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TITLE

ENHANCEMENT OF BIOAVAILABILITY OF ACECLOFENAC USING SOLID DISPERSION TECHNIQUE

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Aceclofenac is a poorly water-soluble, new generational non-steroidal anti-inflammatory drug. The aim of the present work was to investigate and compare the effect of PVP K-30 and PVP/VA 64 as carriers on *in vitro* dissolution characteristics of aceclofenac. Aceclofenac solid dispersions were prepared by fusion method.

All the prepared solid dispersions exhibited appropriate yield, average particle size, drug content, wetting time and moisture content. Scanning electron microscopy indicated the amorphous nature of the drug in the prepared formulation. The carriers did not show any incompatibility when tested using Fourier transform infrared spectroscopy and differential scanning calorimetry. A higher release in both, 0.1 N HCl, pH 1.2 and phosphate buffer, pH 7.4 was observed as compared to pure drug and their corresponding physical mixtures.

With perspective of the dissolution media, the phosphate buffer, pH 7.4 showed higher dissolution as compared to 0.1 N HCl, pH 1.2. The highest improvement in dissolution was found with PVP K-30 as carrier. The *in vitro* release from all the formulations was best described by first order kinetics (R^2= 0.9354 and 0.9268 in 0.1N HCl and phosphate buffer, respectively) followed by Higuchi release model (R^2 = 0.9029 and 0.9578 in 0.1N HCl and phosphate buffer, respectively) with better intestinal absorption, analgesic and anti-inflammatory activity ($p < 0.05$). The intestinal absorption followed the first order kinetics (Rv^2 = 0.9408). With enhanced solubility and dissolution, it is expected that aceclofenac in solid dispersions will demonstrate improved bioavailability.