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Editorial

Insights of Antivirals: A New Drug Delivery Systems

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SUMMARY

Viral infections are a major global health problem, representing a significant cause of mortality with an unfavorable continuously amplified socio-economic impact. The increased drug resistance and constant viral replication have been the trigger for important studies regarding the use of nanotechnology in antiviral therapies. Nanomaterials offer unique physico-chemical properties that have linked benefits for drug delivery as ideal tools for viral treatment [1]. Currently, different types of nanomaterials namely nanoparticles, liposomes, nanospheres, nanogels, nanosuspensions and nanoemulsions were studied either in vitro or in vivo for drug delivery of antiviral agents with prospects to be translated in clinical practice. This review highlights the drug delivery nanosystems incorporating the major antiviral classes and their transport across specific barriers at cellular and intracellular level. Important reflections on nanomedicines currently approved or undergoing investigations for the treatment of viral infections are also discussed. Finally, the authors present an overview on the requirements for the design of antiviral nanotherapeutics [2].

The guanine derivative antiviral drug Acyclovir (ACV) is one of the oldest molecules laying successful market until Date, being commercially available in various dosage forms for oral, topical and parenteral administrations. Clinical application of this drug is superior to new antiviral agents due to its potential values such as suppression of recurrence, safety profile, minimal drug interactions, and being inexpensive. ACV is slightly water-soluble, less permeable and poorly bioavailable, yet more potential antiviral molecule, the physicochemical modifications and novel dosage form approaches resulted with more than 100 research works within a decade. The survey of literature showed enormous reports on ACV formulation development, which includes modified tablets, particulate drug delivery, vesicular drug delivery, polymeric nanoparticles, bioadhesive systems, floating dosage forms, in situ gelling systems, transdermal delivery, implantable systems, emulsified dosage forms, polymeric films/patches, etc. As the drug could be administered via multiple routes for effective site targeted action at various doses, and attracted the attention of many researches, the review of the current approaches for the delivery of ACV could be more beneficial for the new scientists. This paper is a review of recent researches highlighting the development of newer techniques and novel dosage forms of ACV for better therapeutic efficacy, which were aimed at enhancing its solubility, permeability and bioavailability [3].

Novel drug delivery approaches on antiviral agents

Viruses have the property to replicate very fast in host cell. It can attack any part of host cell. Therefore, the clinical efficacy of antiviral drugs and its bioavailability is more important concern taken into account to treat viral infections [4]. The oral and parenteral routes of drug administration have several shortcomings, however, which could lead to the search for formulating better delivery systems. Now, day's Novel Drug Delivery Systems (NDDS) proved to be a better approach to enhance the effectiveness of the antivirals and improve the patient compliance and decrease the adverse effect [5].

CONCLUSION

The NDDS have reduced the dosing frequency and shorten the duration of treatment, thus, which could lead the treatment more cost-effective. The development of NDDS for antiviral and antiretroviral therapy aims to deliver the drug devoid of toxicity, with high compatibility and biodegradability, targeting the drug to specific sites for viral infection and in some instances it also avoid the first pass metabolism effect. This article aims to discuss the usefulness of novel delivery approaches of antiviral agents such as niosomes, microspheres, microemulsions, nanoparticles that are used in the treatment of various Herpes viruses and in Human Immunodeficiency Virus (HIV) infections.

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