FUNCTIONAL ACTIVITY OF PERIPHERAL BLOOD NK-CELLS AT PREECLAMPSIA

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Abstract: During healthy pregnancy NK-cells migrate to decidual tissue where their cytotoxic activity decreases. Preeclampsia is associated with increasing amount of NK-cells in decidual tissue and in peripheral blood. The data on NK-cells' functional activity at preeclampsia are controversial. The aim of the study was to assess functional activity of peripheral blood NK-cells at preeclampsia. We observed that NK-cells changed the strategy of their functional activity: TRAIL-connected induction of apoptosis dominated while cytotoxicity associated with lytic granules release decreased. This work was supported by grants НШ-3594.2010.7, ГК №02.740.11.0711, МД-150.2011.7.

Key words: NK-cells; functional activity; CD107a; TRAIL; preeclampsia

MORPHOLOGICAL AND FUNCTIONAL ALTERATIONS IN IMMUNE SYSTEM OF OFFSPRING OF MURINE DAMS EXPOSED TO STIMULATION OF THE IMMUNE SYSTEM IN EARLY PREGNANCY INDUCED BY SYSTEMIC INFLAMMATORY RESPONSE

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Abstract: The relationship between prenatal influence on the organs of the immune system of the fetus and their functioning in the postnatal period insufficiently studied. Objective: to study the structural-functional changes of organs of the immune system in the development of the systemic inflammatory response in the offspring of female mice of C57BL/6 undergoing impact on the immune system in the early stages of pregnancy until the beginning of the formation of the organs of the immune system of the fetus. Found that prenatal exposure leads to changes in the response of the thymus and spleen on the introduction LD50 of lipopolysaccharide of E. coli and less pronounced systemic inflammatory response that causes the survival of animals. Акцидентальная involution of the thymus offspring has been slower. Morphofunctional changes of the spleen are less pronounced, which is associated with slowing the development of the spleen as organ of the immune system. The peculiarity of the functioning of the spleen is a violation of cooperation of cells in the marginal zone, which lacked the migration of neutrophils.

Key words: thymus; spleen; prenatal exposure; concanavalin A; a systemic inflammatory response; pregnancy

CIRCULATING IMMUNE COMPLEXES INCLUDING CALC-1 GENE PRODUCTS IN THE CHILDREN WITH BACTERIAL INFLAMATION OF DIFFERENT SEVERITY

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Abstract: Procalcitonin is a polypeptide product of CALC-1 gene consisting of 116 amino acids. After enzyme processing of this peptide hormone calcitonin, N-terminal peptide and C-terminal peptide CCP-1 are produced. Circulating immune complexes containing procalcitonin and other peptide calcitonin precursors were detected in the serum of children with bacterial infections of different severity. The highest titers of complexes including IgG and procalcitonin and/or N-terminal peptide were detected in patients with sepses and severe bacterial infection. This kind of circulating immune complexes were registered in 80 % of children of this group. The study of the serum of healthy children also showed the presence of complexes of auto-
antibodies with low-molecular weight peptide calcitonin precursors. The important of circulating immune complexes for sepsis prediction and its role for infection pathogenesis are discussed.

**Key words:** procalcitonin; circulating immune complexes; bacterial infection

**IM-1401-017**

MODULATION OF CELLULAR GENE TRANSCRIPTION BY DRUG "IMMUNOMAX": ACTIVATION OF INTERFERON AND INTERLEUKINE GENES

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Abstract: The well-known medical drug "Immunomax" produced by Russian firm "ImmaPharma" from plant material was studied. According to the results "Immunomax" regulates activity of many cellular genes. In human fibroblasts this drug induced transcription of multifunctional factors NF-κB and p53, it increased considerably expression levels of beta1-interferon and interferon-stimulated gene (ISG 15) and stimulates immune cytokine genes such as IL1b, IL4, IL6, IL8 and IL17A. The "housekeeping genes" (18S ribosomal RNA, GAPDH, actin-beta, B2M) were also activated. For the first time we studied "Immunomax" action on gene expression of subtypes (1, 2, 5, 21) alpha-IFN and IFN-beta1, IFN-gamma, IFN-lambda in human blood cells from donors. Observational drug effects were different and depended on initial constitutive levels of alpha-IFN. "Immunomax" stimulated donors' IFN-genes with defective activity (absent or lower). Our results demonstrate wide biological and antiviral potential of this drug in human cells in connection with IFN-system, cytokine production and cellular metabolism.

