2016 № 1

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ОГЛЯДИ (REVIEWS)

Significant number of chronic bacterial infections involves the biofilm formation, but regulation of this process is still far from being well understood. Some progress has been achieved since the reassessment of extracellular DNA (eDNA) functions in biofilm establishment and remodeling, including influence of this natural polymeric substance on mechanical stability and adhesiveness of extracellular polymeric matrix (EPM). As was shown eDNA can appear in EPM at different stages of biofilm development via different ways, including active secretion or assimilation from surrounding milieu, but the main source is widely considered to be induced cell death with subsequent lysis. Cell death induction as a kind of social behavior in prokaryotes seems to represents an essential part of the developmental program, clearly associated with a switch to a sessile community lifestyle and biofilm formation per se. Review is focused on mechanisms allowing controlled eDNA release, mainly on those underlying self- or hetero-destructive behavior in bacterial populations.

Keywords: bacterial biofilms, extracellular DNA, review

«KING OF PROBIOTICS» *BACILLUS COAGULANS* IN MODERN COMBINED PROBIOTIC PREPARATIONS LAKTOVIT FORTE (FULL REVIEW)
Bomko T.V., Martynov A.V., Nosalska T.N., Kabluchko T.V.

Bacillus coagulans has an advantage over most other bacteria used as probiotics. It occupies an intermediate position between the genera *Bacillus*and *Lactobacillus*, is a spore-forming bacteria that produce lactic acid.This bacteria in the spores form can tolerate well technology processes, resistant to antibiotics and antiseptics, does not collapse under the influence of gastric juice and bile. Getting into the duodenum, the spores germinate into vegetative forms and begin vegetation and growth, providing probiotic effects.*Bacillus coagulans*refers to semi-residental bacteria - performing in the human probiotic function, it passes the sporulation phase and slowly leaves the body, standing out in the faeces in the spores form. Thus, it does not violate the personal composition of intestinal microflora.Probiotic *Bacillus coagulans* enhances the microbiological composition of the intestine, increasing the number of obligate microorganisms and displacing pathogenic flora. Mechanisms of this action based on the lactic acid production and some bacteriocins synthesis, also on the immunomodulatory effect - stimulation of cellular and humoral immunity. The bacterial cell wall and spores are the main immunomodulatory compounds of the *Bacillus coagulans*.Apparently, namely *Bacillus coagulans* immunomodulatory properties play a crucial role in the pharmacological effects. It is now well known about the important role of immune system in the pathogenesis of many diseases; it has the clinical effect without the need for intensive growth of bacteria and intestinal colonization; even small amounts of spores are sufficient for pharmacological effect; many experimental evidences of the spore penetration into the lymphatic system and interaction with immunocompetent cells, as well as local and systemic immune effects of probiotic.In addition to this main action, *Bacillus coagulans* helps to digest lactose, possesses anti-inflammatory and antioxidant activity, as well as the cholesterol-lowering effect.The effectiveness of probiotics, containing spores of *Bacillus coagulans*, was confirmed by evidence-based medicine. Probiotic effect in the treatment of various diarrheas, including those related to antibiotic treatment, enterocolitis and irritable bowel syndrome. *Bacillus coagulans* application reduces the duration of diarrhea, reduces the severity of abdominal pain, and normalizes the composition of intestinal microflora.*Bacillus coagulans* efficiency is identified also as hypocholesterolemic agents, as a means of anti-inflammatory effect in the combination therapy of arthritis, in combination with soya extracts for reducing menopause symptoms; by topical application it was effective in vaginitis, stomatitis and dental caries. In clinical studies proved the high safety of probiotics. Except spores *Bacillus coagulans*, as part of the “Laktovit Forte” there are also present B_9 and B_{12} vitamins in high doses, which are an essential component for the early spore’s vegetation in the large intestine. These vitamins stimulation phenomenon vegetation dispute has been confirmed experimentally, as shown in the clinic acceleration by 1-2 days of initial clinical manifestations of the effects of *Bacillus coagulans*, which is quite critical in acute diarrhea microbial origin, abdominal pain and cramps.

