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Commentary

Significance of Pulsatile Drug for Cure of Diseases

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DESCRIPTION

Disease may modify the temporal (biological rhythm) structure of the human body, resulting in major changes in therapy response. Despite the fact that continuous release systems have been developed, the biological systems have become more evolved and they are less sensitive to those type of release system. In certain cases, such as the timed administration of hormones and certain medications, sustained and controlled release devices are ineffective. This requirement was met by the pulsatile drug delivery system. Pulsatile or chronomodulated drug release refers to a technique in which a drug is released abruptly after a predetermined lag period or a discrepancy based on disease states circadian rhythms (Many human body functions, including metabolism, behaviour, sleep patterns and hormone production, are governed by the circadian rhythm) during this time lag, no drug is released from the system and the product has a sigmoidal drug release profile, which includes a period of no release before a rapid and full drug release. This delivery system is more appropriate for the drug such as proteins and peptides which are highly metabolically degraded.

In the case of long-term care, drug resistance can develop along with the ADR but in case of chronomodulated drug delivery system the chances of the ADR, drug resistance is very less since here the desired concentration of the drug is released from the device and it provides the optimal drug concentration at a specific time point is available. This approach works well with drugs that have a lot of first-pass metabolism and those that are targeted to particular parts of the intestine. The plasma peak is obtained at an optimum moment, the amount of doses per day can be decreased, it is with saturable first pass metabolism and tolerance development can also be prevented by developing the pulsatile system for precise colonic delivery. Therapy with modified release dosage forms and zero order drug release results in regulated and steady drug levels in plasma throughout the day. Single unit systems and multiparticulate systems are the two types of pulsatile drug delivery systems. Because of benefits such as predictable gastric emptying, lower risk of dose dumping, versatility in release patterns and improved bioavailability, multiparticulate drug delivery systems are favoured over single unit dosage types. Minitabs are a multiparticulate device that is filled inside a capsule, demonstrating the advantages of tableting within a capsule. These minitabs can be programmed to deliver the medication at various points in the gastrointestinal tract. Minitabs come in a variety of sizes to address the issue of drug loading, with diameters ranging from 1.5 mm to 4 mm. On the minitabs, additional layering can be done to monitor the release at different rates.

CONCLUSION

For drug release, these systems depend on the coat disintegration. Effervescent excipients, swelling agents, or osmotic pressure are used to create the pressure needed for the coating to rupture. After water penetrated in the core, an effervescent mixture of citric acid and sodium bicarbonate embedded in a tablet core coated with ethyl cellulose generate carbon dioxide, resulting in pulsatile drug release after the coat ruptured. The osmotic and swelling effects are integrated in this method. Drug, a low bulk density solid and liquid lipid content (e.g. mineral oil) and a disintegrants make up the core. Finally, cellulose acetate is applied to the core. Water penetrates the core when immersed in an aqueous medium, displacing lipid content.

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