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Physiological Accessibility of the Substances with Action Pharmacological

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Executive Summary

The definition physiological accessibility can be presented by the following formula: *PhA = C/Sx100 %*,

Where: PhA-physiological accessibility; C-quantity of substance with action pharmacological absorbed after prescription of the investigated pharmacological form; S-quantity of the substance with action pharmacological, which have absorbed after prescription of the standard pharmacological form.

The measuring of biological availability may be represented by the following formula: *BA = C/S x 100 %*,

Where: BA–biological availability of medicine, %; C-amount of the medicinal substance which absorbed after entering of the explored pharmacological form; S–amount of the medicinal substance which absorbed after entering of standard pharmacological form.

Relative bioavailability is one of the measures used to assess bioequivalence between two substances with action pharmacological, as it is the Test/Reference ratio of AUC. *Relative bioavailability=*$[AUC]_C \cdot dose_S / [AUC]_S \cdot dose_C$.

The maximum concentration of drug in plasma or serum (C_{max}) is also usually used to appreciate bioequivalence. When T_{max} is given, it refers to the time it takes for a drug to reach C_{max}. While mechanisms by which a formulation affects bioavailability and bioequivalence have been studied in substance with action pharmacological, formulation factors that influence bioavailability and bioequivalence in nutritional supplements appeals to pharmacological research substances with action pharmacological and interpretations.

Perspectives

Chirality is a universal property of nature, therefore, once man discovered this truth and understand its implications in the functioning of organisms, tried to copy and create new molecules with similar complexity, as can interact specifically with the world living.

Since the very beginning it was clear that microorganisms are capable of producing the most simple and efficient way desired molecules. The first observation of enantioselectivity (degree to which one enantiomer of a chiral compound is preferentially produced in a chemical reaction) belongs to Louis Pasteur, which of discovered in 1848 that an aqueous solution of ammonium tartrate racemic, enriched with nutrients, are formed much higher speed dextrorotatory enantiomer.

According IUPAC of organic stereoisomers "*molecules that are mirror images of one another are termed enantiomers and may be said to be enantiomeric*", and, "*when equal amounts of enantiomeric molecules are present together, the product is termed racemic independently of whether it is crystalline, liquid or gaseous*"[1]. Later He explained this by specific action of a fungus, *Penicillium glaucum*, on this enantiomer. He emitted theory which was subsequently proved to be correct that this stereoisomer specifically interact with a molecule key chiral produced by microorganism, which makes it possible to transformation.

Modern Pharmacology developed in twentieth century. There have been isolated and identified a number of naturally occurring substances with action pharmacological were prepared thousands of novel compounds, both natural and (semi-) synthetic, most chiral, and it was inserted into modern therapy a significant number of drugs. The chiral medicinal products have been strengthened as an increasingly important segment, of treatment of diseases. However, in 1987 substances with action pharmacological it is still used in a proportion of 88% in the form of a racemic mixture. Using pharmacologically active enantiomer was achieved only when other significant toxicity [2. A different attitude towards role of chirality in substances with action pharmacological development but started in eighties of the last century, with development of enantioselective reactions that involve analytical techniques, which allowed of stereoselective routes to synthetic methods. It is now mandatory to obtain and testing individual enantiomers of any new substance with action pharmacological (drug), from standpoint of pharmacology, therapeutic effect and toxicity, then make a complex analysis of individual enantiomers and optimal decision in each individual case, there was no single protocol analysis.

If the metabolism of the two enantiomers is by different enzymes which are either polymorphic or can be induced or inhibited, and especially if pharmacodynamics of enantiomers is different from the point of view enantiospecific effects of chiral compound quantitative or qualitative analysis is required [3]. A hypothesis was introduced by Tobert about 30 years ago: the use of a non-racemic mixture of stereoisomers as optimized substance with action pharmacological. One of the most important properties of a drug is able to release the active principle such that it reaches the site of action in an amount sufficient to achieve the desired therapeutic response. This property has been called physiological availability, bioavailability or bioavailability. The concept of bioavailability is specifically defined as the rate and extent of absorption of a substance with action pharmacological from the formulation into the systemic circulation. It is known that the therapeutic effect of a substance with action pharmacological is related to its blood or plasma concentration of the importance of the bioavailability of the drug therapy is that the rate and extent of absorption of the drug can affect the pharmacological response of the patient. It was considered that the therapeutic performance is ensured only by the existence of the amount declared substance with action pharmacological in the drug product. It has been found, however, that treatment failure due to variations in the bioavailability of the substance

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with action pharmacological, but rather some variability correlated to the patients [4].