Keywords: *Bacillus coagulans*, pharmacology, biological properties, biological activity, bacteriocins, review

THE MOLECULAR EVOLUTION OF THE MOST DANGEROUS EMERGING VIRUS INFECTIONS
Popov N. N., Kolotova T. Yu.

In this paper we reviewed what is known about the emerging viruses, the hosts that they originate in, and the molecular events that drive their emergence. When a pathogen crosses over from animals to humans, or an existing human disease suddenly increases in incidence,

the infectious disease is said to be ‘emerging’. Most of the emerging pathogens originate from nonhuman animal species which has been termed natural reservoirs. The number of emerging infectious diseases has increased over the last few decades, driven by both anthropogenic and environmental factors such as population growth, urbanization, global travel and trade, intensification of livestock production. Now it has been believed that the emergence process may include four steps. On the first step the exposure of the humans to a novel virus occures**.** On the second step the subset of the viruses overcome the cross-species barrier. Host shifts have resulted in multiple human pandemics, such as HIV from chimps the H1N1, ‘‘spanish flu’’ from birds, SARS-CoV and virus Ebola from bats. Then some viruses enables to transmit from one human to another. And on the last step the viruses that are sufficiently transmissible between humans cause outbreaks and become endemic in human populations without the requirement of a natural reservoir. This review aims to discuss the molecular mechanisms that govern virus cross-species transmission and following stage, using the emergence of HIV, SARS-CoV, virus Ebola and influenza virus A as the models.Populations of many viruses harbour abundant genetic variability due to a combination of high mutation, recombination or reassortation rates and large population sizes. Mutations and recombinations has been associated with the increases in virulence, the evasion of host immunity and the evolution of resistance to antivirals. Genetic alterations in one species may results in the acquisition of variations that allow them to overcome cross species barriers and infect new hosts. Really, many recently emerged human diseases are caused by viruses that display active recombination or reassortment. The continual shuffling of genes of influenza A represents a example of the key role of reassortment for the new virus emergence. Available data demonstrate the possible origin of SARS-CoV from recombination of different bat SL-CoVs viruses strains. However in other cases the emergence of a specific virus cannot be directly attributed to its ability to recombine. For example, although SIV recombines at a high rate in natural reservoirs, there is no evidence that recombination assisted the cross-species transfer of the virus from the chimpanzee into humans. But mutagenesis and recombination actively shape the further molecular history of HIV in humans. Also it is not proved that recombination precede the cross-species jump of the Ebola virus. In summary, the available data suggest that although recombination, reassortment and mutagenesis is sometimes directly involved to the process of cross-species transmission, it is not a necessary precursor to successful viral emergence. Further investigations are required to reveal the role of genetic change in the history of virus emergence. We believe that comprehensive description of molecular evolution of new viruses has led to a better understanding of the causes and predictability of infection emergence.
Key words: emerging viruses, four stage of the emergence, natural reservoir, recombination, reassotment, mutagenesis, HIV-1, HIV-2, SIV, SARS-CoV, virus Ebola, influenza virus A

РОЛЬ ГЕРПЕСВІРУСІВ У ПАРАДИГМІ ІНФЕКЦІЙНИХ МІОКАРДИТІВ (огляд літератури) 48-55

Перемот С.Д., Смілянська М.В., Волянський А.Ю., Кашпур Н.В.

THE ROLE OF HERPESVIRUS IN THE PARADIGM OF INFECTIOUS MYOCARDITIS (REVIEW)

Peremot S., Smilyanska M., Volyanskiy A., Kashpur N.

