THE FATTY ACIDS IN BLOOD PLASMA AND ERYTHROCYTES IN TEST OF GLUCOSE TOLERANCE

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The sample of 26 patients with ischemic heart disease and syndrome of insulin resistance was subjected to standard test of glucose tolerance. The content of individual fatty acids was detected using technique of gas chromatography and mass spectrometry. In blood plasma, after 2 hours of post-prandial hyperglycemia, reliably decreased content of C 16:1 of palmitoleic mono fatty acid, C 18:1 oleic mono fatty acid and in a lesser degree C 18:2 of linoleic unsaturated fatty acid (p≤0.05). The level C 14:0 of myristic unsaturated fatty acid, C 16:0 of palmitic unsaturated fatty acid and with 18:0 of stearic unsaturated fatty acid, ratio C 16:0/C 16:1 and C 18:0/C 18:1 had no changes: content of both ω-6 C 20:3 digomo-γ-linoleic unsaturated fatty acid and essential polyenoic fatty acids remained the same. The significant differences between initial content in blood plasma of palmitic saturated fatty acid and oleic monoenic fatty acid was noted. The alteration in content of fatty acids in membranes of erythrocytes is the most expressed. In erythrocytes reliable (p≤0.05) decrease of content of C 16:0 palmitic fatty acid, C 18:0 stearic fatty acid and C 18:1 oleic fatty acid is established. The reliable decrease is noted in content of linoleic unsaturated fatty acid. In erythrocytes, moderate decrease is detected in levels of C 20:4 of arachidonic polyenoic fatty acid, C 20:5 of eicosapentaenoic polyenoic fatty acid. It is assumed that under post-prandial hyperglycemia insulin regulates metabolism of fatty acids, blocks lipolysis, decreases in cytosol of cells content of oleic and palmitic fatty acids in form of acetyl-KoA and forces mitochondrions intensively oxidate acetyl-KoA formed from pyruvate, from GLU. On surface of membrane, insulin increases numbers of glucose carriers GLUT4. Hypoglycemic effect of insulin is mediated by regulation first of all of metabolism of fatty acids. Hyperglycemia and insulin are two phylogenetically different humoral regulators. Insulin initiates blockade of lipolysis in adipocytes and positioning on membrane GLUT4. Hyperglycemia passively (activated) increases absorption by cells GLU on gradient of concentration inter-cellular medium cytosol and synthesis of glycogen.

Keywords: insulin, fatty acid, test, tolerance to glucose, resistance to insulin

THE ATOMIC EMISSION ANALYSIS UNDER EXAMINATION OF COMPOSITION OF GALLSTONES

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The high morbidity of cholelithiasis and considerable percentage of complications dictates necessity to search new little invasive modes of treatment. In this, one of the perspective directions is the application of dissolution of concrements using contact litholysis. The solubility of concrements directly depends on their composition. The detailed knowledge of composition of gallstones subjected to dissolution is needed for prognosis of solubility of concrements and experimental findings of new solvents. The mode of atomic emission analysis was applied to study mineral composition of 105 gallstones extracted from gallbladders of patients with cholelithiasis operated using laparoscopy. The experimental studies were implemented in vitro on dissolution of concrements depending on their composition and using octane acid. It is established that solubility of gallstones depends on content of calcium and ash composition of concrements. In consideration of relative simplicity of application, absence of complicated preparation of tests for analysis, distinct dependence of solubility of concrements on content of calcium and ash content of gallstones the atomic emission analysis can be recommended for examination of composition of gall concrements in case of search and development of new modes of litholysis. This mode of analysis can be also applied for prognosis of dissolution of concrements under application of contact litholysis.

