J Bioequiv Availab, 4.3
doi: http://dx.doi.org/10.4172/0975-0851.S1.11

OMICS Group Conferences
Accelerating Scientific Discovery

3rd World Congress on
Bioavailability & Bioequivalence

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

Solubility enhancement of felodipine by solid dispersions with a novel polymeric solubilizer soluplus®

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Felodipine (FLD) is a calcium channel blocker, that selectively reduces smooth muscle contractile activity in resistant vessels and is widely used in the treatment of hypertension, heart failure and angina pectoris. Soluplus® (SOL) is a polyvinyl caprolactum- polyvinyl acetate- polyethylene glycol graft copolymer with an amphiphilic chemical structure.

The solid dispersions were prepared by solvent casting method. For this, FLD and SOL in ratios of 1:2, 1:4, 1:6 and 1:10 respectively were dissolved in minimum required volume of ethanol. The resultant solution was poured into Petri plates and kept in oven at 40 °C for drying. The dried mass was powdered in mortar, sieved using #60 mesh screen and stored at room temperature. The solid dispersions were characterized by differential scanning calorimetery (DSC), powder X-ray diffraction (XRD) & and fourier transform- infrared spectroscopy (FT-IR). Physical mixtures (PM) of the same ratios were also prepared. The solubility studies of PM and SD were conducted in phosphate buffer (pH 6.8). The samples were analyzed on UV-Visible spectrophotometer at 360 nm wavelength.

The solubility of pure felodipine in phosphate buffer pH 6.8 is 31.6 µg/ml. We observed increase in solubility of felodipine in both the PM and SD with the increase in the amount of soluplus®. The greatest increase (30 fold) was observed in the SD containing 1:10 of felodipine and soluplus®. Solid dispersions prepared using soluplus® could be a very useful option for Felodipine solubility enhancement could be used to prepare formulations with enhanced bioavailability.

Investigation of microemulsion system for ophthalmic drug delivery of ciprofloxacin

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Microemulsions have emerged as novel vehicles for drug delivery which allow sustained or controlled release for percutaneous, peroral, topical, transdermal, ocular and parenteral administration of medicaments. Microemulsions provided a promising alternative with improved drug solubility of water insoluble drug, ocular retention, increased corneal drug absorption and reduced systemic side effects whilst maintaining the simplicity and convenience of the dosage form as eye drops .The purpose of present study was to formulate microemulsion composed of oleic acid , Tween 80 ,ethanol and to investigate its potential as drug delivery. Pseudo-ternary phase diagrams were used to obtain the concentration ranges of oil, surfactant and co-surfactant . Five different formulations were formulated with various amount of the oil , water and mixture of surfactant and co-surfactant. In vitro permeability of ciprofloxacin from the microemulsions was evaluated using Keshary Chien diffusion. The droplet size and zeta potential of the microemulsions were determined using a Zetasizer Nano-ZS. Accelerated stability studies were performed for three months. Viscosity, Optical birefringence, PH and conductivity studies were also perfomed. The developed system showed an acceptable physicochemical behavior and presented good stability for three months. The ocular irritation test used suggested that the microemulsion did not provide significant alteration to eyelids, conjunctiva, cornea or iris. This formulation showed release of the drug for longer time as compared to conventional preparation that could allow for a decreased number of applications of eye drops per day. These results indicate that microemulsion system studied is a promising tool for ophthalmic delivery of ciprofloxacin.