There are many factors that can cause variations in bioavailability of a drug, factors that may be correlated with patient or pharmaceutical form. Factors correlated with formulation that can produce large differences in the bioavailability of oral solid drugs may be factors related to the substance with action pharmacological (chemical, physical or physico-chemical) factors related to the nature, quantity and reactivity excipients used or technological factors [5]. Evidently, the administration of a substance with action pharmacological in different pharmaceutical forms (granules, capsules, tablets, coated) will result in variations in the size and speed of absorption. Development of products in a reproducible bioavailability is related to determining the size and speed of absorption of substances with action pharmacological in pharmaceutical form [6. Same bioavailability of the two pharmaceutical products evaluated under standardized conditions in same group of healthy volunteers defines bioequivalence.

Determination of bioequivalence of generic products is compared with inventor products to ensure same quality of both biological types [7].

Existence bioequivalence of formulations of different manufacturers, which contain the same active ingredient, makes them to be considered interchangeable because it is expected to produce the same therapeutic effects. Kinetic processes (speed) following administration of the drug substance in the body in a certain way are defined by certain specific parameters determine the pharmacokinetic analysis [8]. The analysis is based on knowledge of concentrations of the substances with action pharmacological or active metabolites according to the past administration. Parameters derived from the analysis can then be used to characterize the pharmacokinetics of the substance, for comparing the quality of pharmaceutical products or to establish a scheme or individualization of treatment depending on the particular physiology of the body. In 1992 the FDA has regulated clear how chiral drug discovery we subsequently applied in other countries, including Europe and other countries [9]. These new regulations will likely result in the disappearance while racemic drugs. In this context, the development of stereoselective methods for obtaining chiral molecules structurally complex and sometimes extremely effective methods of separating the old and new chiral drugs is of paramount importance [10]. The second objective of the present work was to study and find ways biocatalytic resolution of the enantiomers of bioactive compounds.

Final Remarks

Bioavailability is the extent to which an ingested substance with action pharmacological is assimilated by the body tissues and used for its specific functions. The measure of physiological (biological) availability (PhA) is a ratio (in percentage) quantities of absorbed substance with action pharmacological prescribed in studied pharmacological form, to quantity of same substance with action pharmacological prescribed in same doze, but in form of standard pharmacological form. The physiological accessibility is defined by three ways: by excretion of substance with action pharmacological with urine; by definition of concentration of substance with action pharmacological in blood after unitary prescription; by definition of concentration of substance in blood after its repeated prescription. The parameter of biological availability grows out of interaction of pharmaceutical, physiological and biochemical factors. This makes biological accessibility of substance with action pharmacological necessary characteristic of medicine and pharmacy. The significant parameter is also relative bioavailability (RBA). It defines a relative degree of absorption of substance with action pharmacological from tested drug and a drug of comparison. Relative bioavailability is defined for various series of substance with action pharmacological at change of the "know-how" and for pharmacological forms. Relative bioavailability is defined for medical products at same ways of introduction, using data about a level of the contents of substance with action pharmacological in blood or its excretion with urine after disposable or repeated introduction. Relative bioavailability has the big practical value, because drugs containing same substances, but made by the different pharmaceutical enterprises, can differ by therapeutic efficiency that it is necessary to consider in a clinical practice.

But for this there was a concept bioequivalence. Biological availability (bioavailability) is a rate and extent to which a substance with action pharmacological is absorbed or is otherwise available to the treatment site in the body. In pharmacology, bioavailability is used to describe the fraction of an administered dose of unchanged substance with action pharmacological that reaches the systemic circulation, one of the principal pharmacokinetic properties of pharmacological forms. The relative bioavailability measures the bioavailability (estimated as the AUC) of a certain drug when compared with another formulation of the same substance with action pharmacological, usually an established standard, or through administration via a different route. When the standard consists of intravenously administered drug, this is known as absolute bioavailability. Relative bioavailability is extremely sensitive to substance with action pharmacological formulation.

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