OMICS Group Conferences
Accelerating Scientific Discovery

3rd World Congress on
Bioavailability & Bioequivalence

March 26-28, 2012 Marriott Hotel & Convention Centre, Hyderabad, India

Microwave Generated Bionanocomposites for Solubility And Dissolution Enhancement Of Poorly Water Soluble Drug Ibuprofen: In Vitro And In Vivo Evaluation

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In case of oral absorption of drug it dissolves first and then it gets absorbed by diffusion through gastrointestinal (GI) membranes. Basically GI environment is aqueous in nature and as well-known one third of drug population are water insoluble. Hence there is need for solubility and dissolution of such drugs. In present research work solubility and dissolution enhancement of practically insoluble drug Ibuprofen was done by formation of bionanocomposites (BNC's) using microwave induced diffusion (MIND), which ultimately leads to bioavailability enhancement. The BNC's were formed by using natural polymers such as gelatin, acacia, cassia and ghatti gum with the help of microwave. Selection of polymers was done on the basis of their surfactant and wetting property. Solubility studies were done in order to establish solubility enhancing property of this BNC's. To support solubility analysis results, dissolution studies i.e. powder dissolution and in vitro dissolution were done. It was found that as concentration of polymer in composite increases the solubility and dissolution enhances. The optimized ratio (drug: polymer) for all the composites was found to be 1:9. The BNC's were characterized by Fourier Transform Infra Red (FT-IR), differential scanning calorimetry (DSC), X-ray diffraction studies (XRD) and Scanning Electron Microscopy (SEM). The results of solubility and dissolution were confirmed by in vivo studies. In vivo performance of optimized formulation was accessed by rat paw edema using male albino Wister rats and demonstrated a significant reduction in inflammation when compared with marketed formulation BRUFEN. The novelty of present work is green and cost effective way of formation of drug nanocomposites with the help of microwave which can be scaled at industrial level. The method gives perfect way of solublization by generating drug dispersion at micro and nanoscale level in natural biodegradable stabilizing media. Hence the present study demonstrates the use of BNC's in solubility and dissolution enhancement.

Biography

[1]Mr. Sachin Shivaji Kushare has completed his M. Pharm. from North Maharashtra university Jalagaon. He is Assistant Professor in R. G. Sapkal College of Pharmacy, Anjaneri, Nashik, A distinguished institute in pharmaceutical education. He has two international publications with impact factor 2 in his credit. He has attended 3 international, 10 national conferences and 2 workshops.

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