Keywords: cholelithiasis, gallstones, atomic emission analysis, litholysis

THE ANNEXIN 5 IN SERUMS OF PREGNANT WOMEN AND PATIENTS WITH PARTICULAR TYPES OF CANCER

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The detection of biomarkers to be applied to reveal different types of tumors is an actual demand of today. Since course of this disease can be asymptomatic these kinds of markers can be applied in widely-distributed screening procedures. Many types of biomarkers for detection of cancer exist. However, all these markers are specific only for particular type of tumor and have no use in screening procedures for detection of this pathology. The Annexin 5, a Ca-depended phospholipid binding protein, was discovered in serums of all pregnant women on various stages of pregnancy. The study was implemented using method of latex agglutination. More than that, this protein was detected in serums of patients with several types of cancer. The possibility to apply annexin 5 as marker for screening of various types of cancer is considered.

Keywords: annexin 5; latex agglutination; diagnosis of cancer.

THE CHARACTERISTICS OF REGULATION OF BONE REMODELING UNDER INHERENT PATHOLOGY OF LOCOMOTIVE SYSTEM IN CHILDREN
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The article presents the results of evaluation of clinical pathogenic value of hormones, markers of metabolism and indicators of mineral metabolism in formation of inherent pathology of locomotive system in children. The sampling included 29 children with dysplasia and deformation of lower extremities and 35 children without pathology of locomotive system. All children aged from 6 to 12 years. The serum levels of parathormone, calcitonin and 25(OH)-D3 were established using analytic module platform «Cobas 6000 SWA» (Roche Diagnostics, Switzerland). The content of somatotropic hormone in blood serum was evaluated using analyzer «Immulite One» (USA). The single examination of serum concentrations of total and ionized calcium, phosphorus, magnesium and activity of alkaline phosphatase was implemented using automatic analyzer «Cobas 6000 SWA» (Roche Diagnostics, Switzerland) and «HITACHI-912» (Roche Diagnostics corporation, Indianapolis, IN, USA). The activity of process of formation of and resorption of bone tissue was evaluated according content of P1NP (N-terminal propeptid of type I collagen), osteocalcin and β-CrossLaps (β-isomerized carboxy-terminal cross-linking region of collagen type I) in blood serum. The module platform «Cobas 6000 SWA» (Roche Diagnostics, Switzerland) was used. The analysis of correlation interrelationships between qualitative indicators of bone metabolism and levels of regulative hormones in children with inherent pathology of locomotive system made it possible to clarify possible aspects of pathogenesis of disorders of bone remodeling as a result of induction of synthesis of somatotropic hormone and parathormone. The complex multi directional impact of these hormones results in uncoupling of synthesis processes and bone tissue resorption against the background of total slowing-down of bone remodeling. These occurrences apparently promote formation of dysplasia and deformation of bone skeleton.

Keywords: parathormone; somatotropic hormone; remodeling; bone tissue.

THE MODIFICATION OF METHOD OF ERYTHROGRAMS IN PATIENTS UNDER CHRONIC HEMODYALYSIS USING HARDWARE-CONTROLLED ADMINISTRATION OF LASER LOW-ANGLE LIGHT SCATTERING
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The detailed analysis of structural characteristics of erythrocytes can be implemented with method of erythrograms. However, its practical application in conditions of medical laboratory is a long and labor-intensive process of little avail for expressdiagnostic. To register alterations of morphologic functional characteristics of erythrocytes in patients under chronic dialysis as compared with patients without renal pathology the new technique of low-angle light scattering never applied before for this purpose. Therefore, the purpose of this study is to resolve issue concerning validity of application of this technique for registration of alterations of functional status of erythrocytes in patients of department of chronic dialysis as compared with patients without renal pathology. The experiments concerning the identification of resistance of erythrocytes established significant differences for acid and ammonium models of lysis between patients without renal pathology and patients under chronic dialysis as compared with patients in the course of dialysis session. In case of ammonium lysis, the differences were statistically significant between patients without renal pathology and patients under chronic hemodialysis. In case of acid model, the differences were statistically significant in patients in course of dialysis session. Therefore, the application of low-angle light scattering technique is valid and informative for evaluation of functional status of erythrocytes in patients with terminal stage of chronic renal disease receiving treatment of regular hemodialysis. The technique itself is low-cost, simple in application and easily reproduced. Therefore, the technique of low-angle light scattering...
can be applied both in research studies and clinical practice to identify characteristics of stability of membrane systems.

