

Solubility enhancement of poorly aqueous soluble drug atorvastatin calcium using natural gums

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Atorvastatin, a practically water insoluble class-II drug as per BCS was physically mixed, co-grounded, kneaded with gum aghatti, gum acacia, gelatin, gum cassia respectively to improve the aqueous solubility as well as dissolution of drug, thus enhancing the systematic bioavailability of drug. The solubility and dissolution rate of atorvastatin (atR) increases at an optimum drug: gum ratio. Different ratios of drug and polymer were optimized for physical mixing, co-grinding, kneading reflects the significance particle size and solvent entrapment within the mixtures. Among the various methods co-grinding is proved to be the good one and co grounded mixtures were further proceeded for formulation development and *in vivo* evaluation. Co grounded solid mixtures were characterized by differential scanning calorimetry, X-ray diffraction studies, scanning electron microscopy and fourier-transform infrared spectroscopy. The immediate release tablets of co-grinded mixture of drug and gums were prepared and evaluated for pre and post compression parameters, interaction and compared with marketed tablet and proved to be superior in dissolution profiles. In vivo studies of prepared formulations had been performed on male albino wister rats using triton induced hypercholesterolaemic model and result showed significant lowering of cholesterol by prepared formulation when compared with that of plane drug. All the carriers used to enhance the bioavailability were of natural origin and methods are also very cheap and scalable at laboratory level which ultimately leads to the decrease in overall cost of the formulation. Thus present research fulfill two purpose one at a time that is it enhance the solubility of poorly soluble drug along with reduction in overall cost of the formulation. Both the issues are on top priority on many discoveries focused as well as generic based pharmaceutical companies.

Keywords: Atorvastatin, Gums, Physical mixing, Co-grinding, kneading, Solubility enhancement.

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