ABSTRACT

Oral ingestion is traditionally preferred route of drug administration, providing a convenient method of effectively achieving both local and systemic effects. In conventional oral drug delivery systems, there is very little control over release of drug. The effective concentration at the target site can be achieved by intermittent administration of grossly excessive doses, which in most situations, often results in constantly changing, unpredictable and often sub or supra therapeutic plasma concentrations leaving the marked side effects.

In the present study we developed a controlled release formulation of various antihypertensive drugs to maintain constant therapeutic levels of the drug for over 12 hrs. Nimodipine, Azilsartan medoximil hydrochloride and Isradipine were selected as model drugs. Various formulations were developed with different polymers for each drug molecule for achieve pH-independent drug release of formulations; pH modifying agents via buffering agents were used. The precompression blend of all formulations was subjected to various flow property tests and all the formulations were passed the tests.

In Nimodipine various grades of HPMC were employed as polymers. Nimodipine dose was fixed as 40 mg and Total weight of the tablet was adjusted to 200 mg. Polymers in concentrations of 75 and 150mg concentration were employed. All the formulations were checked for standards and passed various physicochemical evaluation parameters within limits. The dissolution studies it was evident that the formulation (F2) showed better and desired drug release pattern i.e., 97.79 % in 12 hours. It followed zero order release kinetics mechanism. Invivo studies also carried out for this drug molecule.

In Azilsartan medoxomildose was fixed as 40 mg weight of the tablet was considered as 150 mg. Polymers used in the concentration of 60,120 and 180mg in formulation development. Formulations were passed various physicochemical evaluation parameters and they were found to be within limits. From the dissolution data it was evident that the formulations prepared with CMEC as polymer were unable to retard the drug release up to desired time period i.e., 12 hours. Whereas the formulations
prepared with ETHOCEL 7F P retarded the drug release in the concentration of 180 mg showed required release pattern i.e., retarded the drug release up to 12 hours and showed maximum of 96.10% in 12 hours with good retardation. The formulations prepared with METHOCEL K100LV showed more retardation even after 12 hours they were not shown total drug release. Hence they were not considered.

Next drugIsradipine dose was fixed as 80 mg and weight of the tablet was fixed to 100 mg and Polymers were used in the concentration of 40 and 80 mg concentration. All the formulations were passed various physicochemical evaluation parameters and they were found to be within limits. Where as from the dissolution studies it was evident that the formulation (F6) showed better and desired drug release pattern i.e., 96.47 % in 10 hours. It contains the natural polymer Isradipine as sustained release material. It followed zero order release kinetics mechanism. The best formulation was repeated again for reproducibility, and all the quality control tests were done for conformation. The results were found to be super imposable with each other. The optimised formula shall be utilized for the formulation development and other studies like bio-equivalence study, for successful launching of the product.