SEKCE OSTATNÍ FARMACEUTICKÉ VĚDY

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Čtvrtek 23. 4. 2015

(Nová posluchárna)

12:15 Název přednášky: **Analysis of self-medication with antibiotics in Kosovo**

Autor přednášky: Ardita Veseli
Katedra: Katedra sociální a klinické farmacie
Školitel: prof. PharmDr. Jiří Vlček, Ph.D.

12:30 Název přednášky: **Consistency of the semisolid preparations**

Autor přednášky: Anna Hánová
Katedra: Katedra farmaceutické technologie
Školitel: PharmDr. Eva Šnejdrová, Ph.D.

12:45 Název přednášky: **Yield stress of semisolid pharmaceutical preparations**

Autor přednášky: Marta Šmídová
Katedra: Katedra farmaceutické technologie
Školitel: PharmDr. Eva Šnejdrová, Ph.D.

13:00 Název přednášky: **Preparation of microparticles by microfluidic method**

Autor přednášky: Petra Husárová
Katedra: Katedra farmaceutické technologie
Školitel: doc. PharmDr. Zdeňka Šklubalová, Ph.D, Ing. Corine Tourné-Péteilh

13:15 Název přednášky: **Pharmaceutical Care and Continual Professional Development in Greece**

Autor přednášky: Eleftheria Karageorgiou
Katedra: Katedra sociální a klinické farmacie
Školitel: doc. RNDr. Josef Kolář, CSc.

13:30 Název přednášky: **The permeability and microstructure of model stratum corneum lipid membranes containing non-hydroxylated and (R)- and (S)-α-hydroxylated ceramides**

Autor přednášky: Michaela Šilarová
Katedra: Katedra anorganické a organické chemie
Školitel: doc. PharmDr. Kateřina Vávrová, Ph.D.

13:45 Přestávka

14:00 Název přednášky: **Ethics in pharmaceutical companies**

Autor přednášky: Šárka Nováková
Katedra: Katedra sociální a klinické farmacie
Školitel: PharmDr. Jan Kostřiba, Ph.D.

14:15 Název přednášky: **Influence of excipients on the mechanical properties of orodispersible tablets**

Autor přednášky: Zuzana Matoušková
Katedra: Katedra farmaceutické technologie
Školitel: doc. PharmDr. Zdeňka Šklubalová, Ph.D.

14:30 Název přednášky: **The analysis of the care of pharmacy clients with the risk of arterial hypertension**

Autor přednášky: Lada Kotlanová
Katedra: Katedra sociální a klinické farmacie
Školitel: PharmDr. Josef Malý, Ph.D.

14:45 Název přednášky: **Presence of drugs interactions in Czech population**

Autor přednášky: Petr Průša
Katedra: Katedra sociální a klinické farmacie
Školitel: MUDr. Michal Prokeš

15:00 Název přednášky: **Only one third of patients with COPD is fully adherent to inhalation therapy**

Autor přednášky: Hanna Hruzdova
Katedra: Katedra sociální a klinické farmacie
Školitel: Mgr. Tereza Toušková, PharmDr. Magda Vytřísalová, Ph.D.

Seznam abstraktů:

ANALYSIS OF SELF-MEDICATION WITH ANTIBIOTICS IN KOSOVO

Department of Social and Clinical Pharmacy, Faculty of Pharmacy in Hradec Králové, Charles University in Prague, Czech Republic

e-mail: veselia@faf.cuni.cz

Evidently, the irrational and overuse of antibiotics continues to be a significant problem in Kosovo despite the increased risks of antibiotic resistance and adverse drug reactions. The main aim of this study was to analyze the knowledge, attitude and practice towards self-medication with antibiotics among the population in Kosovo.

The study was conducted in a community pharmacy in Prishtina where a total of 300 patients participated. Data was collected through using a validated, self-administered questionnaire which was developed in English at the department of Social and Clinical pharmacy at Charles University, Faculty of Pharmacy in Hradec Kralove. This questionnaire was spread to two groups of patients: To every patient that visited the pharmacy and to patients who specifically wanted to purchase antibiotics.

