A REVIEW ON TRANSDERMAL DRUG DELIVERY SYSTEM

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ABSTRACT
Topically applied drugs are transdermally administered. A transdermal patch may be anything of various sizes and dosages for delivery of the active ingredient to the system through the skin barrier; it may be able to prevent first-pass impact. By using a transdermal delivery method instead of an oral, topical, intravenous, or intravascular medicine, the benefit is that the medication is provided to the patient in a controlled manner, such as through a porous membranes or thin layers of medication that are melted and then encapsulated and absorbed into the adhesive, and administered through the skin. We are currently trying to develop transdermal drugs which integrate herbal substances. Ayurvedic herbal drug formulation can therefore be considered a safe, time-tested, as well as reliable. Usage of herbal plant-based active ingredients for transdermal film permeation A strong overall conclusion was reached that well-known ayurvedic substances can be obtained through modern pharmaceutical processing methods.

INTRODUCTION
Today about 74% of the medications administered are administered parenterally and do not have as much effect as prescribed. According to such theories, transdermal drug delivery systems would be in a better position to advance such protagonists. Recent drug dosage types have promoted the advancement of the use of transdermal delivery systems (TDDS). It should be noted that the cheaper transdermal dosage forms are becoming common, particularly because of their comparative advantages. Some of the possible advantages of transdermal drug administration include improved bioavailability, more uniform plasma levels, painless, and quick removal of the patch, as well as flexible and simplified end. One of
the two major issues with oral delivery types including tablets and capsules is that they suffer from the drug's effect on the GI system, where the drugs undergo a mechanism known as first-pass digestion, meaning that they get absorbed into the bloodstream and then the liver. Oral route has several additional disadvantages including poor taste, foul smell, and colour. These additional issues are emerging with the treatment; this is becoming a concern. Patients often rebel against treatment. TDDS (Tidorative drug delivery system) drugs display their effects for consistent duration and TDIU (Transdermal drug administration) is a nonirritating and noninvasive operation. Systemic drug administration can be more appealing if used in combination with various creative techniques. Examples of TDDSs: It is critical to choose the right skin delivery system (TDDS) when making dosage for a transdermal medication (Transdermal dose) that takes a dose directly to the skin and delivers the right amount of medication (therapeutically-effective amount) TDDSs are considered critical when selecting the right dosage type for transdermally, which carries the appropriate amount of the therapeutic dose directly to the skin. Some multi-dose medicines have many issues, such as first pass metabolism. TDDS has taken it out. When formulating transdermal dose, we are trying to ensure that as much of the medication is distributed through the skin through the body as possible and at the same time, while trying to reduce skin retention and metabolism of the drug. or continuous distribution of transdermal systems (CDTs) for transdermal administration, go to the skin and flow out in a controlled fashion to circulation the transdermal route of administration is regarded as a safe and efficient means of delivering drugs both locally and systemically. And thus, various forms of this type of novel drug delivery method enable constant medication delivery as well as frequent drug dosing and substance injection without the occurrence of adverse effects including pulsing which is particularly valuable when a drug has a short half-life in the body. Transdermal administration of the drug not only provides constant but continuous delivery which results in fewer undesirable side effects. Several advantages of transdermal delivery include the limited hepatic first pass metabolism, helping to increase the plasma drug levels, and facilitating therapeutic and maintenance effectiveness.

**Advantage of transdermal**

1) It can be used as an alternative for nauseated or unconscious patients.

2) Patients having gastrointestinal problems can be given drugs through TDDS as there will be no direct. Contact between drug and stomach.

3) Like intravenous infusion, it also gives constant plasma level.
4) If toxicity develops from TDDS, patch can be removed easily.
5) It is very convenience as application of drug is very easy.
6) It eliminates first pass mechanism.
7) It reduces systemic drug interactions

Disadvantage of transdermal
1. Many hydrophilic drugs cannot pass or very slowly permeates the skin.
2. Many problems like itching, edema, erythema etc. may be seen due to patches.
3. The barrier function of the skin may change from person to person, or with ages or with different sites on same person.
4. There may be some possibility of irritation at the site of drug administration.
5. Uneconomic system of drug delivery.
6. It is not use in acute condition, only used in chronic conditions.
7. TDDS is not compatible with ionic drugs.
8. Dumping of dose may occur.

