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Formulation and development of multi-compartment dosage form of antihypertensive drugs

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In the present study, formulation of multi-compartment dosage form containing soft gelatin capsule of Nifedipine, granules of Losartan potassium and fast disintegrating tablet of Hydrochlorothiazide was designed to achieve immediate release of drug from the dosage form, to increase therapeutic efficacy and to improve patient compliance in case of hypertension. Triple combination of antihypertensive drugs induces superior reduction in blood pressure as compared to conventional dosage form. The basic aim of this work is to produce immediate release action of drug from the hard gelatin capsule containing soft gelatin capsule of Nifedipine, granules of Losartan potassium and fast disintegrating tablet of Hydrochlorothiazide. Soft gelatin capsule was prepared by encapsulation method using propylene glycol and PEG 400 as solubilizing agents. The granules were prepared by wet granulation method using PVP K30 as binder. The fast disintegrating tablets were prepared by direct compression method using croscarmellose sodium and crospovidone as super disintegrating agents. A 3² full factorial design was used to study the effect of croscarmellose sodium and crospovidone on disintegration time and % friability. The responses were analyzed using ANOVA and by the polynomial equation, it was found that the concentration of croscarmellose sodium and crospovidone significantly affects on disintegration time and % friability. The two check point formulations were prepared as suggested by the software. All the predicted values of responses were found to be close to the observed values. All these three formulations are then filled into empty hard gelatin capsules for the evaluation of disintegration time, weight variation, drug content and dissolution studies. Stability study shows that there was no significant change in disintegration time, drug content and *in vitro* drug release of the formulation. Multi-compartment dosage form was considered as optimized formulation for immediate release of Nifedipine, Losartan potassium and Hydrochlorothiazide. Thus, blood pressure control is achieved by formulating multi-compartment dosage form of fixed doses of three anti-hypertensive drugs.

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