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Review Article

Route of Drug Delivers: An Updated Review

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ABSTRACT

Route of delivers means a way or path by which any medicament is introduced to our body for absorption so that it may produce its action for which it was taken there are many routes of deliver like oral, parenteral, topical, sublingual etc. selection of route of deliver depends on its urgency and efficacy. the route of deliver is chosen may have a profound effect upon the speed and efficiency with the drug act. systemic absorption of a drug depending on physiochemical properties, drug delivery method by which a drug is administered to achieve a specific therapeutic effect in humans or animals for the treatment of disease. Drugs are effective only if they reach their site of action. the route of administration is the way through which the dosage from is administered into the body for treatment of various diseases and disorder, this is an attempt for the initial of field to familiarize with the route of administrations with their significances.

Keywords: Drug Delivery, Therapeutic effect, Absorption, Physiochemical properties, Urgency, Efficacy

INTRODUCTION

Route of deliver is an important factor that influences the absorption of a drug**.** The interval between administration and onset of action is determined administration. Biological lag is the interval of a drug and development of response. Drugs have long been used to improve health and extend lives. The practice of drug delivery has changed dramatically in the past few decades and even greater changes are anticipated in the near future. Biomedical engineers have contributed substantially to our understanding of the physiological barriers to efficient drug delivery, such as transport in the circulatory system and drug movement through cells and tissues; they have also contributed to the development several new modes of drug delivery that have entered clinical practice. Oral and intervenous administration are usually classified by the location where the substance is applied. Common examples include oral and intravenous administration. Routes can also be classified based on where the target of action is. The action through local (local), antral (system-wide effect, but distributed through the gastrointestinal tract), or parenteral (systemic

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action, but can be distributed through routes other than the Gastric intenstine). The Oral and intravenous administration and dosage form are feature of drug delivery.

TYPES OF DRUG DELIVERS

1] SUBLINGUAL DELIVER

Sublingual and buccal medication drug dilevers are two different ways of giving medication by mouth. Sublingual rout delivers involves placing a drug under your tongue to dissolve and absorb into your blood through the tissue there. Buccal rout delivers involves placing a drug between your gums and cheek, where it also dissolves and is absorbed into your blood. Both sublingual and buccal drugs come in tablets, films, or sprays.[1]

Glyceryl trinitrate (or nitroglycerin) undergoes extensive hepatic presystemic metabolism when given orally, and is therefore usually given by the sublingual route, by which it is well absorbed and rapidly taken up into the circulation. Buccal rout delivers has a similar effect, and this route is used for more prolonged action over a few hours. When given intravenously, there is drug breakdown by the cells of the vascular endothelium.[2] Summary, Allergen-specific immunotherapy has been used for more than 100 years to treat patients with allergic conditions. Treatment by the sublingual route is becoming increasingly popular in Europe and is now being adopted in the United States. SLIT appears to be as effective as SCIT for allergic rhinitis and is more convenient for patients.[3] Absorption is defined as the translocation of drug from its site of rout delivers into the systemic circulation. Drugs delivers extravascularly, by the oral, sublingual, or intramuscular routes, must cross several membranes to reach the systemic circulation before distribution to their sites of action.[4]

2] RECTAL DELIVER

Drug delivers medication per rectum can be the most appropriate route for some patients may not always be considered by health professionals. Cultural sensitivities, as well as misinformation regarding insertion methods, may be barriers to the practice.[5] Rectal route drug delivers of sedative drugs with suppositories has a limited history in pediatric dentistry. Drugs delivers through this route are absorbed through two different vascular systems, one of which delivers agents to the liver while the second bypasses the liver. As a result, wide variations of bioavailability are seen after rectaldelivers.[6] Rectal drug delivers is frequently used for pediatric patients. Parenteral and rectal routes of drug delivers are preferred when quick therapeutic response is required. Rectally delivering drugs are found to achieve better plasma levels and therapeutic effectiveness when compared with orally or intramuscularly administered drugs of similar dose.[7] Rectal rout of drug delivers of therapies is a highly efficient treatment approach. It allows for diffusion of a high concentration of therapeutic elements, avoiding first-pass hepatic metabolism and dilution through global circulation and distribution.[8]

