International Advance Journal of Engineering, Science and Management (IAJESM)
ISSN -2393-8048, January-June 2019, Submitted in April 2019, iajesm2014@gmail.com

TARGETED DRUG DELIVERY SYSTEM

Shashi Kiran Misra, University Institute of Pharmacy, CSJM University, Kanpur
Anupriya Kapoor, University Institute of Pharmacy, CSJM University, Kanpur, anupriya321@gmail.com

ABSTRACT

Targeted Drug Delivery system is often referred to as smart drug delivery. Targeted drug delivery is a technique for giving a patient medication in a way that elevates the concentration of the drug in specific areas of the body over others. By concentrating the medicine in the target tissues while lowering its relative concentration in the non-target tissues, targeted drug delivery aims to increase the concentration of the drug in the target tissues. The decrease in dosage and adverse effects of the medicine has been this technique's intrinsic benefit. Targeted drug delivery system is a self-contained, discrete dose form that is administered to the systemic circulation at a regulated pace through unbroken skin. To overcome the limitations of traditional medication administration, a system uses drug delivery using nanoparticles. Targeted medication delivery techniques include both active and passive targeting. Targeted drug administration provides certain additional benefits, including less adverse effects, avoiding hepatic first pass metabolism, improving drug absorption, using a lower dosage than with traditional drug delivery, and less variation in circulating drug levels.

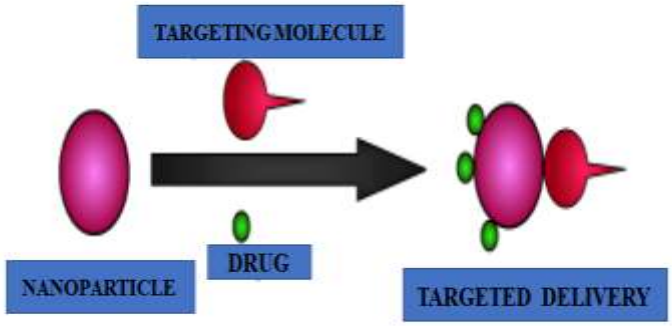
KEYWORDS- Nanoparticles, Medication, Brain targeting Drug delivery system

INTRODUCTION

In a targeted drug delivery system, the medication is released in a dosage form, as opposed to the typical drug delivery method, which requires drug absorption through a biological membrane So this type of drug delivery system known as targeted drug delivery system, the medication is solely given to the site of action and not to unintended organs, tissues, or cells. The system is based on a technique that increases the efficacy and minimises the adverse effects of a drug by delivering a specific quantity to a targeted sick location of the body over an extended period of time. This helps keep the body's essential plasma and tissue drug levels stable, preventing any harm to healthy tissue.The carriers that are utilised should be easily or quickly removed from the body. The targeted medication delivery system should be easy to prepare, reproducible, and affordable. In comparison to traditional drug delivery, targeted drug delivery has a higher solubility and greater drug stability. Compared to conventional drugs, which have poor absorption, a short half-life, and a high volume of distribution, tailored drug delivery has less of these drawbacks [1].

Targeted drug delivery system may be-

1. Brain targeting drug delivery system
2. Tumour targeting drug delivery system



IDEAL CHARACTERSTICS OF TARGETED DRUG DELIVERY SYSTEM

1. It should be non-toxic
2. It should be chemically and physically stable at all environment.
3. Drug action should be unaffected by drug release
4. Drug will distributed uniformly
5. The employed carriers must be biodegradable or easily removed from the body without any issues or modification of the sick condition [2,3].

ADVANTAGES OF TARGETED DRUG DELIVERY SYSTEM

1. Drug will release over an extended period.
2. Patient compliance should be good.
3. Low dose may be given proper action.
4. Self-administration is easy.
5. Absorption of drug is easy as compared to other delivery system [4].