**Key words:** drug "Immunomax"; human cells; gene expression; interferons; interleukines

**IM-1401-022**

α₂-MACROGLOBULIN, LACTOFERRIN AND SOME CYTOKINE LEVELS AT PSORIASIS

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Abstract: We have studied levels of α₂-macroglobulin (α₂-MG), its circulating complex with IgG (α₂-MG-IgG), of lactoferrin (LF), IgG, IL-6, IL-8, IL-1β, TNF-α and IFN-γ in blood serum of patients with vulgar psoriasis depending on the disease gravity, according to the index of PASI, before and after the treatment. It was found out, that the levels of LF, as well as the content of IL-6, IL-8, IFN-γ have significantly increased before and after the treatment regardless the severity of skin manifestations, and α₂-MG -- is reduced only in the severe form, followed by significant increase of α₂-MG-IgG complex concentrations. The number of significant correlations between content of α₂-MG or LF and the levels of the studied cytokines was found. The obtained data confirms the participation of α₂-MG and LF in psoriasis pathogenesis and based on this fact they can be recommended as an additional prognostic tool for this disease.

**Key words:** psoriasis; α₂-macroglobulin; lactoferrin; cytokine; pathogenesis

**IM-1401-025**

SERUM LEVELS, SPONTANEOUS AND INDUCED IN VITRO PRODUCTION IL-17A, IL-2, IL-4, IL-10 IN MALIGNANT TUMORS FEMALE REPRODUCTIVE ORGANS

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Abstract: Analysis of the relation of the main pro- and anti-inflammatory cytokines IL-17A, IL-2, IL-4, IL-10 serum supernatant intact and stimulated in vitro PHA peripheral blood mononuclear cells (MNCs) of cancer patients with malignant neoplasms of the female reproductive organs (n = 31) with histologically verified
diagnoses of cancer of the breast, body and cervix of the uterus stages I–IV, in comparison with healthy donors (n = 17) revealed significant differences (p ≤ 0.05) on regulatory IL-2. The observed increase in serum concentration levels of the spontaneous production of IL-2 in culture MNCs patients with poorly differentiated adenocarcinoma, a rapid progression of neoplasia and involvement of regional lymph nodes. Identified correlations (r = 0.52–0.59) between savorotocnami concentrations levels of spontaneous and stimulated in vitro PHA production of IL-17A, IL-2, IL-4 and IL-10.

**Key words:** spontaneous and stimulated in vitro production of cytokines; IL-17A; IL-2; IL-4 and IL-10.

**IM-1401-029**

**PHENOTYPIC CHARACTERISTICS OF THE MONOCYTE SUBPOPULATIONS CD64⁺CD16⁻CD32⁺CD11b⁺, CD64⁺CD16⁺CD32⁺CD11b⁺, CD64⁺CD16⁺CD32⁻CD11b⁻ IN DEEPLY PREMATURE NEWBORNs WITH CONGENITAL PNEUMONIA**

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**Abstract:** Early detection of infectious-inflammatory and purulent-septic processes in deeply premature newborns is very difficult and extremely urgent in modern neonatology. The aim of our study was to identify the phenotypic characteristics of subpopulations CD64⁺CD16⁻CD32⁺CD11b⁺, CD64⁺CD16⁺CD32⁺CD11b⁺, CD64⁺CD16⁺CD32⁻CD11b⁻ monocytes (Mon) with definition of their diagnostic value in deeply premature newborns with congenital pneumonia varying severity and the respiratory distress syndrome. There was investigated a momentary expression of molecules CD64, CD32, CD16, CD11b on the surface membrane of Mon by the flow cytometry. The testing of the level of their density was done, using detection of the mean intensity of the fluorescence (MFI). For the first time demonstrated the existence of different subpopulations CD64⁺CD16⁺CD32⁺CD11b⁺, CD64⁺CD16⁻CD32⁺CD11b⁻, CD64⁺CD16⁺CD32⁻CD11b⁻ Mon in healthy newborn infants and transformation of the phenotype of these subpopulations in deeply premature newborns with the congenital pneumonia varying severity and the respiratory distress syndrome. These features of quantitative and qualitative transformation of 3 subpopulations of Mon were correlated with the severity of congenital pneumonia in deeply premature newborns. The study of the level of the subpopulation CD64⁺CD16⁻CD32⁻CD11b⁻ Mon can be used as an early diagnostic marker of gravity of inflammatory process in severe congenital pneumonia in deeply premature newborns.

**Key words:** monocytes; phenotype; subpopulations; deeply premature newborns.

**IM-1401-033**

**ANALYSIS OF MULTI-MODAL CHANGE SETTINGS IMMUNITY, DEPENDING ON THE CLINICAL VARIANT UNCOMPLICATED PYELONEPHRITIS DURING PREGNANCY FOR PREDICTING**