3] TOPICAL DELIVER

Topical drug delivers involves application of the drug primarily to elicit local effects at the site of application and to avoid systemic effects. Topical applications of drugs are becoming increasingly the most common used routes of drug delivers , thanks to the advantageous features of transdermal and dermal routes. Colloidal drug delivery systems play an important role in the field of transdermal drug delivery systems. Classic liposomes, but above all, ethosomes, transferosomes and niosomes represent the present and the future of drug delivery for the treatment of skin diseases.[9] Topical drug delivers of steroids is not commonly used for the treatment of DME, as penetration into the posterior segment is limited, and thus therapeutic efficacy has been inadequate. Some clinicians recommend a trial of dexamethasone drops before intravitreal injection of steroids, to determine whether the patient is likely to develop IOP elevation (known as a “steroid response”.[10] Adverse Effects - Topical application of polymyxins may cause sensitization, and i.m. drug delivers can produce pain at the site of injection, flushing, and other signs of histamine release. The most common adverse effect associated with the systemic use of polymyxins is a dose-related nephrotoxicity.[11]

Topical drug delivers of the drug is employed to treat anterior segment diseases, most often in the form of eye drops. For this route, the site of action is generally the different layers of the conjunctiva, cornea, sclera, and other anterior segment tissues like iris and ciliary body (anterior uvea).[12]

4] PARENTERAL DELIVER

The parenteral route (also referred to as injection route) is the fastest and the second commonest route delivers. The term parenteral is made up of two words – par meaning beyond and enteral meaning intestine.[13] Parenteral route of drug delivers is the route of choice for drugs that have poor absorption in the GIT and drugs like insulin which are unstable in the gastrointestinal tract (GIT) and/or that are unstable in the GIT (e.g. insulin, heparin).[14] Parenteral routes could be used in unconscious, uncooperative, and vomiting patient or under circumstances that require rapid onset of action.[15] Parenteral drug delivers is preferred at times over other drug-delivers routes,

such as in emergency situations of cardiac arrest and anaphylactic shock (Shi et al., 2009). This type of drug delivers route exhibits several advantages, such as first-pass metabolism avoidance, better bioavailability, and reliable dosage.[16] Parenteral therapy (which may be i.m. or i.v.) is preferred for therapy of serious infections because high therapeutic concentrations are achieved reliably and rapidly.[17] Parenteral medications may cause anaphylaxis. Although it varies in severity, anaphylaxis is the most severe of the immediate hypersensitivity reactions. Anaphylactic shock refers to the complete cardiovascular collapse that may result.[18] Parenteral drug delivers of penicillin G is the preferred treatment for all stages of syphilis, whose goal is to eliminate the microbe, although tetracyclines or erythromycin are alternatives when penicillin allergy is a concern. Parenteral drug delivers of penicillin G is indicated for pregnant women, even if desensitization of allergy is necessary.[19] Parenteral drugs, which are drug delivers by non-oral means, such as through injection or infusion, may be a small molecule or biologic. Increases in parenteral drug development is important for related manufacturing services and ingredients

5] INTRAVENOUS DELIVER

Some medications must be given by an intravenous (IV) injection or infusion. This means they're sent directly into your vein using a needle or tube. In fact, the term "intravenous" means "into the vein."[20]

An intramuscular injection is a technique used to deliver a medication deep into the muscles. This allows the medication to be absorbed into the bloodstream quickly. You may have received an intramuscular injection at a doctor's office the last time you got a vaccine, like the flu shot.[21] If you have severe pain and haven't found relief with certain medications, you may have other options. For example, Dilaudid and morphine are two prescription drugs used to treat pain after other medications haven't worked.[22] Intravenous rout delivers of sodium nitroprusside, a vasodilator, rapidly decreases blood pressure and reduces afterload. The effects of nitroprusside are evident within minutes of initiating the i.v. infusion and dissipate within 10 min following termination of delivers. Sodium nitroprusside is used in hypertensive crises, to produce controlled hypotension to reduce bleeding during surgery and in acute congestive heart failure.[23] Intravenous drug delivers (in the treatment of ureteric colic) is effective and well tolerated. However, in 90% of patients who receive slow (5 minutes) intravenous injection, hypertension, nausea, vertigo, vomiting, and peptic ulcer symptoms have been documented.[24]

