

## Preparation and characterization of acyclovir loaded nano-niosomes as a potential antiviral drug delivery system

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**Background and Aims:** Acyclovir (ACV) is the drug of choice against Herpes simplex virus Type 1 (HSV-1) infection. However, its limited solubility in water represents the main limitations of this drug. In addition, its plasma half life is 2.5 h, requiring repeated administration which may reduce the patient compliance. The aim of this research was to design a drug delivery system of acyclovir using nano-niosome to overcome the limitations of conventional therapies to extend drug release and improve antiviral activity of acyclovir.

**Methods:** The nonionic surfactant vesicles were prepared by thin film hydration method. The lipid mixture consisted of cholesterol and span 60, in various molar ratio and different lipid/drug ratio were dissolved in chloroform. The lipid film was hydrated with solution of acyclovir in phosphate buffer saline. Then prepared niosomal dispersion was sonicated and were extruded through polycarbonate filters (400, 200 and 100 nm). The prepared niosomes were characterized in terms of encapsulation efficiency (EE), particle size and invitro drug release rate.

**Results:** The average size of vesicles was around 100 nm. The EE was increased significantly with increasing the lipid/drug ratio. Most of the niosomes showed unilamellar spherical shape. The niosomal formulation exhibited significantly retarded release compared with the free drug.

**Conclusions:** The niosomal formulation could be a promising drug delivery system for acyclovir with prolonged drug release profiles.

**Keywords:** Acyclovir; Niosome, Sustained release; Drug delivery