The prevalence of non-prescription use was high. In the first group 76.8% of the patients reported using non-prescribed antibiotics while in the second group 47.6% of the patients did not present a prescription at the time of the purchase. Utilization of an old prescription was the most common source of non-prescribed antibiotic use. In both groups the most common reasons for antibiotic consumption were urinary inflammations, cough and influenza which were followed by gastrointestinal and gynecological inflammations. In the first group 73% of the patients stored antibiotics at home while in the second group 60.3% of the patients did the same. On the other hand the majority of the patients were not aware of antibiotic resistant bacteria and the fact that antibiotics can kill off normal flora as well.

Results showed that unfortunately self-medication with antibiotics is common in Kosovo, indicating that there is a need for educational campaigns which will help the public understand the proper antibiotic use and diminish the inappropriate consumption of antibiotics.

The study was supported by SVV 260 187.

CONSISTENCY OF THE SEMISOLID PREPARATIONS

Hánová A[1], Šnejdrová E[1]

[1] Department of Pharmaceutical Technology Faculty of Pharmacy in Hradec Králové, Charles University in Prague, Czech Republic

e-mail: hanovaa@faf.cuni.cz

Semi-solid preparations are intended for local or transdermal delivery of active substances, or for their emollient or protective action. They consist of a simple or compound base in which, usually, one or more active substances are dissolved or dispersed. The base is not inert carrier of an API but influences the effect of the preparation. Commonly used hydrophobic bases are yellow and white soft paraffin, purified mixture of semisolid saturated hydrocarbons obtained from petroleum. Only for these bases the measurement of consistency by penetrometry as control of quality is required in the pharmacopoeia. The question is why among all hydrophobic viscosifiers just only soft paraffin must be tested and how its consistency should be changed not to comply with pharmacopoeial requirement.

In our study, white soft paraffin was mixed either with liquid paraffin or with solid paraffin to change its consistency. The samples for penetrometry measurement were prepared either by methods A or method C according to Ph.Eur., and measured at 25±0.5°C. The consistency of the samples was significantly affected by the chosen method of preparation. The value of consistency of samples prepared in semisolid state (method A) is 215, the consistency of the samples prepared by melting (method C) is 143 i.e. by 44 % less. The addition of 10 % of liquid paraffin increased the value of consistency in 290, near to the upper pharmacopoeial limit in case of method A, while in case of method C the value of consistency was not influenced. The value of consistency of white soft paraffin with 10 % of solid paraffin was significantly decreased, samples with 20 % of solid paraffin prepared by melting even did not comply with pharmacopoeial requirement.

The result of the test of consistency by penetrometry i) can be influenced with method of preparation of the samples, ii) is required only for yellow and white soft paraffin, and iii) limit is in very wide range. Rheological characteristics as consistency coefficient and flow index, or yield stress and viscosity on yield stress can be suggested as more suitable and more useful.

The study was supported by SVV 260 183.

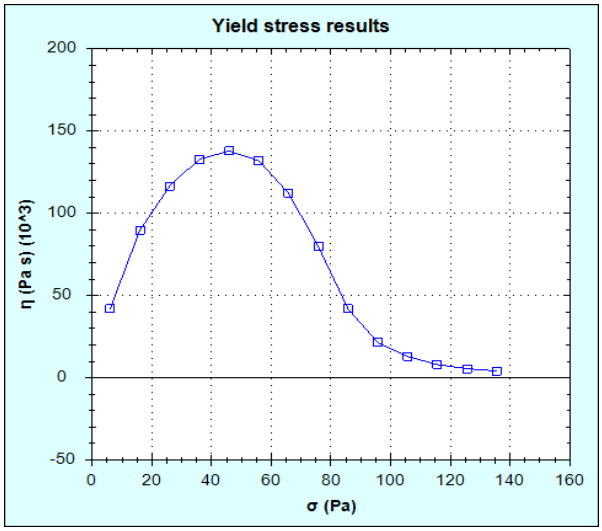
YIELD STRESS OF SEMISOLID PHARMACEUTICAL PREPARATIONS

Šmídová M[1], Šnejdrová E[1]

