

Piroxicam liquisolid system: A method of dissolution rate enhancement

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Background and Aims: Piroxicam, a poorly soluble drug, is a non-steroidal anti-inflammatory compound with low dissolution rate which resulted in poor oral bioavailability. Liquisolid was considered as a technique for dissolution enhancement of poorly soluble materials. Therefore, the present study was an attempt to improve piroxicam dissolution rate using liquisolid technique.

Methods: Liquisolid formulations were prepared by mixing piroxicam with propylene glycol (as a non-volatile vehicle) and Avicel/Aerosil as carrier/coating materials (with the ratio of 5-20). Drug was also added to Avicel/Aerosil to prepare related physical mixtures. Optimum liquid load factor was calculated to obtain the optimum amounts of carrier and coating materials necessary to produce powders with acceptable flowing. After checking the flowability of liquisolids, they were subjected to in-vitro dissolution testing using USP dissolution apparatus I. Simulated gastric and intestinal fluids (pHs 1.2 and 7.2) were used as dissolution media. Difference factor (f1) was calculated to compare the dissolution data. Differential scanning calorimetry (DSC) was also performed to evaluate any interaction between the ingredients.

Results: According to the results, piroxicam liquisolids were prepared as free flowing powders with improved dissolution compared to intact drug. f1 values also confirmed significant difference between liquisolid and physical mixture formulations. Based on DSC thermograms, disappearance of drug melting endotherm in liquisolid sample could be attributed to the presence of amorphous drug or molecular dispersion of piroxicam in liquisolid.

Conclusions: Liquisolid technique could be considered as a useful method of piroxicam formulation due to the increased surface area and enhanced dissolution.

Keywords: Liquisolid; Piroxicam; Disolution enhancement