According to the research of the last decade, there has been growth in the noncoronary disease infarction, increased their share among the causes temporary or persistent disability, disability and deaths. Among others myocarditis, which constitute 11% of all diseases of the cardiovascular system and is responsible for almost 20% of cases of sudden death in people physically safe. The disease is an inflammatory damage to cardiomyocytes, which is caused by direct action or indirectly through immune mechanisms of infectious agents of bacterial, viral, protozoan nature, as well as chemical and physical factors. The term "myocarditis" was first proposed I F Soberheim in 1837 and in 1900. A. Fiedler described the myocardial injury and justified the very concept of primary myocarditis. It is widely accepted that myocarditis - natural complications of infectious diseases in which etiological factor may be any infectious agent. However, at the present stage bacterial pathogens give way to viral. Those viruses according to numerous studies result in the development of myocarditis and consequently lead to the development of myocardial dysfunction. Until recently, most were considered cardiotropic ECHO viruses, Coxsackie group A, B, causing half of all cases of viral myocarditis. However recently reviewed the role of enteroviruses in favor of persistent virus and particularly the family Herpesviridae. The significance in the etiology of myocarditis herpes simplex virus, human herpes type 6, Epstein - Barr virus, cytomegalovirus. Published data indicate that the development of viral myocarditis patients after serous meningoencephalitis caused by the varicella-zoster virus. Widespread herpesvirus diseases their tropism for endothelial cells and myocardium, the capacity for long-term persistence in the body the opportunity to explain virus inducted inflammatory damage to cardiomyocytes. Increased attention to this issue recently linked with the present stage of the study of viral disease characterized by the accumulation of new scientific data obtained through the practice implemented highly informative diagnostic tests: ELISA, immunofluorescence reactions and molecular biological methods. However, despite scientific advances, today viral myocarditis remains less explored disease, myocarditis virus inducted since if they are not diagnosed in the acute phase of viral diseases remain without attention of clinicians in the future are difficult to identify. According to the literature in 24 - 33% of patients, myocarditis course may be clinically latent form and it is not accurate data to determine the absolute frequency of myocarditis. Endomyocardial biopsy (EMB) with immunohistochemical study of biopsy and polymerase chain reaction, which recognized gold standard for diagnosis of myocarditis, requires special equipment and highly qualified experts. In addition, still debate that the EMB diagnostic value and feasibility of its application in specific clinical situations and frequency of complications. When myocarditis may be no correlation changes on ECG, biochemical and clinical data, which significantly complicates diagnosis. Detect viruses in the myocardium can direct method of myocardial biopsy and PCR. This diagnostic importance only positive biopsy results, which in focal myocardial lesions likely to be negative. Animal studies have shown that determine viral replication in the myocardium is possible only in the first two weeks of the disease, when symptoms of myocarditis may not be available or they are minimal. It is shown that determination in serum pro-inflammatory cytokines in myocarditis has a high diagnostic value and could compete with invasive and instrumental methods of diagnosis, however, is not in the arsenal of research laboratories and practical carrying it requires funds. Bring viral myocarditis are also on the rise diagnostically meaningful titer virus neutralizing antibodies in the serum of the patient. However, antibody titer rises slowly, and often the results of this retrospective study have just mentioned. More important is the study of the immunological status of patients. Proof of inflammation in cardiomyocytes an imbalance of T-helper 1 and type 2, which defines the nature of the immune response in myocarditis. Thus, we can say that today there are a number of non-invasive methods of diagnosis of inflammatory lesions cardiomyocytes, which are highly informative. In addition, there is intense accumulation of new scientific data on the etiology and pathogenesis of viral myocarditis. So research aimed at finding clear diagnostic criteria for verification of myocarditis, and more widespread adoption of information and relatively safe methods of diagnosis in clinical practice is especially important and will enhance understanding of the significance of this disease in cardiovascular continuum.
Key words: infectious myocarditis, herpes, ELISA, PCR, Endomyocardial biopsy, immunofluorescence

