emulsification regions using olive oil, Tween 80, and propylene glycol. The prepared self-emulsifying drug delivery system formulations were tested for thermodynamic stability, emulsification efficiency, droplet size, zeta potential, and in vitro drug release. Self-emulsification time averaged 17–99 seconds without precipitation and the mean droplet sizes ranged from 285 to 823 nm with overall zeta potential of −2.24 to −15.4 mv. All formulations improved drug dissolution in relation to unprocessed drug with a trend of decreased dissolution parameters with increasing oil content. The optimized formula, F19, with dissolution efficiency of 94% compared to only 42% of pure drug was used to study the in vivo hypoglycemic and hypolipidemic effects of resveratrol in diabetic-induced albino rats and comparing these effects with that of pure resveratrol in different doses. Treatment with the optimized formula, F19, at 10 mg/kg had significant hypoglycemic and hypolipidemic effects in diabetic-induced albino rats which were nearly similar to the high dose (20 mg/kg) of unprocessed resveratrol. From the study, it was concluded that formulation F19 has good emulsification property with uniform globule size, satisfactory in vitro drug release profile, and significant in vivo hypoglycemic effects which identify future opportunities for resveratrol delivery.