[1]Department of Pharmaceutical Technology, Faculty of Pharmacy in Hradec Králové, Charles University in Prague, Czech Republic

e-mail: smidovm8@faf.cuni.cz

Semisolid preparations (gels, ointments, creams) do not flow until the applied stress exceeds a certain critical stress, known as the yield stress. When the semisolid preparation is sheared at very low shear rates, in the range between 0.01-0.1s^{-1} and below a critical strain the system is subjected to work hardening. This is characteristic of solid-like behaviour. At a shear rate in the range of 0.8 of the critical shear rate the reinforcing structure will start to break down. This is the point where the instantaneous viscosity reaches a maximum. This maximum corresponds to a critical value of shear stress - the yield stress. The chart shows the dependence of viscosity on the shear stress. The yield stress of this sample is determined from the viscosity maximum.



Viscosity data for Paraffin soft white

The aim of this work was to use yield stress analysis as simple but more standard method of characterisation of consistency of ointments and gels in comparison to penetrometry. Yield stress by stress ramp of Paraffin soft white, Carbomer gel, Cellulose derivatives gels etc. were measured on Malvern Kinexus rheometer using a CP4°/40 cone geometry, at 25.0 °C, and shear stress range from 0.1 to 300 Pa. Values of yield stress and viscosity on yield stress were expressed and compared with previously determined parameters of Power Law Model and values of consistency measured by penetrometry.

The study is supported by SVV 260183.

PREPARATION OF MICROPARTICLES BY MICROFLUIDIC METHOD

Husárová P[1,2], Tourné-Péteilh C[2], Šklubalová Z[1]

[1] Department of Pharmaceutical Technology, Faculty of Pharmacy in Hradec Králové, Charles University in Prague, Czech Republic

[2] Department of Pharmaceutical Technology, Faculty of Pharmacy in Montpellier, Université de Montpellier, France

e-mail: husarovp@faf.cuni.cz

The aim of this work was to prepare hydrogel microparticles based on silated-hydroxypropyl methylcellulose (HPMC-Si). The microparticles are expected to be obtained by self-hardening of HPMC-Si from the microdroplets formed by the emulsification in the continuous phase.
The microparticles were prepared by microfluidic method. This method is based on phase separation of a droplet in a non-miscible continuous phase by using microchannels. A 3% w/w solution of HPMC-Si in the sodium hydroxide solution 0.2M (pH 13.2), the HEPES buffer (pH 3.5) and a fluorescent dye FITC-Si were utilized to form microparticles. Sesame oil was tested as a continuous phase.
In order to form microparticles of controlled size and to improve their stability, various experimental conditions were tested. Parameters like temperature, speed rate of the continuous and dispersed phase, length of the microchannel and the use of the surfactant Plurol in a concentration of 1 % to 3 % were investigated.

The results showed that the particles were well spherical and more uniform by choosing suitable values of speed rate. By influencing the temperature and the length of the outlet microchannel, the stability of particles was ameliorated minimizing the fusion of particles. Although the results are preliminary, this research proved that it is possible to prepare microparticles and encapsulate FITC-Si using microfluidic method.

The study was supported by student grant SVV 260 183 and Erasmus+ programme.

PHARMACEUTICAL CARE AND CONTINUAL PROFESSIONAL DEVELOPMENT IN GREECE

Karageorgiou E., Kolar J.

