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Lepidium sativum based mucoadhesive microspheres of epalrestat; design, development and characterization

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Abstract

The purpose of the present investigation was to develop bioadhesive microsphere of model drug epalrestat having very short half-life and poor water solubility. Hence there is need to explore combined approach to overcome solubility issue and poor residence resulting from short half-life of drug by use of novel bioadhesive to impart controlled release with *Lepidium sativum* mucilage. Ternary complexation of epalrestat with β-cyclodextrin with addition of L-arginine by kneading method was used to obtain the solid systems like binary and ternary complex to overcome the solubility problem of epalrestat. The developed complexes were characterized by and evaluated for phase solubility, *in-vitro* dissolution. Dissolution rate of epalrestat and solubility were significantly improved by complexation with β-cyclodextrin as compared to epalrestat alone. Ternary complex incorporated with L-arginine proved better than binary complex. Hence, L-arginine could be exploited as a ternary component to improve the solubility of epalrestat via β-cyclodextrin complexation. *Lepidium sativum* mucilage, crees seed was extracted and used as a binder to develop bioadhesive microsphere because bioadhesive drug delivery is a blend of modern technique and newer dosage forms and overcomes the disadvantages concerned with conventional delivery. Bioadhesive microspheres of *Lepidium sativum* were prepared by solvent evaporation method based on 3^2 factorial design where the role of primary bioadhesive polymer was served by LSM (100, 150, 200mg) and poloxamer407(50, 100, 150mg)as secondary bioadhesive polymer which were considered as independent variables and bioadhesive strength, drug release at 12 hours and $T_{50\%}$as responses. Microspheres were evaluated for particle size, swelling, drug content, drug release ex-vivo bioadhesive strength and stability study. Developed microspheres were with adequate bioadhesive strength. Thus, the developed bioadhesive microsphere can be considered as a promising approach which improves adherence of drug to mucus membrane and results in prolonging the residence of drug with short half-life.

Biography:

Sneha Jagtap has completed M. Pharmacy from Department of Pharmaceutics, Bharati Vidyapeeth College of Pharmacy, Kolhapur Shivaji University and registered for Ph D at Shivaji University Kolhapur under faculty of Engineering and Technology (Pharmacy). She is working as an Assistant Professor at Annasaheb Dange college of Pharmacy Ashta & she is having 09 year teaching experience. She has published more than 12 papers in reputed national & international journals and also presented more than 05 papers in national & international conference.

Speaker Publications:

1. "Solubility enhancement technique: a review"; Journal of Pharmaceutical Sciences and Research 10 (9), 2205-2211
2. " Liquisolid compacts: a promising approach for solubility enhancement", Journal of Drug Delivery and Therapeutics 7 (4), 6-11
3. Enhanced dissolution and solubility of Epalrestat with β-Cyclodextrin ternary complex using Arginine"; Journal of Drug Delivery and Therapeutics 8 (6), 62-67
4. Sporopollenin: The Ground Discussion; Research Journal of Pharmacy and Technology 13 (3), 1555-1564
5. Formulation and Evaluation of Chitosan based Microparticulate Nasal Drug Delivery System of Rizatriptan benzoate; International Journal of PharmTech Research 2 (4), 2391-2402

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