

METHODOLOGICAL PRINCIPLES OF TEACHING BIOPHARMACY IN HIGHER MEDICAL EDUCATIONAL INSTITUTIONS

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Abstract. *The article due to today's achievements in the field of pharmaceuticals, methodological foundations and pedagogical necessity of teaching biopharmacy in higher medical educational institutions. Also, the contribution of Abu Ali ibn Sina to the science of biopharmaceutics is covered in this article.*

Keywords: *pharmaceutics, medicine, innovation, technology, medicine, student, higher education, methodology, pedagogical necessity.*

Introduction. Today, major reforms are being carried out in the field of medicine, including pharmaceuticals. On October 18, under the chairmanship of the President of the Republic of Uzbekistan Shavkat Mirziyoev, the achievements in this regard and the priority tasks to be carried out were determined at a meeting dedicated to the analysis of reforms in the field of further improving the health care system, increasing the quality and efficiency of medical services, strengthening the health of the population, and providing quality medicines. Credit resources in the amount of 250 million dollars have been allocated from the Development and Development Fund of Uzbekistan to master the production of new, high-tech products in the pharmaceutical sector. The implementation of more than 70 investment projects with a total value of nearly 400 million dollars has begun, and 33 of them will be launched this year. On the establishment of the free economic zones "Nukus-farm", "Zomin-farm", "Kosonsoy-farm", "Syrdaryo-farm", "Boysun-farm", "Bostonliq-farm" and "Parkent-farm" of the head of our state" The adoption of the decree serves, first of all, to develop the pharmaceutical industry in our country, to support manufacturers of pharmaceuticals and medical products, and to expand the possibilities of filling the domestic market of pharmaceuticals with high-quality drugs produced in our country. At the same time, it will further increase the volume of export of medicines and medical products. Consistent work in this direction has begun to bear fruit. For example, a 40% increase in the export of pharmaceutical products was achieved, and thanks to the introduction of high technologies, production efficiency per worker increased by 35%. The types of drugs produced by local pharmaceutical enterprises have exceeded 2,300.

Research Methodology. "Biopharmacy" is the theoretical basis of technology, which was first used in pharmacy in the 60s of the 20th century. According to the information in the literature, the term biopharmacy was used for the first time in 1961 by US scientists Levy and Wagner. A clear and complete expression of this term was given by the Academy of Scientific Pharmacy of the American Pharmaceutical Association in 1972. According to this, the main task of biopharmaceutics is to study the factors affecting the biological activity of drugs in humans and animals and, accordingly, to increase their therapeutic efficiency and reduce their side effects. For example, Hippocrates (460-370 BC) proved in practice that the activity of drugs depends on its type and preparation process, while Galen (130-200 BC) and Ibn Sina (980-1037 BC) also proved

that it depends on the level of fineness. So, biopharmaceutical factors began to be studied 3-5 thousand years ago. Based on these factors, Ibn Sina created the theoretical foundations and terminology of his knowledge of medicine. He was able to predict the therapeutic efficacy of the drugs based on the characteristics of the individual client and drugs.

Medicines were considered by Ibn Sina to be composed of two parts:

1-acting agent, 2-auxiliary substances. As auxiliaries, fillers, binders, emollients, viscosity-increasing stabilizers, odor and taste improvers, extenders, and coatings are used. Honey was often used for this purpose. Because Ibn Sina called honey "the crown of all medicines".

According to the above information, the concept of "biopharmacy" was not founded by the American scientists Levi and Wagner, but by our compatriot Ibn Sina. But it is inappropriate to consider them as the founders of biopharmacy just because the term "biopharmacy" was used by the above-mentioned scientists. When a drug enters the body, it undergoes complex processes, and then exerts its effects. The following is a simplified representation of the steps in this process:

Type of medicine

In the biofluid at the site of drug absorption

Drug substance (or its broken down parts) in blood or tissues

Excretion of drugs through the gastrointestinal tract, kidneys, lungs, skin glands.

The first stage includes processes from the type of drug taken to the release of the bioactive substance and its absorption to the desired organ.

In the second stage, the drug that has passed into the bioliquid is absorbed according to the laws of diffusion. Diffusion kinetics are influenced by pharmaceutical and physiological factors. Including pyroactivity, technological process, dissolution of drug type in liquid, disintegration, etc. Diffusion kinetics includes the nature and state of the tissue membrane, tissue enzyme activity. Absorption of drugs depends on the patient's age, gender, body condition.

In the third stage, physiological factors take the main place, that is, drug-or its metabolites are distributed in the body (blood, tissue).

In the fourth stage, the main biochemical factors in the movement of drugs in the body are observed. In this, the action and release of drugs or their metabolites in biochemistry takes place. Pharmaceutical factors greatly affect the rate of absorption of drugs into the body. These factors include chemical and physical states of drugs, excipients, drug type and route of administration, and effects of pharmaceutical processes.

Conclusion. The research of the above-mentioned factors in the form of introduction of drugs into the body, its action and effect is considered the basis of biopharmaceutics. This picture should be taken as general. Because other factors affect biopharmaceutics. Therefore, the relationship between drugs and their activity can be determined only by combining biopharmaceutics with pharmacokinetics.

Determining pharmacokinetics helps technologists design the right drug type. In recent years, biopharmaceutics is developing at a very fast pace, because the main work of all pharmaceutical universities and enterprises includes this field. Professors in this field I.S.Azgikhin, A.I.Tentsova and others are leading scientists. Let's consider the main factors that affect the rate of absorption of drugs and therapeutic efficiency. The basis of any medicinal substance is its chemical structure. This is influenced by the technological factors used for the preparation of the drug from this medicinal substance, the crystalline form of the substance, the degree of fineness, the solubility of auxiliary substances, etc.

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