ЕКСПЕРИМЕНТАЛЬНІ РОБОТИ
Experimental papers

ORGANIZATIONAL AND LEGAL STUDY OF THE CIRCULATION OF THE COMBINED MEDICINES CONTAINING DEXTROPROPOXYPHENE
Shapovalov V.V., Komar L.A.
Introduction. Scientific studies in recent years in the field of pharmaceutical law and forensic pharmacy indicate the existence of cause-effect relationships of various kinds of addictive dependence and illegal circulation of certain groups of combined medicines containing controlled active pharmaceutical ingredients. Illegal production of narcotic drugs and psychotropic substances from the combined drugs containing controlled active pharmaceutical ingredients is of particular concern because these medicines are in legal trade in the pharmaceutical sector of Ukraine and used by patients in the treatment of pain of various etiologies, with colds, dry cough and others. Purpose of the work is to carry out organizational and legal studies of the legal circulation of combined medicines containing controlled active pharmaceutical ingredient – dextropropoxyphene. **Materials and methods.** Research material were legal documents, instructions for medical use of combined medicines, forensic and pharmaceutical practice, scientific literature sources and Internet sites. In carrying out organizational and legal studies were used conventional regulatory, documentary, retrospective, forensic and pharmaceutical comparative graphical analysis methods. **Results and discussion.** In the course of the organizational and legal research on the characteristics of the legal handling controlled drugs that contain controlled active pharmaceutical ingredient - dekstropropoksyfen found that to date its circulation is regulated by the Order of the Ministry of healthcare of Ukraine from 19.07.2005. №360 «On approval of the rules of writing prescriptions and requirements, orders for drugs and medical products, the Procedure for sale of drugs and medical supplies from pharmacies and their structural subdivisions and Instruction on storage, accounting and disposal of prescription forms and claims-orders» According to the requirements of this order all combined dekstropropoksyfen-containing medicines should be discharged on a single prescription form F-1. To streamline the rules trafficking controlled drugs, which include controlled narcotic, have restrictions on their circulation stages of prescribing and dispensing, which is associated with quantitative content of psychoactive substances. Thus, for controlled medicines containing in its composition dekstropropoksyfen amount set for delivery in one recipe is not more than 0.6 grams of narcotic drug (p. 1.22.2 Order). In order to control the traffic of controlled medicines containing in its composition dekstropropoksyfen, regardless of its quantity and dosage form, all dekstropropoksyfen-containing medicines be subject-quantifiable in health care institutions that adopted Annex 3 of this order. **Conclusions.** During the organizational and legal studies analyzed the current pharmaceutical legislation-governing circulation of combined dextropropoxyphene-containing medicines. The particularities of the prescription of dextropropoxyphene-containing medicines were shown. On the example of the medicine of "Spazmoleks" showed the change in the regulatory framework of the combined circulation of the medicines and changing availability dextropropoxyphene-containing medicines for forensic and pharmaceutical criteria of "control mode". During the organizational and legal research conducted a retrospective analysis of prescription turnover dextropropoxyphene-containing medicines. According to the analysis revealed that these drugs are sold from pharmacies and structural units by the prescription F-1. Furthermore, according to existing pharmaceutical legislation it is possible to write and dispense recipe of the F-1 in combined dextropropoxyphene medicaments in an amount of more than 0.6 g in the case when packing products contains not more than 50 tablets. It was fixed that today dextropropoxyphene-containing medicines are subject-quantifiable. In the format of organizational and legal studies analyzed the circulation of the prescription forms of F-1 in health care.
Keywords: pharmaceutical law, forensic pharmacy, circulation, combined medicines, controlled active pharmaceutical ingredients, dextropropoxyphene.

