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METHODS OF ADMINISTRATION OF DRUGS INTO THE ORGANISM

Abduxaliqova Diyora

Teacher of public health technical college named after
Republic No.1 Abu Ali Ibn Sino

Annotation: The methods of drug administration refer to the various routes by which medications are delivered into the body to achieve a therapeutic effect. These methods are broadly classified into enteral, parenteral, and other specialized routes. Enteral methods involve the gastrointestinal tract, such as oral and rectal administration. Parenteral methods bypass the digestive system and include intravenous, intramuscular, subcutaneous, and intradermal injections. Other routes include topical, transdermal, inhalation, intranasal, ophthalmic, otic, and vaginal administration. The choice of route depends on factors like drug properties, desired speed of action, patient condition, and site of action. Each method has its advantages, limitations, and specific applications in clinical practice.

Key Words: Drug administration, Enteral route, Parenteral route, Oral administration, Intravenous injection.

The rate of absorption, strength and duration of action of drugs depend on the route by which they are administered to the body. The method of administering drugs to the patient's body is selected depending on his condition, the physicochemical properties of the drugs and the duration of their action, drugs are administered in two ways.

1. Enteral method - drugs are administered through the gastrointestinal tract.
2. Parenteral method - drugs are administered from the gastrointestinal tract through external routes.

With enteral administration, drugs are administered sublingually, into the mouth, duodenum, rectum. The administration of drugs under the tongue is called the sublingual route. This method is not used at all in the treatment of young children. When a drug is placed under the tongue, due to the weak activity of the enzymes in the oral cavity, the drug is practically not absorbed, the drug under the tongue is not affected by gastrointestinal enzymes, is not changed in the liver, is absorbed at the site of administration, and has a general effect. In this method, some drugs, mainly nitroglycerin, methyltestosterone, pregnenol, etc., are administered, which are quickly absorbed into the blood (there are a lot of blood vessels under the tongue), and the effect begins quickly. Oral administration is the most common, convenient, easy and natural route. The patient can take the drug without assistance, the smell of the administered substance should not be unpleasant, and it should not have a negative effect on the mucous membranes. The absorption of alcohol, potassium, iodide, and barbiturates begins from the gastric mucosa. Substances are absorbed mainly through the small intestine, because blood circulates well in the small intestine. The rate of absorption depends on the type, form of the drug taken, and whether it is taken before or after a meal. Solutions, especially alcoholic solutions, are



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absorbed somewhat faster than powdered drugs (powders). When the drug is taken on an empty stomach, it is absorbed faster and has a stronger effect than drugs taken after a meal. Duodenal administration - in order to create a high concentration of drug substances in the intestine, substances are administered through a probe into the duodenum. Usually, this method is used to treat liver diseases. For example, a solution of magnesium sulfate is administered directly into the duodenum while warm, sometimes this method is also used when prescribing emetic drugs. Rectal administration - this method is used when oral administration of drugs is not possible, in the treatment of mental patients, when the patient is unconscious, when there are changes in the esophagus or stomach, when using drugs that are broken down by the action of gastrointestinal enzymes. In this way, various enveloping substances (starch, starch glue) prepared in the form of mucus are applied to the aqueous solution or mixture, and enemas are made for oily drugs.

Medicinal substances are inserted into the rectum in the form of suppositories. When using this method, the substances are quickly absorbed into the blood, that is, within 7*10 minutes, their main part passes directly into the inferior vena cava through the hemorrhoidal veins, acting faster and more strongly, with this method, some drugs are prescribed 3/4-1/2 times less than those administered orally. Substances administered rectally can have a local effect on the mucous membranes of the rectum and colon, as well as on nearby organs.

Parenteral administration method - Inhalation (inhalation - breathing) is a method of administration through the respiratory tract, vaporous and gaseous substances enter the body through inhalation, are absorbed from the lungs into the blood, the effect begins quickly and is strong, because the absorption surface of the lungs is very large (in adults, it is equal to 10 m²); the alveoli of the lungs absorb gases very quickly. Drugs administered by inhalation pass into the blood without reaching the liver, practically do not change in the body. The method of administration through the skin mainly involves the reflex and partially local effect of drugs, this method uses ointments, pastes, liniments, as well as alcoholic or aqueous solutions, mixtures and children's sprays. When the epidermis of the skin is injured, substances are absorbed quickly. Alcohol, phenol, chloroform are well absorbed through the skin. Children's skin is much thinner, so some drugs can be quickly absorbed into the blood through the skin. For example, if methyl salicylate liniment is applied to a child's skin, it can be detected in the blood after 10-15 minutes. If boric acid is sprayed on wet skin, it is quickly absorbed into the blood and can poison the child's body.

The method of administration through the mucous membranes is used to affect the mucous membranes of the nose, throat, eyes, renal pelvis, and vagina. Many medicinal substances are absorbed into the blood through the mucous membranes of the nose, throat, and eyes, so drops containing toxic or potent substances can also have a general effect.

Medicinal substances are also rapidly absorbed into the blood from the mucous membranes of the bronchi and lungs. Substances are also rapidly absorbed through the mucous membranes of the urinary tract, ureters, and renal pelvis; absorption of medicinal substances through the mucous membranes of the uterus, vagina, and bladder is slow, but

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fats and fatty substances are absorbed quickly. This should be taken into account when prescribing drugs for vaginal douching in gynecology.

The method of administration through serous layers is used to administer drugs in case of injuries to the abdominal organs and in some diseases of the lungs. Serous layers (peritoneum, pleura, pericardium) have a strong absorbent property, and drugs are absorbed faster from the peritoneum than from the pleura.

Subcutaneous administration mainly uses aqueous solutions of drugs, the effect begins after 10-15 minutes, the absorption period is shorter than when administered orally, and the effect is 2-3 times stronger than when administered orally in the same amount. It is not recommended to administer suspensions or very viscous and slowly absorbed oily solutions subcutaneously, as they can cause infiltration and necrosis of tissues.

Intramuscular injection involves the injection of aqueous and oily solutions, as well as suspensions of drugs. Since the muscles are better supplied with blood than the subcutaneous tissue, drugs are absorbed into the muscles faster. Intravenous injection involves the injection of drugs directly into the bloodstream, using a solution of drugs that do not precipitate, coagulate, or cause hemolysis when mixed with blood. The drug must be injected into the vein slowly, otherwise its concentration in the blood can suddenly increase and have a toxic effect on the body. The effect of the drug begins very quickly, often immediately after injection, and the duration of the effect is shorter than when injected subcutaneously and intramuscularly. Intracerebral injection - drugs that do not penetrate the blood-brain barrier well are administered subarachnoid, peridural. It is often used to temporarily relieve pain - for spinal anesthesia and for the administration of some antibiotics in complicated cases of meningitis.

Drugs are administered directly to the heart, joints, and bones. Substances can be administered by electric current, iontophoresis, or intravenous injection. There are many parenteral methods, but when drugs are administered parenterally, it is usually administered subcutaneously, intramuscularly, or intravenously, as other routes of administration are used relatively rarely.

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