Department of Social and Clinical Pharmacy, Faculty of Pharmacy in Hradec Králové, Charles University in Prague, Czech Republic

e-mail: karageoe@faf.cuni.cz

The political line of the health systems in EU is patients oriented and demands increased rates of training and well understanding of pharmaceutical services and pharmaceutical care. Either in hospital pharmacies or in community pharmacies. Almost half of the annual pharmaceutical expenses accrued by the so called expensive drugs special category. Almost half of the annual turnover of community pharmacies is of the OTCs and the negative list of medicines. So examine the aspects of Continuing Professional Development (CPD) within deepened economic crisis in Greece in order to find professional solutions for the near future as well as by means of survival.

We deal with European surrounding and the present situation in basic education and continual training of community pharmacies in Greece taking into account the assumption that community pharmacies are part of the primary health care. We trace the real needs of well-trained community pharmacists to improve value for both the benefit of patients and the Health Care System.

It is the outcome of collaboration with the Institute for the Continual Training and CPD (IDEEAF) of PanHellenic Pharmaceutical Association which merely performs the unique thorough effort on the matter in Greece under the auspices and financing by pharmaceutical companies. The method of study includes a disseminated simple questionnaire to all those freely participating to IDEEAFs lessons.

The anonymous responds give a first impression and we can conclude in the following points.

a) The urgent dramatic changes – as main proposal – of the basic educational program within pharmacy faculties in Greece.
b) The direct collaboration of the PanHellenic Pharmaceutical Association (through IDEEAF) with international institutions specialized on social pharmacy.
c) The evaluation of pharmaceutical services by ETESTA the company of the PanHellenic Pharmaceutical Association for the research statistics and analysis of pharmaceuticals as basic pharmacoeconomic support.
d) The ongoing procedure of questionnaires in a second phase proposed by PGEU at a more centralized way.
e) The immediate establishment of an accreditation system certified by the PanHellenic Pharmaceutical Association.
f) A separate part of therapeutic categories of services for the emergency and /or the "heroic" drugs.

THE PERMEABILITY AND MICROSTRUCTURE OF MODEL STRATUM CORNEUM LIPID MEMBRANES CONTAINING NON-HYDROXYLATED AND (R)- AND (S)-α-HYDROXYLATED CERAMIDES

Šilarová M[1], Kováčik A[1], Opálka L[1], Pullmannová P[1], Zbytovská J[1,2], Vávrová K[1]

[1] Department of Inorganic and Organic Chemistry, Faculty of Pharmacy in Hradec Králové, Charles University in Prague, Czech Republic

[2] Institute of Chemical Technology, Prague, Czech Republic

e-mail: silarom@faf.cuni.cz

Ceramides (Cer) are essential components in the uppermost layer of the skin, called *stratum corneum* (SC). In the SC, Cer with cholesterol (Chol) and free fatty acids (FFA) are in equimolar ratio. Cer molecules are amphiphilic structures with a small polar head and two hydrophobic chains (Figure 1). Cer contain sphingoid bases, which are amino alcohols sphingosine (S), phytosphingosine (P), dihydrosphingosine (dS) or 6-hydroxysphingosine (H). These sphingoid bases are *N*-acylated by non-hydroxylated (N), α-hydroxylated (A) or ω-hydroxylated fatty acid, mostly by lignoceric (C24) acid.[1,2]

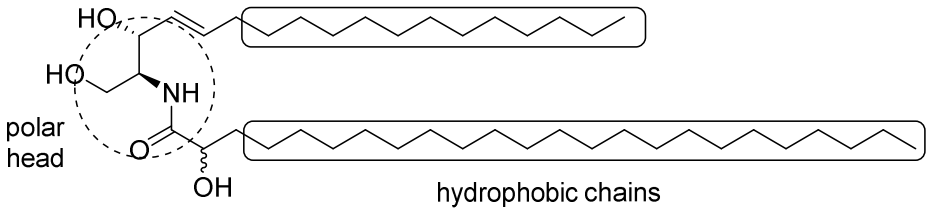


Figure 1. Structure of Cer AS: the dashed circle shows small polar head and the rectangles show hydrophobic chains.