Introduction. The article is devoted to the development of techniques for quantitative analysis of lime flower in order to make amendments to existing pharmacopoeian monographs for this herbal drug. Lime inflorescences contain lipophilic biologically active substances (BAS) causing notable antimicrobial and anti-inflammatory effects and also more polar phenolic compounds with antiulcer activity. Considering this, it's necessary to regulate all these groups of BAS quantitatively. **Materials and methods.** For this study six batches of lime flowers harvested in 2008-2009 yrs. in Kharkiv, Rivno and Zhitomir regions were used as crude herbal drug. Loss on drying was determined by routine pharmacopoeian procedures. Total content of lipophilic substances was determined gravimetrically after Soxhlet extraction of samples 1, 5, 7 and 10 g in weight with methylene chloride, considering that by its extracting ability this solvent is close to liquefied difluorochloromethane (freon R22) used by us for obtaining of lipophilic complexes. The duration of complete analytical extraction was determined by infusion of six 10 g assays of lime flowers during 1, 2, 3, 4, 5, 6 hours, then quantity of lipophilic extractives was revealed gravimetrically. Quantity of essential oil in lime flowers was evaluated under the procedure of EP7, 2.8.12. Weight of the herbal drug sample was 200 g, distillation rate – 2,5- 3,5 ml/min, volume of distillation liquid (water) – 500 ml, volume of xylene in the graduated tube – 0,50 ml. Total flavonoid content recalculated to quercetin was determined after hydrolysis with acidified acetone, withdrawing of flavonoid aglycones with ethylacetate and by further spectrophotometry of their complexes with aluminium chloride. All quantitative determinations were replicated five times for each assay. All chemicals and reagents were of analytical grade. **Results and discussion.** It was found that adequate accuracy of the analysis of lipophilic extractives taken with methylene chloride was achieved if assay weight is not less than 7 g: relative error was less than 2 %. Study of extraction kinetics showed that after 4 hours lipophilic substances soluble in methylene chloride were taken almost completely. Analyzing 6 batches of lime flowers from different Ukrainian regions, it was found that yield of total extractives taken with methylene chloride did fall within insignificant limits – 1,86-2,26 %, that testifies onto rather stable accumulation of these biologically active substances in lime flowers even despite different climatic conditions. Essential oil content varied in rather wide limits – 0,34-0,55 ml/kg of herbal drug and considerably depended on harvest place: in the batches from Northwest of Ukraine this value was less than in the Eastern ones. Year of harvesting had less influence on quantity of essential oil in lime flowers. The relative error of the quantitative determinations was within 4–8 %. Total flavonoid content in the analyzed batches of lime flowers was considerably variable (from 0,30 to 0,52 %) and depended mainly on place of harvesting, and this crude herbal drug from the north-west of Ukraine (Rivno region) showed the highest results among the analyzed samples. Besides, if consider the lower limit regulated by the monograph of Belarusian Pharmacopoeia, p. 370, then only one batch conformed to the norm (not less than 0,5 %). Therefore it's recommended to fix the lower limit 0,3 % for content of

total flavonoids in the corresponding monograph draft or analytical normative documentation. The relative error of the quantitative determinations of flavonoids was within 1,5–3,1 %. **Conclusion.** Six batches of lime flowers harvested in various regions of Ukraine in 2008 and 2009 yrs. were investigated. Based on the results obtained it is offered to regulate the following quantity parameters in the amended monograph draft for lime flower: total extractives taken with methylene chloride – not less than 1,8 %, essential oil content – not less than 0,3 ml/kg, total flavonoid content recalculated as quercetin - not less than 0,3 %.
Keywords: Lime Flowers (Tilia cordata Mill.), Quantitative Analysis, Essential Oil, Flavonoids, Difluorochloromethane.

ВИЗУАЛИЗАЦИЯ БИОХИМИЧЕСКОЙ АКТИВНОСТИ МИКРООРГАНИЗМОВ РОДА AEROCOCCUS ВИДА AEROCOCCUS VIRIDANS 67-72

Кременчуцкий Г.Н., Степанский Д. А., Кошевая И.П., Турлюн С.А.

VISUALIZATION OF BIOCHEMICAL ACTIVITY OF MICROORGANISMS GENUS AEROCOCCUS SPECIES AEROCOCCUS VIRIDANS

Kremenchutsky G.N., Stepansky D.O., Koshevaya I.P., Turlun S.A.