Intravenous injection is the simplest and least invasive method among currently available methods of cardiac gene delivery. In rodents, injection into the tail vein results in successful cardiac gene expression. However, as of today, application of this method is feasible only in small animals, mostly due to limited cardiac specificity.[25] Intravenous delivers bypasses absorption barriers. It is potentially the most hazardous route of delivers as a high concentration of drug is delivered to organs as rapidly as the rate of injection, which may elicit toxic effects. Intravenous drug delivers is used primarily where a rapid onset of action is required (e.g. anesthesia, emergency medicine).[26]

6] VAGINAL DELIVER

Intravaginal drug deliver is a route of drug deliver where the substance is applied inside the vagina. Pharmacologically, it has the potential advantage to result in effects primarily in the vagina or nearby structures (such as the vaginal portion of cervix) with limited systemic adverse effects compared to other routes of drug deliver.[27] Formulation methods include vaginal tablets, vaginal cream, vaginal gel, vaginal suppository and vaginal ring.[28]

Medicines primarily delivered by intravaginal drug deliver include vaginally drug deliver estrogens and progestogens (a group of hormones including progesterone), and antibacterials and antifungals to treat bacterial vaginosis and yeast infections respectively.[29]

Medicines may also be drug deliver intravaginally as an alternative to oral route in the case of nausea or other digestive problems.[30]

7] ORAL DELIVER

Oral drug deliver is a route of drug deliver where a substance is taken through the mouth. Per os abbreviated to P.O. is sometimes used as a direction for medication to be taken orally.[31] Many medications are taken orally because they are intended to have a systemic effect, reaching different parts of the body via the blood stream.[32] Many drugs can be deliver orally as liquids, capsules, tablets, or chewable tablets. Because the oral route is the most convenient and usually the safest and least expensive, it is the one most often used. However, it has limitations because of the way a drug typically moves through the digestive tract. For drugs deliver orally, absorption may begin in the mouth and stomach.[33] This is the most common and easiest route of drug deliver where drugs are given by mouth. Dosage forms rout deliver orally include tablets, capsules, syrups, effervescent powders, elixirs, and emulsions.[34]

8] NASAL DELIVER

Nasal rout deliver is a route of deliver in which drugs are deliver through the nose. It can be a form of either topical deliver or systemic deliver, as the drugs thus locally delivered can go on to have either purely local or systemic effects.[35] Nasal sprays are locally acting drugs such as decongestants for cold and allergy treatment, whose systemic effects are usually minimal.[36] Examples of systemically active drugs available as nasal sprays are migraine drugs, rescue medications for seizure emergencies, nicotine replacement, and hormone treatments.[37] The BBB effectively restricts the transfer of hydrophilic compounds from the vascular compartment to the brain tissue. In contrast to the other tissues, no bulk flow occurs across the capillary walls due to tight junctions between the cells.[38] One such approach entails the delivery of drugs via the nasal route. There is growing scientific support that delivery of drugs via the nasal route may result in higher concentrations of drugs that can cross the BBB.[39]

9] SKIN DELIVER

The skin is the largest organ of the body and its main function is to protect the organism against undesirable effects of the environment. The skin is composed of three different layers: epidermis, dermis and hypodermis. The epidermis contains the stratum corneum, the uppermost layer of the epidermis, that acts as the barrier function of the skin due to its very high density and its low hydration.[40] The hypodermis acts as a heat insulator, a shock absorber, and an energy storage region. There are also several appendages in the skin: hair follicles, sebaceous, sweat glands and nails. The skin properties play an important role to allow penetration of topically applied drugs or substances into the skin. Drug permeation through the skin include the diffusion through the intact epidermis and the skin appendages. In this chapter we reviewed structure, immunological and electrical properties, penetration routes of drugs throughout skin, types of skin and the most common skin disorders that affect humans.[41] The skin is the largest organ of the body and its main function is to protect the organism against undesirable effects of the environment. The skin is composed of three different layers: epidermis, dermis and hypodermis. The epidermis contains the stratum corneum, the uppermost layer of the epidermis, that acts as the barrier function of the skin due to its very high density and its low hydration. The dermis is an extensive vascular network providing skin nutrition, repair, thermal regulation and immune response.[42]

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