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Development of nanoparticles loaded transdermal patches of tenoxicam

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Tenoxicam (TX) is NSAID indicated to treat rheumatoid arthritis but possess poor solubility, GI irritation and first pass effect. Hence in the present work it was initially made as nanoparticles to facilitate absorption and at later stage nanoparticles loaded transdermal patches were developed using promising nanoparticles of tenoxicam. Nanoparticles were prepared with chitosan by ionic-gelation technique Trail formulations such as F1 to F5 were prepared by using 0.25% w/v sodium TPP and different concentrations of chitosan (0.5%,1%, 1.5%,2% and 2.5%,w/v). These formulations were evaluated for percent drug content, and % drug release and mean particle size by zeta sizer. They were evaluated by percentage drug content, in-vitro release, particle size, zeta potential, DSC and FTIR analysis. Percentage drug content values were in acceptable range of 99.1 -99.8%. All formulations were produced in nanosizes and the sizes are 101.10nm, 108.7nm, 178.30nm, 314.3nm, and 923.2nm for F1, to F5 in sequence. DSC and FTIR analysis indicated there is no interaction between the drug and polymers. Among them F4 having mean particle size 178.30nm and zeta potencial of 35.5 mV45 was considered as pomising formulation. Transdermal patches of TX were prepared by solvent casting method using different ratios of polymers HPMC, E.C, and PVP. Chloroform: methanol (1:1) was used as solvent. Dibutyl phthalate and propylene glycol were added as plasticizer and permeation enhancer respectively. Three formulations were obtained with optimum properties in terms of percentage drug content (98.56%-99.88%), thickness (1.7mm±0.03 to 1.3mm±0.021 surface pH (6.5 to 6.9), folding endurance (191 to 200). Ex- vivo permeation studies of a patch (TT6) containing HPMC K400M 880 mg EC, 270 mg and PVP 260 mg exhibited optimum drug release of 99.51% in 60 min.

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