Liquisolid compact: Effect of Propylene glycol and Tween80 on atorvastatin release from tablet matrices containing Eudragit RSPO

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Abstract

Introduction:

Liquisolid system has been used to increase the dissolution rate of hydrophobic drugs. Since drug solubility play an important role in drug release profile, using appropriate solvent can lead the system to become sustain release. The aim of this study was to investigate the effect of different liquid vehicles and Eudragit RSPO on release characteristics of atorvastatin as a hydrophobic drug.

Methods and Results:

Several Liquisolid compacts with Propylene glycol and tween80 with different drug solvent ratio was prepared. The ratio of the carrier material (Eudragit RSPO: microcrystalline cellulose, (60:40)), for coating material (silica) was 2 in all formulations. To evaluate any interaction between atorvastatin and the other components, the differential scanning calorimeter (DSC) and Fourier transform infrared spectroscopy (FTIR) was used. Atorvastatin Liquisolid compacts containing Propylene glycol and tween80 as liquid vehicle increased dissolution rate of drug from 23.75±0.33 (in conventional matrix formulation) to 38.66±1.77 and 99.95±4.2 respectively, in first 480 minute. By increasing the ratio of tween80 to drug from 1:1 to 4:1 reduced drug retardation was seen, consequently the release percentage increased from 60.50±3.1 to 99.95±4.2. This was contrary to propylene glycol drug formulation. The resultant difference in effect of formulations was probably due to more solubility of atorvastatin in tween80 (26.77 g/100ml) in comparison to Propylene glycol (11.65 g/100ml). It was observed that a slight change on carrier (55.66 increased to 57.54%) and drug percentage (3.15% decreased to 2.59%) in formulation with Tween80:drug ratio (4:1), presented more retardation effect so that release percentage decreased from 99.95±4.2 to 75.92± 2.20. All formulations had hardness and friability between (35.6±0.57 - 43.4±1.14) N and (0.67% - 1.3%), respectively. The DSC, FTIR and X-ray evaluations revealed no interaction between drug and excipients.

Conclusions:

The liquisolid compacts with the suitable carrier can be promising technique to sustain release drugs, in addition, type of nonvolatile solvent has an important effect on liquisolid release profile.

Key words: Atorvastatin, Sustain release, Eudragit RSPO, Liquisolid system