

**SURVEY OF STATISTICAL METHODS APPLICATION  
FOR EXPERIMENTAL DATA ANALYSIS  
IN ACTUAL PHARMACEUTICAL STUDIES**

Bondarenko A. V., Budarina A. V., Gorishnya A. O.  
Scientific supervisor: assoc. prof. Nessonova M. N.  
National University of Pharmacy, Kharkiv, Ukraine  
saddymn@gmail.com

**Introduction.** Experiment is an essential part of a study of pharmaceutical preparations. It should be conducted in a stage of development and studying properties of new substances, in preclinical testing, clinical trials, etc. To process the data of experimental investigation and make conclusions, if it confirms or disproves a hypothesis of a researcher, methods of statistical analysis are used.

**Aim.** The purpose of the work is to study the current state of application of confirmatory statistical methods in Ukrainian pharmaceutical science.

**Materials and methods.** Reports about pharmaceutical preparations researches in scientific articles in Ukrainian specialized journals approved by the Ministry of Education and Science for publication of the results of dissertations on pharmaceutical sciences published during last two years (2015—2017) were considered. Publications were analyzed in terms of fitting the requirements of “Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly work in Medical Journals” from International Committee of Medical Journals Editors (ICMJE).

**Results and discussion.** We have studied 171 articles in Ukrainian scientific journals specialized in pharmaceutical science. 122 (71.35%) of them contain reports about researches of action or properties of different drugs and pharmaceutical preparations, which include statistical processing of data. Special attention was paid to aspects of statistical procedures application to describe experimental data and to approve conclusions made from the results of experiments.

In major part of the papers (111 reports, 90.98%) the feature of the drug under investigation was measured by some quantitative index, and was studied in several groups, so the results of its measurement were reported as “number  $\pm$  number”. Although such style of reporting implies certain statistical processing and evaluations, the explanation which statistical characteristics at least one of these numbers refers to were given in 31 (27.93%) publications only (in all of them the first number was calculated as arithmetic average, the second one means standard error in 13 works, standard deviation – in 4 publications, in 14 papers was not specified). Thus more than half of the reports (72.07%) do not meet the requirement from ICMJE, which says to “define statistical terms, abbreviations, and most symbols”. It also should be noticed that medians and quartiles as alternative characteristics of central tendency and variability of data were used only in 4 cases, although they are more preferable when sample distribution deviates from normality. As for normality, the mentioning that researchers pay attention to this property of distribution of data they obtain in their experiments was only in 10 papers, wherein pointing to statistical tests used to check the normality was done only in 4 of them. Obviously other reports cannot be regarded as those that satisfy the ICMJE’s “Recommendations...”, which ask to “describe statistical methods with enough detail to enable a knowledgeable reader with access to the original data to judge its appropriateness for the study and to verify the reported results”. It concerns even more to using statistical tests to confirm the significance of differences between groups. We mean, that expressions like “ $p < 0.05$ ” or “ $p < 0.01$ ” along with statements about proved difference between groups is observed in 94 articles out of 122 (i.e. in most of them), but in 39 (41.49%) was not any indication to the statistical method used to obtain these p-values, and explicit p-values were given in none of the publications. Among the reported methods the most popular were Student’s t-test, which was mentioned 29 times, and Mann-Whitney test, which was specified in 23 publications. It worth mentioning that Student’s t-test and Mann-Whitney U-test are two-samples criteria, but in most of studies comparisons were made for 4—5 groups. It is known that applying two-samples tests to comparisons of more than two groups causes the increase of type II error, which leads to hazard of discovering false significance of differences when it is not really observed, but information about applied corrections or special tests for multiple comparisons were present only in 7 papers.

15 reports contain information about studying qualitative features. In such cases proportions

(percentages) of feature occurrence in a sample were given. It should be pointed out that either standard errors, nor confidence intervals for the percentages were never calculated and reported, as well as mentioning about statistical tests applied to confirm prevalence of one proportion over the other (others) were made only twice (i.e. in 1.64% of cases).

**Conclusions.** Our study has shown, that reporting about application of statistical methods that are used to confirm the conclusions about properties and action of pharmaceutical preparations in Ukrainian scientific journals is rarely meet the requirements of ICMJE's recommendations. This situation needs to be improved in order to promote the national advances in pharmaceutical field for European scientific community and all over the world. We believe that acceptance of the ICMJE's "Recommendations..." (which includes not statistical aspects only, but general principles of best practice and ethical standards in the conduct and reporting of research) by Ukrainian pharmaceutical journals will make them more competitive and enable faster international integration of the Ukrainian pharmaceutical science.

## PRINCIPLE OF THE GOLDEN RATIO IN PLASTIC SURGERY

Chirva V. A.

Scientific supervisor: assist. Sheykina N. V.  
National University of Pharmacy, Kharkiv, Ukraine  
vikachirva99@gmail.com

**Introduction.** Plastic surgery and physical-aesthetic medicine in whole, is the most beautiful direction of medicine nowadays. The main task of plastic surgery is physical and psychological health of a person. The same principle is used in the plastic of vessels, gastrointestinal tract, orthopedics, etc. Actively developing, it is becoming more popular and in-demand, first of all, among those who need it: people who were suffered from accidents and among people who have physical disabilities from birth. Creating harmonical and attractive face and body is one of the most important tasks of aesthetic surgeons. But every surgeon knows that it is impossible to operate all on the same template, since there are no single true criteria for an ideal nose or breast. In order to give the beauty to a patient, and at the same time emphasize his personality the principle of the golden ratio is applied.

**Aim.** To study the role of the golden ratio rule in plastic surgery and it`s applying. To study the face parameters correspondence of different people to the golden ratio, in order to know whether people should to change themselves. To learn the secrets of appearance improving.

**Materials and methods.** In connection with the birth of the «Golden Ratio» rule, Egyptian priests should be mentioned, who first learned the amazing mystery of the golden ratio. It is on the principles of ideal proportions was built one of the wonders of the world - the Egyptian pyramids. At their base is a square, and the lateral face is an isosceles triangle with a right angle at the vertex and angles at the base of 45 degrees. In the pyramid, the side of the base refers to its height as 1.618 - this is the main number of the golden ratio, the Divine proportion or the number "fi". In 550 BC, the ancient Greek mathematician Pythagoras went to Egypt, and in the investigation analysis and calculation he managed to understand the principles of Egyptian pyramids building and to calculate the same number "phi".

One of the greatest painters of the whole world history, Leonardo da Vinci, also successfully used this secret. He realized that the closer the proportion of the figure and the person's face is to the value "fi", the more beautiful it is considered. It was on the principle of the golden ratio that the legendary Vitruvian man was constructed.

Well-known plastic surgeon Stephen R. Marquardt 25 years ago worked to make faces deformed from birth or as a result of accidents more attractive. Taking as a basis the works of Pythagoras and Leonardo da Vinci, he combined all knowledge of the golden ratio and deduced the formula of the ideal face. The nose in the profile and the full face is a triangle, in the beautiful face of the triangle's side is 1.618 times longer than its base. And when a smile appears on your face, the triangle becomes a pentagon. Marquardt combined all triangles and pentagons, took into account the ratio with the number of "fi" 1,618 and created a "beauty mask". There are four types of masks: face, face with a smile, profile, profile with a smile. All of them are universal – you can check the harmony of individuals, both men and women,