INTRODUCTION

In recent years, considerable attention has been focused on the development of new drug delivery systems. There are number of reasons for the intense interest in new systems. First recognition of the possibility of repatenting successful drugs by applying the concepts and techniques of controlled release drug delivery systems, coupled with increasing expense in bringing new drug entities to market, has encouraged the development of new drug delivery systems. Second, new systems are needed to deliver the novel, genetically engineered pharmaceuticals to their sites of action without incurring significant immunogenicity or biological inactivation. Third, treating enzyme deficient diseases and cancer therapies can be improved by better targeting. Finally, therapeutic efficacy and safety of drugs, administered by conventional methods, can be improved by more precise spatial and temporal placement with in the body, thereby reducing both the size and number of doses. While rate-controlled release drug delivery systems are capable of delivering a drug at some predetermine rate either systemically or locally for a specified period of time, they do so with virtually no controlled over the fate of drug once it enters the body.¹

The administration of conventional oral dosage forms like tablets, capsules, liquids orals of drugs suffers a setback due to problem of gastro intestinal tract absorption, local irritation, dilution of drug strength, liver first pass metabolism, degradation of drug by gastro intestinal tract enzymes, the protein binding of drugs at an absorption surface and local toxicity. The bioavailability as well as duration of action is reduced which requires frequent administration, which in turn is associated with the problem of patients compliance to therapy and the economy of the treatment.

Parenteral route is preffered route of administration for moderate to severe complication, even though patients compliance are rather low for this mode of drug delivery as it is invasive drug delivery technique, requiring frequent pricking with needle. All conventional dosage form except intravenous infusion, follow second order kinetic.²

Administration of drugs in conventional dosage form require large dose, frequent administration and lack extended duration, with chances of toxicity. While in controlled
drug delivery devices there is efficient utilization of drug, desired extended duration, with very low chances of toxicity, facilitating enhanced complication of patient, leading to better management of therapeutics. The efficacious use of drug influences cost factor economy of therapy too.

While most drugs are administered orally, these are numerous advantages to the transdermal route. These advantages include the potential for sustained release, controlled input kinetics, improved patient compliance and avoidance of first-pass metabolism in the gastrointestinal tract. However human skin is very effective barrier and severely limits the transdermal delivery of drugs.\(^3\)

Recently a popular approach for improving transdermal drug delivery involves the use of penetration enhancers which penetrate into the skin to reversibly reduce the barrier resistance. Skin penetration enhancement technique have been developed to improve bioavailability and increase the range of drugs for which topical and transdermal delivery is viable option.\(^4-6\)

There are various approaches in formulating transdermal drug delivery systems such as, membrane permeation controlled transdermal drug delivery system, adhesive dispersion type transdermal drug delivery system, matrix dispersion type transdermal drug delivery system, microreservoir dissolution controlled transdermal drug delivery systems.\(^7\)

**Advantages of transdermal drug delivery system**\(^8\)

- This approach is useful when oral administration is to be avoided or contraindicated.
- To provide predictable activity over extended period of time
- By pass- hepatic first pass effect a gastro-intestinal incompatibilities.
- Improve the patient compliance by reducing the frequency of dosage form.
- Controlled administration of drug with narrow therapeutic index i.e. enhance therapeutic efficacy.
- Provide suitability for self administration.
• Ability to easily terminate the medication as needed by simple removing the drug delivery device from the skin surface
• Reduce side effect of drugs.
• Achieving controlled plasma level of very potent drugs.
• Avoidance of risk and inconvenience of intravenous therapy
• Avoid chemical instability in GI environment.

Disadvantages of transdermal drug delivery system-9

• Transdermal patches may not added to all types of skin.
• Unsuitable for drugs that irritate or sensitize the skin.
• Limited drug permeability of skin.
• Useful for only low doses of drugs.