Keywords: erythrogram, lysis, erythrocyte, ammonium medium, lysis, acid medium, technique of low-angle light scattering

KL-1404-027
INSULIN: INITIATION OF POOL OF INSULIN-DEPENDENT CELLS, TARGETED TRANSFER OF TRIGLYCERIDES AND INCREASE OF KINETIC PARAMETERS OF OXIDATION OF FATTY ACIDS
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The insulin, to provide with energy the biological function of locomotion, formed: a) pool of phylogenetically late insulin-dependent cells; b) highly productive vector variant of transfer of saturated and mono unsaturated fatty acids only to insulin-dependent cells; c) new variant of active absorption of substrates for acquiring energy by cells apoE/B-100-receptor endocytosis; d) transformation of all endogenically synthesized palmitic saturated fatty acid in oleic mono saturated fatty acid and e) replacement of potentially ineffective palmitic variant of formation of energy in vivo with potentially high-performance oleic variant of metabolism of substrates for turning out of ATP. The insulin expressed synthesis of apoE glucose carrier 4 and stearyl-KoAdesaturase. These occurrences confirm that syndrome of insulin resistance primarily is the pathology of metabolism of fatty acids and only secondary the pathology metabolism of glucose. The multi-functional fatty cells of visceral areolar tissue and specialized adipocytes of subcutaneous fat depots are phylogenetically, regulatory and functionally different cells. They are formed under development of different biological functions: the first ones under realization of biological function of trophology and second ones under realization of biological function of locomotion. At the level of organism, the mechanisms of hypothalamus-fatty cells feedback are realized by peptide leptin and in case of hypothalamus-adipocytes feedback peptide adiponectin. The potential possibilities of mitochondria in synthesis of ATP are high and are conditioned only by amount of substrate of mitochondria acetylKoA. This shortage can be chronic as in cases of disorder of insulin function and palmitic variant of metabolism of substrates for acquiring energy by cells. The deficiency of acetyl-KoA can be acute as is the case of diabetic coma when surplus amount of ketonic bodies follows the expressed deficiency of acetyl-KoA formed from glucose and fatty acids. Can the intravenous injection of acetyl-KoA be effective under diabetic ketoacidotic coma?

keywords: insulin, fatty acids, adipocytes, mitochondria, peroxisomes

KL-1404-040
ABOUT POSSIBLE ADDITIONS TO ACTUAL SCHEME OF NORMAL BLOOD FORMATION ON THE BASIS OF STUDY OF LEUKEMIC BLAST CELLS
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The issue of introduction of number of additions into actual scheme of blood formation is discussed. The long standing experience of laboratory diagnostic of oncologic hematological diseases in adults and children and the analysis of published data about normal blood formation are involved into consideration. The existence is surmised of common oligo-linear precursors for B-lymphocytes and monocytes, natural killer cells and monocytes and common cell-precursor of T-lymphocytes and dendrite cells as well. At the same time, the issue concerning the existence of human common cell-precursor of lymphization capable of differentiating into Band T-lymphocytes and natural killer cells is disputable.