DISADVANTAGES OF TARGETED DRUG DELIVERY SYSTEM

1. Rapid clearance of drug may be occurred.
2. Expensive.
3. Stability issue may be occurred.
4. Formulation is quite tough as compared to other.
5. Requires a skill during manufacturing and administration [5]

APPLICATIONS OF TARGETED DRUG DELIVERY SYSTEM

1. Many disorders, including cardiovascular diseases and diabetes, are treated using targeted medication delivery. To treat a variety of ailments, regenerative techniques are being explored. the creation of several regeneration methods for treating cardiac problems in recent years [6]
2. In stem cell treatment, targeted medication delivery is also employed. By establishing a microenvironment prior to myocardial infarction, this treatment aids in myocardium tissue regeneration and the restoration of heart contractile function [7].
3. Bio detection of pathogens.
4. Tissue engineering Helps in the critical issue of tissue and organ failure will only get worse as the population ages and expands. Transplantation, surgical repair, artificial prostheses, mechanical devices, and, in rare circumstances, pharmacological therapy are all alternatives for treatment. Therefore, tissue engineering helps to delivers a drug at a particular organ or tissue [8]
5. Liposomes can be used as drug delivery for the treatment of tuberculosis. The traditional treatment for TB is skin to chemotherapy which is not overly effective, which may be due to the failure of chemotherapy to make a high enough concentration at the infection site. The liposome delivery system allows for better microphage penetration and better builds a concentration at the infection site. The delivery of the drugs works intravenously and by inhalation. Oral intake is not advised because the liposomes break down in the Gastrointestinal System [9].
6. 3D printing is also used by doctors to investigate how to target cancerous tumors in a more efficient way. By printing a plastic 3D shape of the tumor and filling it with the drugs used in the treatment the flow of the liquid can be observed allowing the modification of the doses and targeting location of the drugs[10].
7. Detection of proteins.
8. For the treatment of TB, liposome is employed. Although used to treat TB, chemotherapy is ineffective. The targeted site's liposome concentration and microphage penetration are both improved.

CONCLUSION

The complicated cellular network of an organism makes it challenging for drug delivery molecules to reach their target sites. Last but not least, targeted medication delivery is emerging as one of the most cutting-edge methods in the medical sciences for the detection and treatment of a few fatal illnesses. The research and development in the clinical and pharmaceutical domains have passed the infant stage and is currently at its peak. Overall, it can be said that the science of site-specific or targeted drug administration has gotten more mature and smarter with time and the development of scientific technology thanks to the large database of many investigations. A new age of therapy and diagnostics is brought about by the clinical use of all these techniques and cutting-edge technology.The identification, analysis, and resolution of several issues that arose during the development of drug targeting techniques for clinical use in various treatments, particularly in the treatment of cancer, has

been done. A few of these preparations have now entered the clinical testing or trial phases and are available for purchase.

REFERENCES

1. Nagoba Shivappa N., Warkari Rajan D., Chandrawanshi Mayuri J., "A review on targeted drug delivery system", American Journal of PharmtechResearch,2018; 2-8, ISSN: 2249-3387
2. M. Gupta and V. Sharma, "Targeted drug delivery system: A review," Research Journal of Chemical Sciences, vol. 1,2011.
3. Hillery A.M., Lloyd A.H., Drug delivery and targeting, London, Taylor & Francis e-5. Library, 2005
4. Bae, Y.H., Park, K., "Targeted drug delivery to tumors: Myths, reality and possibility,"Journal of Controlled Release, vol. 153, 2011.
5. Damle Deepti R., Gawande Deepti R., "A review on brain specific drug delivery system", GSC biological and pharmaceutical sciences 2018, 13(02), 068-079
6. Tsuji A., Small molecular drug transfer across the blood–brain barrier via carrier-mediated transport systems. NeuroRx. 2005; 2:54–62.
7. Singh R., Lillard, JW., "Nanoparticle-based targeted drug delivery" Experimental and molecular pathology. 2009; 86: 215-223.
8. Rani, K.,Paliwal, S., "A review on targeted drug delivery: Its entire focus on advanced therapeutics and diagnostics," Scholars Journals of Applied Medical Sciences, 2014.
9. Parle Pallavi, Aggarwal Geeta and Kumar S. L. Hari Brain Targeted Drug Delivery System: A Review World Journal of Pharmacy and Pharmaceutical Sciences 2016.
10. J., Preethi,Swaroop, Hemanth, "A Review on Nanoparticles in targeted drug delivery system" Research and Review: Journal of Material Science 2014.