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**Abstract:** We studied the parameters of innate immunity in pregnant women in the third trimester with acute gestational pyelonephritis, chronic pyelonephritis in a stage of exacerbation and remission. Control group of healthy pregnant women. The indicators are components of complement C3-, C4-, C1-inhibitor factor N; activity and intensity of peripheral blood neutrophil phagocytosis - phagocytic index (PI), phagocytic number (PN), phagocytosis activity index (PAI); activity oxygen dependent systems of neutrophils in peripheral blood by the reaction of recovery tetrazoly nitro blue, spontaneous and stimulated zimozan, functional reserve of neutrophils (FRN), lactoferrin. The maximum content of C3 and C4 complement components in the group with gestational pyelonephritis, first detected during pregnancy (36,3±2,07 ng/ml, 58,3±4.0 ng/ml). Concentration C1-inhibitor (110,2±19,1 ng/ml) in the group with gestational pyelonephritis on the contrary decreased. Indicators of activity and the intensity of peripheral blood neutrophil phagocytosis (PI 23,2±0,41%, PAI 1,02±0,03) in the group of pregnant women with uncomplicated pyelonephritis reduced, compared with a group of normal pregnancy (50,5±4.2% and 2,9±0,7). Changes in the studied parameters of phagocytosis are most pronounced in the group of pregnant women with newly diagnosed pyelonephritis. There was a trend to increase of activity of oxygen dependent systems of neutrophils in patients with pyelonephritis. The most marked changes in the content of lactoferrin (1518,3±244,2 ng/ml) and functional reserve (9,6±1,05%) of neutrophils in the group of pregnant women with gestational pyelonephritis compared with healthy pregnant
789.7±87.1 ng/ml and 5.8±0.14% respectively.

**Key words:** system of complement; innate immunity; uncomplicated pyelonephritis; oxygen dependent system neutrophils; phagocytosis activity.

**VARIABILITY IN THYMIC SIZE IN CRITICALLY ILL NEONATES: ULTRASOUND IMAGING, CLINICAL AND IMMUNOLOGICAL PARALLELS**

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**Abstract:** The thymus is of extreme importance during the first months of life as it provides the environment for the T-lymphocyte differentiation and maturation. Aim. To assess the variation in size of the thymus in preterm neonates and to identify relations between thymic size, phenotypic characteristics of peripheral blood T-lymphocytes and severity of complications during the first month of life. Patients and methods. We observed 76 preterm neonates (25-34 weeks’ gestation) admitted to neonatal intensive care unit. The thymic size was assessed by sonography as a volume estimate, thymic index (Ti), at 36 weeks of postconceptional age. T cells were analyzed on day 1 (cord blood), 7-8, 14-16, 30 by multicolor flow cytometry. Results. A correlation between thymic size and anthropometric measurements and gestational age was not demonstrated. Infants with low Ti values had a significantly higher incidence of progression to severe necrotizing enterocolitis with intestinal perforation and severe bronchopulmonary dysplasia than infants with median and high Ti values (p<0.05). Analyzing abnormal laboratory data, an association between Ti values and incidence of lymphopenia during the first month of life was not revealed. Ti was positively correlated with CD4+CD25highFoxp3+ T-regulatory cell percentage and absolute counts on days 7-8 of postnatal life (Rs=0.56, p=0.001 and Rs=0.49, p=0.005 respectively). Conclusion. Further elucidation of adaptive immune system in preterm neonates will help to establish new strategies for the treatment and prevention of severe diseases of prematurity.

**Key words:** thymic index; prematurity; extremely-low-birth-weight (ELBW) neonates; necrotizing enterocolitis; bronchopulmonary dysplasia; CD4+CD25highFoxp3+ T-regulatory cells.

**IMMUNO-PCR METHOD: PROSPECT OF APPLICATION**

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**Abstract:** Application of enzyme-linked immunosorbent assays (ELISA) and polymerase chain reaction (PCR) could hardly be overestimated. Specificity of ELISA and sensitivity of PCR were combined in method, termed immuno-PCR. Using DNA fragment as a reporter for antigen-antibody reaction permits to increase the sensitivity of detection 10 -10000-fold compared to analogous ELISA. Immuno-PCR is a high-sensitive method for detection of very small amounts of antigens and antibodies.

**Key words:** Immuno-PCR method, immunosorbent assays, prospect of application

**IMMUNOLOGICAL PARALLELS**

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**Abstract:** Brief review of World congress EAACI-WAO-2013 (June 22-26, 2013, Milan, Italy), where genetic and molecular basis of pathogenesis of immunopathology and allergy and also the improvement of its diagnostics and treatment were discussed. Directions of modern investigations in clinical immunology and
allergology are analyzed, renewed practical recommendations are presented.

**Key words:** pathogenesis, immunopathology, allergy, asthma, atopic dermatitis, drug allergy, food allergy, allergen specific Immunotherapy

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**THE IMPACT OF BENZENE ON THE IMMUNE SYSTEM AND SOME OF THE MECHANISMS OF ITS ACTION**

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**Abstract:** The purpose of this survey was to analyse the modern views on the mechanisms of action and effects of prolonged exposure to benzene on the immune system of humans and experimental animals. In General, on the basis of the stated data, we can distinguish two major provisions: firstly, chronic exposure to benzene has a dampening effect on the quantitative and functional parameters of the immune system of experimental animals and leads to activation of the processes of free radical oxidation (FRO) suppressing antioxidant enzymes; secondly, its immunosuppressive effect benzene implements due to the toxic metabolites, which are formed in the process of metabolism and activation of the FRO.

**Key words:** benzene; immunity; mechanism of action.