The Open Access Journal of Science and Technology

Abstract

Preparation and characterization of mefenamic acid loaded Polymeric nanoparticles by solvent evaporation and Ionotropic gelation techniques

~~Abbaraju krishna~~ sailaja

RBVRR Women's college of pharmacy,

Abstract:

Mefenamic acid is used for the treatment for rheumatoid arthritis, post-operative pain and dysmennoreha.It is chemically [2-[(2, 3-dimethylphenyl) amino] benzoic acid], an anthracitic acid derivative, which is a prostaglandin inhibitor. It is water insoluble, bitter drug with good oral bioavailability (but poor physico chemical parameters, aqueous solubility) are responsible for its decreased biological activity. It is available as tablets, capsules and suspensions. Nanoparticles have shown significant advancements in delivery of drugs and biomolecules. The primary objective of this investigation was to develop and characterize polymeric nanoparticles of Mefenamic acid. Mefenamic acid nanoparticles were prepared by solvent evaporation method and ionic gelation technique by changing the polymers and stabilizers.

In solvent evaporation method, Ethyl cellulose (EC) and Eudragit S-100(ED) were used as polymers and tween 80 as stabilizer. For each polymer, five formulations were prepared by varying the concentrations of polymer and drug. All the formulations were characterized for particle size, zeta potential, scanning electron microscopy and FTIR analysis. Among the five formulations of Ethyl cellulose and Eudragit S-100, F3 formulation of EC and ED showed promising results. On comparison, F3 of ED was found to be the best formulation with mean particle diameter of 103.6nm and zeta potential value of -59.5mV. The drug release was sustained till 12hrs following first order with Fickian diffusion.

For ionic gelation technique, Chitosan was used as polymer and Sodium tripolyphosphate as cross linking agent. Five formulations were prepared by varying the concentrations of polymer and drug. The mean particle diameter and zeta potential value of the best formulation (F2) was found to be 194.6nm and -35.3 mV respectively. FTIR studies showed the absence of chemical interaction between Mefenamic acid and polymer and the encapsulation of drug into the nanoparticles. The SEM results

indicated that Mefenamic acid nanoparticles were found to be spherical in shape. The Invitro drug release studies showed that the drug release followed Higuchi pattern with fickian diffusion. The drug release was sustained till 11hrs following first order rate constant for the best formulation.

Comparative study was performed between the best formulations of both the techniques. Solvent evaporation method was found to be the best technique for the formulation of Mefenamic acid nanoparticles because of the minimum mean particle diameter (103.6nm) and greater stability (59.5 mV).

Biography:

Working as Associate editor for Pharmaceutical Biotechnology published by Bio info publications working as Associate editor for Pharmaceutical Biotechnology published by Bio info publications.

Publication of speakers:

- A.Krishna Shailaja. A Comparative Study of Aspirin Loaded Bovine Serum Albumin Nanoparticles Prepared by Desolation Technique Using Various Desolvating Agents. Nano biomedicine and engineering
- A.Krishna sailaja. A Comparative study of Aspirin loaded Alginate nanoparticles prepared by desolvation technique using acetone and ethanol as desolvating agents. Nano science & Nanotechnology-Asia.2016.

Citation: Krishna Sailaja, Preparation and characterization of mef olymeric nanoparticles by solvent evap - oration and Ionotropic gelation techniques; Smart Materials 2020; November 17, 2020; Amsterdam, Netherlands