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Commentary

Onsite Drug Action: The Targeted Drug Delivery Systems

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COMMENTARY

The targeted drug delivery systems are the type of drug delivery systems that target the drug directly to the selective site or to the targeted organ or the tissue. In these drug delivery systems, the drug may be delivered to the capillary bed of the active sites, to a specific site of a cell or intracellular region, to the specific organs, to the specific tissues etc. In general, the conventional drugs are of with many side effects and certain complications due to the improper distributions throughout the fluids of the body. For treatment or cure for preventing the disease or disorder, the other modes of drug delivery show non-specificity and non-selectivity. Therefore, the targeted drug delivery system may help in enhancing the drug reaching out to the specific organs, as the many drugs are failing to arrive towards the target site of the body. In order to attain a desired pharmacological response, at the selected site, without unwanted effects at other sites, thereby the drug can act with minimal side effects as well excellent therapeutic effects.

The targeted drug delivery systems have certain ideal characteristics such as; biochemically inert, non-immunogenic, both physically as well as chemically stable i.e., in-vivo and in-vitro, restriction towards the target sites, no drug action gets affected with the drug release, therapeutic amount of drug release, minimal drug leakage, carriers are used for targeted drug delivery to release at the site specific. These targeted drug delivery systems are having the many positive notes such as; reduced toxicity is seen with site specific drug delivery. The drug can be formulated with lesser dose to obtain desired effect. There is a chance to escape from the first pass metabolism. In comparison with the conventional dosage form, the dosing rate is less. Most importantly, there is no chance for the drug for showing toxic effects at the non-targeted sites. With the positive notes, there are few draw backs with these delivery systems, as they require highly sophisticated equipment for formulation. Also, requires the skilled personnel for manufacturing etc. Also, it is difficult to maintain and store the formulation as well as high of cost.

There are few approaches for a drug delivery system to attain the targeted drug delivery systems for the feasible drug delivery. The chemical modifications of the parent molecule to a derivative which must be activated at the targeted site. There must be use of the polymers for targeting such that to direct the drug to the site of action. There are various types of targets such as; cells, in-vitro genome grafting, manipulation of DNA, accessible anatomical compartment, cerebral ventricles, pleural cavity, lungs and lymphatic cells. Lymphocytes and antigen presenting cells. Macrophages and other phagocytic cells and kupffer cells, tissue macrophages cells and monocytes of MPS. The targeting can be through the pro-drug approach, chemical delivery. Also there can be active targeting, passive targeting, physical targeting and chemical targeting. In targeting, the bioavailability is dependent on the pharmacokinetic and pharmaco-dynamic issues in the drug and it plays the major role in the targeted drug deliver systems.

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CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

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