Keywords: scheme of blood formation, polypotent hematopoietic stem cells, multi-potent and oligo-linear cells-precursors, leukemic stem cells

KL-1404-044
THE COMPARATIVE CHARACTERISTIC OF METHODS OF LABORATORY DIAGNOSTIC OF OPISTHORCHIASIS
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The analysis of samples of blood serums and copromaterial from patients was carried out to evaluate effectiveness of diagnostic of opisthorchiasis invasion. The Kato-Miura technique of thick film under cellophane layer and sedimentation technique of acetic etheric precipitation were applied for parasitologic diagnostic. The technique of immunoenzymometric analysis was applied for serological diagnostic. The analysis of detection rate of eggs of opistorchis in copromaterial and level of anti-opistorchis antibodies in samples of blood serum of patients demonstrated the presence of strong direct correlation relationship between these indicators. It is demonstrated that for laboratory diagnostic of opisthorchiasis it is impossible to limit oneself to some single technique. It is established that on the territories with middle and low level of population infection rate of opistorchis it is appropriate to apply complex of methods including analysis of
blood serum for presence of specific immunoglobulins to antigens of opistorchis and twice or thrice analysis of feces with copro-ovoscopic methods.

Keywords: opisthorchiasis, copro-ovoscopy, laboratory diagnostic of opisthorchiasis

**KL-1404-046**

**THE VALIDATION OF KIT OF REAGENTS FOR QUANTITATIVE DETECTION OF DNA OF HUMAN CYTOMEGALOVIRUS IN BIOLOGICAL MATERIAL USING POLYMERASE CHAIN REACTION TECHNIQUE IN REAL TIME OPERATION MODE**


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The validation of kit of reagents destined to detection and quantitative evaluation of DNA of human cytomegalovirus in biological material using polymerase chain reaction technique in real time operation mode was implemented. The comparison was made against international WHO standard The first WHO international standard for human cytomegalovirus to implement measures the kit of reagents “AmpliSens CMV-screen/monitor-FL” and standard sample of enterprise DNA HCMV (The central research institute of epidemiology of Rospotrebna zdor) was applied. The fivefold dilution of international WHO standard and standard sample of enterprise were carried out in concentrations of DNA HCMV from 106 to 102. The arrangement of polymerase chain reaction and analysis of results were implemented using programed amplifier with system of detection of fluorescent signal in real-time mode “Rotor-Gene Q” (“Qiagen”, Germany). In the total of three series of experiments, all stages of polymerase chain reaction study included, the coefficient of translation of quantitative evaluation of DNA HCMV from copy/ml to ME/ml equal to 0.6 was introduced for this kit of reagents.

Keywords: validation, quantitative evaluation, DNA, cytomegalovirus hominis, human cytomegalovirus, international WHO standard, polymerase chain reaction, real-time mode

**KL-1404-056**

**OPTIMIZATION OF HEALTHCARE EXPENDITURES, CENTRALIZATION OF LABORATORY DETERMINATIONS AND LABORATORY INFORMATION ACCESSIBILITY**

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The optimization of money expenditure for healthcare is leading to the reorganization of the structure of medical organizations, to reducing of small establishments, to centralization of laboratory analyses with cessation of their performing in some hospitals and out patient offices.

This tendency is based on medical (enlargement of laboratory tests spectrum) and economical (high productivity, relative reducing of net cost of laboratory determinations) reasons. But the repercussions of switch-over to centralization of laboratory analyses performance must be evaluated from the position of laboratory information accessibility tacking in account the need in express analyses for patient, situated on territories outlying from the centralized laboratory. Using of the portative analytical devices and therefore the possibility to perform the urgent analyses by non-laboratory personal in point of care and by patients themselves as a matter of self-testing can help to solve the problem of accessibility of laboratory tests in conditions of laboratory centralization in some regions.

Key words: optimization of money expenditure for healthcare, centralization of laboratory analyses, limitation of laboratory information accessibility, using of the portative analytical devices, point of care testing

**KL-1404-060**

**THE CIRCULATING TUMOR CELLS: LIQUID BIOPSY OF CANCER**

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Recently, promising techniques of detection of circulating tumor cells have been developed. The analytical specificity and clinical practicality of these techniques are to be demonstrated in broad prospective multicentric studies to achieve high level of validity needed for its implementation into clinical practice.