Introduction. *Aerococci* are catalase-negative Gram-positive microorganisms, widespread in the environment, in the cold-blooded microbiocenoses [1, 2] and warm-blooded organisms [3]. Currently, there are seven species of the *Aerococcus* genus [4]. Type *A. viridans* got its name as a result of greening blood agar around the growing colonies. It was found that one of the products of *A. viridans* growth is hydrogen peroxide, has an antagonistic effect on various kinds of bacteria "in vitro" and "in vivo" [5]. It was subsequently found that hydrogen peroxide and superoxide radical are produced as a result of NAD-independent lactatoxidase [6,7] and piruvatoxidase functioning[8]. The oxidative ability of *A. viridans* is a distinctive feature and allows to visualize these properties using a specific indicator medium [9]. We have developed an indicator that enables to visualize oxidation and reduction properties of aerococci. **Material & methods.** Auto-symbiotic cultures of *A. viridans* was used for studying of oxidase - reductase activity, inoculated from human body, an industrial strain of *A. viridans 167*, used for the preparation of "A-bacterin", culture of *Aureobasidium pullulans B5*, isolated from the soil and having glucose oxidase activity [10]. Designed indicating medium were also tested in the inoculation of aerococci crops, having lactatoxidase activity of biomaterials from birds and mammals. As a basis for the indicating media (IM) IM1 media was selected with following composition (g per 1 liter of water) Iodide / potassium 26.0 Soluble starch 10.0 Nutrient agar 30.0 For visualization of oxidase-reductase activity of aerococci acellular components IM4 was developed based on IM3, in which distilled water after double purification was used instead of tap water and highly purified agar-agar was used instead of standard nutrient agar. **Results & discussion**. IM1 is used to test the oxidative properties of aerococci crops. IM manifests the appearance of a dark purple color, after processing the surface of cups with 10% sulfuric acid. Dark purple areas with lactatoxidase activity in the growth zone of the culture are clearly visible. IM2 with high content of KJ can be used for isolation of aerococci colonies from contaminated biological material. IM3 with sodium selenite at a concentration of 1 g / l was used to visualize the reductase activity of microorganisms. Selenium recovered with the advent of the red color in the areas of crop growth and the colonies while growth of aerococcuses. Nutrient indicator medium IM3, containing an increased concentration of KJ, can be used for isolation and studying the oxidizing ability of different microorganisms which produce hydrogen peroxide in the oxidation of biological substrates. IM4 allows us to study the biochemical activity of the enzyme complex (EC) obtained by ultrasound (US) from washed thoroughly biomass of aerococcuses [11] and biological substrates. **Conclusion.** 1. Indicator nutrient mediums IM1, IM2, containing the KJ and soluble starch allows to visualize the oxidizing power of aerococci and isolate them together with another microorganisms from contaminated biological products (water, air, soil, biological fluids). 2. The indicator nutrient media IM3 allows (simultaneously with oxidase activity of microorganism) to visualize reductase activity in the reduction of selenium with classification on biological types. 3. Minimal (hungry) IM4 allows us to observe the interaction between aerococci enzyme complex and substrates of oxidation and reduction, with further extrapolation of the results to the role of aerococci in microbiotope of host organism. The proposed indicator media can be used for microbiological and genetic studies, microbiological determination of amino acids, vitamins and nitrogenous bases.
Key words: aerococcus viridans, selective mediums, cultivation, stain.

ОСОБЛИВОСТІ ПЕРЕБІГУ ЕПІДЕМІЧНОГО ПРОЦЕСУ ВІЛ-ІНФЕКЦІЇ У ХАРКІВСЬКІЙ ОБЛАСТІ 73-79

Ніколаєва Л.Г., Майстат Т.В., Подаваленко А.П., Кущ Д.В.

COURSE FEATURES EPIDEMIC PROCESS HIV INFECTION IN KHARKIV REGION

Nikolaeva L.G., Majstat T.V., Podavalenko A.P., Kusch D.V.

