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Solubility and dissolution rate enhancement of lornoxicam by formulating solid dispersions using spray drying technique

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The aim of the present study was to prepare and characterize solid dispersions of water insoluble non-steroidal anti-inflammatory drug, Lornoxicam (LOX), using different polymeric surfactants like Plasdone-S630, Lutrol-F68 and Soluplus for enhancing the solubility and dissolution of the drug. Solid dispersions were prepared by spray drying technique at 1:1, 1:2 and 1:3 drug to polymer ratios respectively. Furthermore, the solubility and the dissolution rate of drug in its different solid dispersion systems were explored and solid dispersion system which showed faster dissolution rate and maximum solubility, has selected for further characterizations. Techniques like, (DSC), (FTIR) and (SEM) were used to examine the physical state and chemical interactions between drug and polymer. Among all prepared Solid dispersion systems, the system which contain's 1:3 ratio of drug and Plasdone-S630, has shown seven fold increases in solubility than pure LOX and complete drug release within ten minutes.DSC thermograms showed significant broad and horizontal melting endotherm of the LOX when prepared as solid dispersion, instead of sharp melting endotherm at 230-232 □ C for pure crystalline drug. This indicates, there is change from crystalline to amorphous form for all ratios of LOX and Plasdone-S630. From FTIR depiction it has observed that there are chances of interactions between the N-H and carbonyl groups of LOX with the ester group of Plasdone-S630 because of shifting in the positions of respective spectra's. Finally, we concluded that dissolution rate and solubility of the LOX has increased significantly at ratio 1:3 for LOX and plasdone-S630.

Enhancement of solubility and dissolution of atorvastatin calcium by liquisolid technology

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Atorvastatin calcium is a BCS Class II drug having poor aqueous solubility and good permeability through the biological membranes. Absolute bioavailability of the drug is only 14-30% and the main reason attributed for such a low bioavailability is poor aqueous solubility of the drug. Various methods have been tried to enhance the solubility of the drug but most of them are not satisfactory due to either less enhancement of solubility or limited industrial application. Liquisolid technology is novel and one of the most promising techniques to enhance the solubility. In the present study the drug was screened with four non-volatile liquid vehicles namely PEG 400, PG, Polysorbate 80 and Cremophor®EL. The best result was obtained with PEG 400 because of the highest solubility of the drug in PEG 400 amongst all four of the non-volatile liquid vehicles. Hence optimization of the formula was done taking PEG 400 to achieve 100% drug release. Avicel PH 102, Cab-O-Sil®M-5 and sodium starch glycollate were used as carrier, coating material and superdisintegrant respectively. The In-vitro dissolution test was carried out with USP Type II (paddle) apparatus taking phosphate buffer (pH 6.8) as dissolution medium. The improved wetting property and increased surface area (molecular dispersion) are believed mechanisms for enhancement of the solubility of atorvastatin calcium. The method of production of liquisolid compact is very easy and there is no use of sophisticated equipment, which makes this technology industrially applicable.technology industrially applicable.