OBJECTIVE

Out of all the diseases, diabetes is the leading cause for morbidity and mortality worldwide. The total global incidence of diabetes is rising from 171 million in 2000 to 366 million in 2030 as a result of various genetic levels, modern lifestyle factors like obesity, physical inactivity, aging, nutrition, and stress. The hyperglycemic condition of diabetic patients is untreatable but the blood glucose level can be controlled by daily dose of antidiabetic drugs. A plentiful of USFDA approved antidiabetic drugs are chemically synthesized as sulfonylureas, biguanides, thiazolidones, etc., and these drugs are used for the control of blood glucose level in diabetic patients.

Nonetheless, these drugs are quite seldom in compromising the complications associated with diabetes. Basically, the complications of diabetes are associated with the risk of oxidative stress induced within the physiological system could do some considerable damage to the cells and further complicates the disease. Conversely, making use of the isolates or bioconstituents of plants like flavonoids, glycosides and other numerous polyphenols in treating the chronic disease is a great challenge. Its use is limited because of its physicochemical property related to solubility, bioavailability, decreased intracellular uptake and degradation in various physiological environments. With variety of polymers available for the purpose of safeguarding and enhancing the bioconstituents to which it is used. The biodegradable polymeric system actually increases the solubility, bioavailability and protects the drug from gastrointestinal enzymes. Such benefiting method of polymeric system with nanoparticles has some remarkable advantage over the other contemporary methods.

There are several studies confirmed that the biomolecules of plant obtained have potent antidiabetic activity in various animal models. The potential constituents responsible for the related specific or pharmacological activity since long time have been studied as extracts of various solvents, which contain multiple components of plant isolates. Numerous scientific backup information are available to reinstate the potential activity of plant extracts and it is perplexed, of which constituent actually stands for a particular activity.
At this juncture the isolates of plant have been utilized, in the present study to exploit and confirm the potential antidiabetic and antioxidant activity using various in-vitro and invivo models. Different methods are adopted and optimized to utilize it for the preparation of nanoparticles. In this study an initiative has been taken to compare the activity of novelized preparation with that of the pure drug to establish the efficacy of the preparation. The conceptual dual isolate loading nanoparticles are greatly studied and compared with the pure isolate and single isolate loaded nanoparticles. A comparison and evaluation of antidiabetic and antioxidant activity of pure component, single loaded nanoparticles and dual loaded nanoparticles are included in the present study.

The current intention is to prepare the dual bioflavonoid isolate loaded nanoparticles by nanoprecipitation method with selected polymer, surfactant and solvent system. Further, characterization, evaluation including invitro and invivo antidiabetic as well as antioxidant activity is designed to confirm the specific activity of the nanoparticle preparation. Besides, toxicity studies and invitro cell line study is included in this research work. The work also designed to comprise a comparative representation of activity of pure bioflavonoid isolate, single loaded isolate nanoparticles and dual loaded nanoparticles.