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Research Article

Formulation and evaluation of Acyclovir microparticles for Ocular Delivery

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ABSTRACT

The objective of the present work was to formulate and evaluate microparticles of Acyclovir and produced sustained drug delivery for ocular delivery. In this 9 batches(A_1-C_3) of acyclovir microparticle was prepared with ethyl cellulose, PVA and other ingredients by solvent evaporation technique. The prepared microparticles were evaluated for different parameters i.e % Drug yield, % Drug entrapment, Surface morphology, Zeta potential and in-vitro drug release for 24hrs in phosphate buffer 7.4 and simulated tear fluid. The best batch was performed stability studies for 6 months. The research concluded that Acyclovir microparticles could be a alternative for conventional dosage formand other phytochemical in herbs.

Introduction:

Microparticles are particles between 0.1 and 100 µm in size. Commercially available microparticles are available in a wide variety of materials, including ceramics, glass, polymers, and metals. Microparticles encountered in daily life include pollen, sand, dust, flour, and powdered sugar.

Microparticles have a much larger surface-to-volume ratio than at the macroscale, and thus their behavior can be quite different. For example, metal microparticles can be explosive in air. Microspheres are spherical microparticles, and are used where consistent and predictable particle surface area is important. Microparticulate drug delivery system is one of the processes to provide the sustained & controlled delivery of drug to long periods of time. They are small particles of solids or small droplets of liquids surrounded by walls of natural & synthetic polymer films of varying thickness & degree of permeability acting as a release rate controlling substance. Microparticles are small [0.2-5um], loded microspheres of natural or synthetic polymers. Microparticles were initially developed as carriers for vaccines and anticancer drug. [1]

Material and Method

Acyclovir was acquired as a gift sample from Archerchem, Mumbai, India. All other ingredients were of laboratory grades (Ethyl cellulose, PVA).

Compatibility Studies

The compatibility studies were carried out, by adopting IR spectroscopy with reference to the pure drug alone and its combination with chosen ingredients.

FTIR analysis

The drug-polymer compatibility was studied by FTIR (Shimadzu IR Affinity^{-1}) spectroscopy. The mixture of individual drug and potassium bromide was ground intoa finepowderusingmortarPestleandthencompressedintoaKBrdiscsinahydraulic press at a pressure of 75Kg/cm^2. Each KBr disc was scanned 45 times at a resolution of 2 cm^{-1}. The characteristic peaks were recorded in the case of each drug individually.

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