The goal of this work was to study the permeability and microstructure of the model membranes containing non-hydroxylated Cer including the commercially unavailable Cer NH, and further to study the effects of additional α-hydroxyl group in Cer including their stereochemistry at Cer α-C. Therefore, we prepared model membranes containing Cer/FFA (C_{16-24})/Chol and small amount of CholS (5 %wt) where Cer were either non-hydroxylated (NS, NdS, NP, and NH) or α-hydroxylated Cer (2´*R*) and (2´*S*)-diastereomers (AS, AdS, and AP). We investigated four permeability markers: electrical impedance, water loss through the membrane and flux of the theophylline and indomethacin. The microstructure and miscibility of Cer with other lipids were analyzed by infrared spectroscopy and X-ray powder diffraction.

The results confirmed that every type of Cer has unique properties and every change in their structure (type of sphingoid base, α-hydroxylation and stereochemistry) leads to differences in barrier function of model lipid membranes.

The study was supported by Charles University in Prague (SVV: 260 183 and GAUK 1868214).

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1. Motta, S., Monti, M., Sesana, S., Caputo, R., Carelli, S., Ghidoni, R.: Ceramide composition of the psoriatic scale, Biochim. Biophys. Acta, 1182, 1993, 147-151.
2. Novotný, J., Hrabálek, A., Vávrová, K.: Synthesis and structure-activity relationships of skin ceramides, Curr. Med. Chem., 17, 2010, 2301-2324.

ETHICS IN PHARMACEUTICAL COMPANIES

Novakova, S.

Department of Social and Clinical Pharmacy, Faculty of Pharmacy in Hradec Králové, Charles University in Prague, Czech Republic

According to Study on Corruption in the Healthcare Sector one third of people think that taking of bribes and abuse of positions of power for personal gain are widespread among people working in the public health sector. The most serious situation is in the certification and procurement of medical equipment and in the autorisation and procurement of pharmaceuticals.[1] Problems of ethics are connected with pharmaceutical industry inherently. Therefore number of pharmaceutical companies try to enhance their reputation by various of ethical tools and activities. Nevertheless having the working business ethics program is very complex, difficult and neverending process. Ethics are part of all activities of business and if the ethics program is efficient it helps company increase its profit and meet its goals. Sophisticated ethics program includes ethical tools such as a code of ethics, an ethical audit, a corporate social responsibility, an education in ethics, an organisation structures, a stakeholder analysis, a whistleblowing and many more. The aim of this work is to describe these tools, a process of creating an ethics program and find out the advance of ethics program in pharmaceutical companies operating in the Czech Republic. For this purpose we used the questionnaire sent by post to the pharmaceutical companies.

According to the answers collected for our study, all of them consider ethics to be an important part of the business. Most of them think the level of business ethics in pharmacy has developed, even though a lot of these companies do not use full range of tools of business ethics.

The study was supported by the Charles University in Prague (Project SVV 260 187).

References:

1. EUROPEAN COMMISSION – DIRECTORATE-GENERAL HOME AFFAIRS. *Study on Corruption in the Healthcare Sector*. Luxembourg, 2013. ISBN 978-92-79-33864-9. Dostupné z: http://ec.europa.eu/dgs/home-affairs/what-is-new/news/news/docs/20131219_study_on_corruption_in_the_healthcare_sector_en.pdf

INFLUENCE OF EXCIPIENTS ON THE MECHANICAL PROPERTIES OF ORODISPERSIBLE TABLETS

Matoušková Z[1,2], Stasiak P.[2], Šklubalová Z[1]

[1] Department of Pharmaceutical Technology, Faculty of Pharmacy in Hradec Králové, Charles University in Prague, Czech Republic

[2] Zentiva,k.s., Czech Republic

e-mail: jungrovz@faf.cuni.cz

Orodispersible tablets are modern solution to the administration of drugs, mainly characterized by a short disintegration time and rapid onset of drug effect. Due to the required disintegration in the oral cavity, a necessary step in the formulation is also a choice of suitable sweeteners and flavours to influence palatability.