Transdermal Routes and Drug delivery prospects

Skin
It is the largest component of the body's integumentary system: the skin. Human skin also has seven distinct layers of ectoderm tissue, much like pig skin. There are two distinct styles of skin, glabrous and hairy. Its other functions include insulating the body heat, sensation, synthesis of vitamin D, and preserving B folates, all of which are supported by skin. When the skin is severely damaged, it forms scar tissue, making it difficult to give it a new shape. Sometimes it has faded and discoloured. Humans have numerous skin bacteria of over a wide range of moisture levels and bacterium species at different levels of population.

Anatomy of skin
Skin prevents the entire surface of the body, whether it is bacteria-free or on the outside of the body, from being pathogen and harm from the environment. In comparison to the total body surface area, the skin is the largest organ, being about 2 mm thick and weighing about six pounds per square metre. They claim that The fabric protects the body from fire, light, injury, and infection.
It also serves to maintain temperature, collects information from the outside world, contains water, stores fat, and plays a vital role in the immune system. The colour, thickness, texture, and degree of its turgor vary from person to person. The two basic skin types are coarse and smooth, which is found on areas that are involved in significant amounts of rubbing, including the palms of the hands, and thin and hairless. These two layers consist of fatty tissue that wrap around a third fatty layer. Functionally, they can be thought of as three layers. Melanin-producing melanocytes make up the epidermis, the second layer (located under the epidermis) is called the dermis; it has skin glands of various types and in most areas is called to be nerve endings, oil glands, and fine hair follicles. A fatty coating protects the skin between the epidermis and dermis.

**Epidermis**

The epidermis is the skin's barrier to the outside world. The skin's epidermis is just 0.05mm thick on the eyelids, 0.5mm on the bottoms of the feet, and 1mm on the palms and soles. Melanocytes (skin's organ), Merkel's cells (an immune cell in the skin), and sensory nerves are all located in the epidermis. These five layers of the epidermis build up to rebuild the skin's surface over time.
Fig. 2: Anatomy of epidermis.

Types of traniermal patches

A. Single layer drug in adhesive
In this type, the adhesive layer is the one with the active agent. Although it holds different layers together, it releases the drug to the system. The temporary adhesive sheet is wrapped around the permanent liner and a temporary backing.

B. Multi-layer drug in adhesive
This release is very close to the single but it's for an adhesive. A portion of the medication is released by the adhesive sheet. The temporary/permanent backing is found on all the patches as well.

C. Vapour patch
This form of patch holds different layers together as well as an adhesive vapour. Vapour patches are widely used for releasing essential oils in a vapour. You can also get other forms of vapour patches which help you fall asleep better and lower the harmful effects of smoking.

Various methods for preparation tdds

A. Asymmetric TPEX membrane method
To produce this concave 1cm diameter heat sealable polyester (type 1009, 3m) which the asymmetric membrane is disposed of, overfilled with TPX [poly(4-methyl-1-1-ene)] and then sealed.
B. Circular teflon mould method

Various polymeric solutions are used in an organic solvent. Half the quantity of an organic solvent First, 20% enhancers are dissolved in the organic solvent, and then added to the other 80% solution. As a plasticizer, di-DBP is used in pharmaceuticals. kOnce the complete amount of contents is prepared, it is to be poured into a Teflon Mold. Moors have to be mounted on a flat surface and covered with a sealed funnel in a laminar flow hood to operate in a circulation of 0.5 metres per second for (centimetres per second) of pressurised solvent to be able to prevent vaporisation the solvent is allowed to evaporate for one day, after which it is allowed to sublimate They should be preserved in desiccators, with a relative humidity of 25% ± 0.5% for 48 hours to reduce any possible ageing effects on the dried films before scanning. If an order is placed, the film must be reviewed within one week.

C. Mercury substrate method

The medicine is added to a polymer solution and a plasticizer mixture. Which should be stirred for 10-15 minutes to mix all and put in a reservoir. Eventually, the homogenised dispersion is poured onto a flat surface and left undisturbed to ensure an even application of the solution.

CONCLUSION

This article presents essential insight on transdermal drug delivery techniques and processes. This knowledge indicates that TDDS have vast skills, which could be put to use in both hydrophilic and hydrophobic ways for developing new drugs. In order to better understand the interactions of these drugs, a deeper understanding of both biologicals and polymers is needed. In terms of drug delivery systems, it is the next generation of operation. The aim of this research article was to bring new excitement to the pharmaceutical scientists to develop new formulations of old drugs. In addition, new delivery forms are necessary in order to improve the drug's performance by adjusting dosage, penetration, administration to the desired location, and potential delivery are critical. The transdermal drug delivery targets are given by these developments. The ultimate measure that can be used to judge an innovative method is when it is seen in action in the real world.