Introduction. In the context of the transformation of the spheres of human living epidemic HIV-infection continues. According to the intensity of the epidemic process of HIV-infection, Ukraine takes one of the first places among the European countries. The epidemic process of the infection is concentrated mainly on the high-risk groups, and there is uneven prevalence. Besides in most cases this distribution can not be explained by the social and economic characteristics of certain territories. Kharkiv region belongs to the territory of Ukraine with the lowest prevalence level of HIV-infection. Though in terms of the social and economic crisis due to hostilities in the east of the country, which the region borders, the epidemic situation may significantly become worse. Work objective: to study the peculiarities of the course of the epidemic process of HIV-infection for the period from 1987 till 2015 in Kharkiv region that will improve the epidemiological surveillance of the infection and develop appropriate preventive measures in modern conditions. **Material & methods.** The studies were conducted in Kharkiv region, which is a big industrial and administrative center. The city of Kharkiv is located at the crossroads of drug trafficking from Asia and Russia. The reportings and analytics of the Kharkiv regional center for prevention and control of AIDS and the Ministry of Health of Ukraine for the period of 1987 – 2015 were used in the research. The analysis of incidence of HIV prevalence, structure of transmission routes and sex-age groups were carried out using descriptive and evaluative and analytical ways of epidemiological research method. **Results & discussion.** During 1987 – 2015 in Kharkiv region there were officially registered 7868 cases of HIV-infection what was equal to 4.0 % of the registered cases in Ukraine. Since 1996 a marked upward tendency of the incidence of HIV infection in Kharkiv region (growth rate – +7.0 %), and on the whole in Ukraine (growth rate – +14.0 %). Herewith of incidence of HIV-infection in the region were lower than on the whole in Ukraine (accordingly 2.4 – 23.7 and 10.6 – 47.1 per 100 000 population). Almost all of the administrative territories of Kharkiv region have been involved into the epidemic process of HIV-infection, but in districts of the region the incidence of HIV-infection, AIDS and mortality were in 1.4 – 2.7 times higher than in Kharkiv itself. The measures directed at the prevention of HIV-infection in the groups of risk were actively being taken during the supervision in the region. Due to the collaboration of the executive authorities and local government, departmental structures, medical community and public organizations directed at the suspension of HIV-infection/AIDS epidemic in the region we managed to stabilize a little an epidemical situation on HIV-infection. For the period of 1987 – 2015 in the region there was defined the increase in the number of the infected women (from 12.9 % to 41.0 %) and the decrease of the number of men (from 87.1 % to 59.0 %) what led to the change of the ratio of the number of women with the number of men in accordance with 1:7 (1996) and 1:1.5 (2015). There were

adult patients with HIV-infection (79.5 – 84.9 %) in 4 - 5 times more than children under the age of 14 (15.1 – 20.5 %). The largest proportion of HIV-infected people in the age group of 25 – 49 years (60.0 – 72.2 %) and the lowest – 15 – 17 years (0.1 – 1.0 %). In different periods of the current epidemic process of HIV-infection the ratio of parenteral, sexual and vertical routes of transmission considerably changed. At the beginning of the epidemic the incidence level of HIV-infection has been significantly affected by the drugs spreading and an increase in vulnerable groups of injecting drug users. Thus, in 1996 the part of the sexual route of transmission was equal to 5.7 % cases, whereas the part of parenteral one consists of 77.1 % cases. Taking effective preventive measures against drug abuse has led to the decrease in the incidence of HIV-infection among this group of risk and changes of transmission routes. In 2015 in the structure of the leading transmission routes there were (22.6 ± 1.8) % of parenteral and (56.9 ± 2.1) % of sexual cases ($p<0.05$). These data indicate that the implementation tract infection due to injecting drug use leads to a concentrated stage of the HIV epidemic. At the same time the increase in the proportion of sexual transmission increase in the number of infected women indicate a threat to the output of the epidemic risk groups to the general set of the population.

Conclusions. 1. The incidence of HIV-infection in the region was in several times lower than on the whole in Ukraine (accordingly 2.4 - 23.7 and 10.6 - 47.1 per 100 000 population). 2. Carried out research in the region revealed the peculiarities of the epidemic process of HIV-infection. So the level of growth of newly registered cases of HIV-infection from 0.1 per 100 000 population in 1995 to 20.5 per 100 000 population in 2015 was set (the growth rate was +7.0 %); a gradual change in the sexual spectrum of HIV-infected people (women from 12.9 % to 41.0 % and men from 87.1 % to 59.0 %) and the structure of the leading transmission routes (parenteral from 77.1 % to 22.6% and sexual from 5.7 % to 59.6 %); involvement in the epidemic process of all age groups with a predominance of the most working-age population 25 – 49 years. 3. The HIV epidemic is concentrated on the most vulnerable groups of population, but there is a risk of generalized spreading of HIV among the population. 4. Epidemiological surveillance of HIV infection must be adapted to the local epidemiological conditions, and preventive measures aimed at the timely detection of infection cases and the suspension of the epidemic.

Keywords: human immunodeficiency virus (HIV), incidence, social groups of observation, transmission route