This work studies the mechanical properties of orodispersible tablets containing an active ingredient (VF) in confrontation with the used pre-compression/compression force and selected excipients. Tablets were produced by a direct compression method using two combinations of pre-compression/compression forces. The effect of the addition of hypromellose 5-10% (Methocel E5) and/or crospovidone 5-15% (Polyplazdone XL) on tablet friability, disintegration time and strength was studied.

Experimental results shown that mechanical strength and disintegration time of tablets are directly influenced with compression force, however, individual formulations were also influenced by the composition of the tablet. At the higher concentration of hypromellose decrease in the strength of tablets was detected while the disintegration time was prolonged. A similar effect on the tablet strength was observed when crospovidone was used. Extension of disintegration time was observed only for the combination of lower pre-compression/compression forces. At higher forces, however, relationship was not completely linear. The strength and disintegration time of tablets was significantly affected by the addition of sweeteners sucralose and/or sodium saccharin in both formulations investigated.

The results of this work allow to suggest a suitable formula for orodispersible tablets for administration of the active ingredient (VF) with the optimum strength and required disintegration time.

The study was supported by student grant SVV 260 183 and Zentiva, k.s.

THE ANALYSIS OF THE CARE OF PHARMACY CLIENTS WITH THE RISK OF ARTERIAL HYPERTENSION

Kotlanová L[1], Malý J[1]

[1] Department of Social and Clinical Pharmacy, Faculty of Pharmacy in Hradec Králové, Charles University in Prague, Czech Republic

email: kotlanol@faf.cuni.cz

Arterial hypertension (AH) is still very serious worldwide health problem. AH belongs among the most important risk factors for coronary heart disease, stroke, or peripheral arterial disease. Since, the detection and treatment of AH received considerable attention, in the clinical practice, satisfactory results have not been achieved yet. This problem can be improved by the involvement of pharmacists in the care of pharmacy clients as shown by published data. The aim of this work is to present the results of the analysis focused on the involvement of pharmacists in the care of pharmacy clients with the risk of AH.

Data were collected in one community pharmacy in the town with 3,500 inhabitants in Pilsen region from September 2014 to January 2015. Blood pressure measurement was included in each interview with the selected pharmacy client. The following data were recorded: socio-demographic characteristics; opinion on blood pressure measurement in a pharmacy; risk factors of AH or atherosclerosis; illness in anamnesis; using drugs including dietary supplements; the result of blood pressure measurement; interventions of pharmacist or identified drug-related problems. The measurement of blood pressure was carried out in accordance with valid current recommendations. The obtained data were evaluated using frequency analysis. Drug problems were classified according to the modified Pharmaceutical Care Network Europe classification V5.01.

Analysed data were obtained from 199 pharmacy clients (55.3% women; mean age 49.7 years). 30 clients, of which 12 clients were without diagnosed AH, had blood pressure above 140/90 mm Hg. Further, there were identified 43 drug-related problems related to

pharmacotherapy of AH. Each client received the recommendation to promote the adherence to healthy life style or pharmacotherapy. If necessary, the recommendations how to use medications were provided. Some clients were recommended to visit their general practitioners.

The blood pressure measurement as a part of counselling in a pharmacy can be regarded as the suitable method for identification of persons with undiagnosed AH. Particular attention should be given to smokers or persons with a higher BMI. More detailed knowledge of anamnesis can contribute to optimization of treatment plan, e. g. by the identification and solution of drug-related problems.

The study was supported by SVV 260 187.

PRESENCE OF DRUGS INTERACTIONS IN CZECH POPULATION

Průša P[1], Prokeš M[2], Suchopár J[2]

[1] Department of Social and Clinical Pharmacy, Faculty of Pharmacy in Hradec Králové, Charles University in Prague, Czech Republic

[2] Infopharm a.s., Prague, Czech Republic

e-mail: prusap@faf.cuni.cz

Interaction between drugs is an important problem of our nowadays´ society. The risk of new interaction between drugs is raised with every one added medication. It is not only a matter of the amount of drugs people use. The number of doctors that cure a person and write prescriptions for them is also very important factor in this case. In these cases when there are lot of doctors prescribing medications for a person we could avoid interactions between drugs by using a system where doctors curing one person know about each other and know who prescribes what kind of medication. There are a lot of studies interested in these problems abroad. Unfortunately there are very few studies taking care of this theme so far in our country. My work is aimed to describe prevalence of these interactions and their importance within the population of Czech Republic and point out the need to be aware of its danger to the public.

The study was supported by Association of Innovative Pharmaceutical Industries

ONLY ONE THIRD OF PATIENTS WITH COPD IS FULLY ADHERENT TO INHALATION THERAPY

Hruzdova H.[1], Touskova T.[1], Vytrisalova M.[1], Svancara J.[2] , Novotná B.[3] , Koblizek V.[3]

[1]Charles University in Prague, Faculty of Pharmacy in Hradec Kralove, Department of Social and Clinical Pharmacy

[2]Masaryk University, Faculty of Medicine, Institute of Biostatistics and Analyses, Brno

[3]Charles University in Prague, Faculty of Medicine in Hradec Kralove and University Hospital Hradec Kralove, Pulmonary Department¨

Patient adherence to treatment in chronic obstructive pulmonary disease (COPD) is essential to optimise disease management. Poor adherence is common and results in increased rates of morbidity, healthcare expenditures, hospitalisations and possibly mortality, as well as unnecessary escalation of therapy and reduced quality of life. The major problem is failure to adhere to inhaler technique. The aims of this project were to assess inhaler adherence for different types of devices and to analyze various aspects of adherence in a cohort of patients with severe COPD in the Czech Republic.

An observational multicentre study with the participation of 12 centres in the Czech Republic was conducted in cooperation with the Czech Multicentre Research Database of COPD (http://chopn.registry.cz). The inclusion critera are: severe COPD without fibrosis and FEV1<60%. The assessment was structured into five steps to be followed while using an inhaler. Adherence to each step was assessed in a dichotomous manner (performed properly/improperly). Each respondent was asked to report how often he/she rinses his/her mouth after using the corticosteroid inhaler (always: 75-100%, sometimes: 25-75%, never: 0-25%).

Three hundred and forty-three patients were enrolled in the study (mean age of 67 years). They used various types of inhalers, sometimes in combination. The most often used devices were pressurized metered-dose inhaler (pMDI) (N=171) and dry powder inhalers (DPIs) -

Handihaler (N=151), Aerolizer (N=146) and Diskus (N=68). The assessment of the adherence to inhalation technique revealed that less than 35% of the study cohort adhered properly to each of the five steps. Correct adherence to each inhaler was following: pMDI (31.9%), Handihaler (28.2%), Aerolizer (27.2%) and Diskus (12,7%). For all types of inhalers, the highest rate of failure to was observed for step 3 (failure to breathe out completely in one breath before taking the medicine with the next breath). After using a inhaler containing corticosteroid, 62% of respondents always rinse out their mouth 29% sometimes, and 9% never. Patients who fully adhere to inhaler use technique rinse out their mouth every time after inhalation of corticosteroids in 71% of cases while those who fail to use the inhaler properly only in 57% of cases (p =0,036).

Patients failed to adhere to inhaler technique more often while using aerosol inhalers. Powder inhalers are used improperly by more than half of the respondents. The most common error was complete exhalation before inhaling the drug. Patients who adhere to inhaler technique rinse out their mouth after inhalation of corticosteroids more often than those who failed to adhere to one or more steps.

The study was supported by project SVV 260 187. The COPD project is registered in ClinicalTrials.gov with the identifier NCT01923051