

## Sepsis Preventive Maintenance (Blood Infection)

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### Abstract

#### Introduction

The reason - growth of is conditional-pathogenic flora as a result of long vaccination, a syndrome of strengthening of an infection and decrease on this background of immunity.

The is conditional-pathogenic bacterial flora happens, both gramme-positive, and gramme-negative. Toxins which are formed thus - in the first case - exotoxines, they are more dangerous to the person, in the second case - endotoxines, they are less dangerous. The fungoid and virus infection too plays an essential role in sepsis occurrence.

#### Pharmacodynamic Occurrence Sepsis Gramme-Negative

It is carried out through - Toll-like receptors, TLR - the toll-like receptor 4 learns and contacts conservative structure of a cellular wall gram-negative bacteria - lipopolysacharid's.

The reaction outcome endotoxin's with macroorganism cages depends on its concentration. Moderate activation of cages and systems at low doses endotoxin's with dose increase passes in

hyperactivation which is accompanied by strengthened production TNF-alpha and of some others mediators, the strengthened activation of system of complement's and factors of curling of blood that can come to an end with development of such terrible complications as disseminated intravascular curling (DIC), endotoxin a shock and sharp multiorgan insufficiency.

Distal intestines departments are the natural tank gramme-negative microflorae and them endotoxin's with the subsequent detoxication in hepatocytes.

On M. J. Jakovlev to postulate «system endotoxemia's», as a physiological phenomenon of presence endotoxins at practically healthy people, and «endotoxin's aggression», as the universal factor pathogenesis diseases of the person which development is caused by superfluous receipt in general blood-groove LPS (lipopolysacharids) and absolute or relative insufficiency of endotoksin-connecting systems.

Primary targets for endotoxines are monocytes, macropagus, polimorfno-nuclear leukocytes, cages endotelium's, trombocytes and other cages more often. Getting to a system blood-groove, LPS induces emission by these cages cytocynes mediators its actions.

### **Laboratory Changes - Paraclinic**

LPS directly activate myelocutar a sprout of the bone brain, one of which displays is megacariocytoz and leukocytoz, replacing short-term leukopenia's.

At repeating endotoxine attacks again develops leukopenia (as consequence of an exhaustion of reserves myelopoiesis). Reaction of a bone brain can be realised and owing to action of the kolonie-stimulating factors released from activated endotoxine fibroblasts and endothelial of cages which accelerate proliferation and a differentiation of some cages. Thanks to ability LPS to activate fagocytar cages there is an emission liposomal ensymes, metabolism strengthening arachidon acids, acceleration of an oxygen metabolism, that, on the one hand, can cause damage of nearby cages (in particular, endothelial), and from other intensification of processes fagocytoz's. Last can amplify ability LPS to cause activation of synthesis of gamma interferon, fibronectine's and a C3b-component complement's which are powerful opsonines. However on mononuclear phagocytes possess stimulating effect only low doses endotoxines whereas higher, on the contrary, block their basic functions.

Proliferation, a differentiation and activation T - and B-limfocyites therefore it is stimulated as cellular, and humoral a link of the immune answer to any antigenes. It is necessary to do Immunogrammes any level of complexity (the note of the author). In Russia immunologists-allergists often are not able to do decoding Immunogrammes, that essentially makes heavier a life of patients (the note of the author).

Polymorphonuclear leukocytes (PNL) are the basic endotoxin-connecting population of blood cells, and eosinophiles superaffines to LPS cages. It is the LPS-INDUCED oxidant metabolism PNL with an exit of free radicals of oxygen, lysosomal enzymes, leukotrienes and other biologically active connections can lead to development serious pathology at system endotoxemia's, that assumes to carry out reception of Antioxidants (the note of the author) in a rehabilitation phase.

### **Immune Mechanisms of Occurrence of a Sepsis of any Genesis**

It is experimentally shown, that granulocytes can connect endotoxins by means of the Fc-mediated mechanism at the expense of the antibodies of class IgG fixed on superficial Fc-receptors of leukocytes.

The important role in detoxication LPS belongs humoral to factors. Complexes endotoxins with lipoproteids high specific density it is long circulate in a blood-groove and collect in the fabrics possessing the mechanism of specific capture lipoproteids, for example, in adrenal glands. Lipoproteids low specific density (LPLD) raise toxicity LPS at the expense of formation of complexes between their oxidised forms and LPS which get into cages and cause their destruction. Thus oxidised forms lipoproteids in itself are toxic for cages, and endotoxins besides stimulates emission of the enzymes oxidising LPLD. Humoral antiendotoxins the factor antibodies are powerful. High neutralised activity antibodies to O-chains LPS possess, but huge variability of O-chains at gram-negative bacteria reduces probability of a meeting of O-specific antibodies and corresponding endotoxins. Therefore the great value is taken away to antibodies to deep determinants Re-LPS, in particular, to antibodies to Re-glikolipid's.

Endotoxins and antiendotoxins play the important role in physiology and pathologies of pregnant women and newborns. At a birth at children in umbilical blood parent antibodies to endotoxins and antiendotoxins play the important role in physiology and pathologies of pregnant women and newborns. At a birth at children in umbilical blood parent antibodies to endotoxins in the form of IgG to Re-glikolipid's are defined.

### **Parametres of Newborns**

At healthy newborns the maintenance free endotoxins in blood plasma makes  $1,36 \pm 0,1$  pkg/ml (at adults  $1,9 \pm 0,25$  pkg/ml), in endotoxins units from 0 to 1 EU.

At conditions disadaptation early neonatal the period at newborns high maintenance endotoxins in plasma of blood against decrease titr's antiendotoxins antibodies is marked.

At newborns early neonatal the period with indemnification of the period of adaptation maintenance LPS in plasma decreased and a caption of antibodies to Re-glikolipid's accrued.

In process of settling of intestines by microflora growth of level of antibodies (IgG) to endotoxines which maintenance for the fifth days averaged at healthy newborn  $231 \pm 21$  standard units of optical density is observed, that testifies to ability of newborns to synthesise own antibodies.

It is defined, that standard indicators titr's antiendotoxines antibodies at healthy newborn children late neonatal the period make  $213, 4 \pm 5, 6$  c.u. At Children of the first months of a life with a heavy bacterial infection, defeat CNS and the intestinal syndrome, hard proceeding bacterial infections develop against oppression antiendotoxines antibodies.

The favorable current of a bacterial infection (irrespective of an aetiology) is always accompanied by increase, and at heavy forms of infectious diseases reduction of a caption antiendotoxines antibodies. Definition antiendotoxines antibodies needs to be included in standards of diagnostics of a sepsis (the note of the author).

### **Research of Dabs of Blood of Newborns**

At research of dabs of blood of the newborn of the first days of a life 4% LPS-POSITIVE granulocytes, connected endotoxines mothers, transferred transplacental come to light. For 2 days of a life of newborn children in peripheral blood contains  $1, 7 \pm 0, 85\%$  LPS-POSITIVE granulocytes, linkage reserves endotoxine's granulocytes make  $1, 0 \pm 0, 45\%$ . The lowered maintenance in peripheral blood LPS-POSITIVE granulocytes and their low reserve ability connect endotoxines can to testify to insufficiency granocytar link antiendotoxines antibodies (AEA) that is the factor contributing to development of infectious process.

Endotoxemia it is revealed at a fever at children with an immunodeficiency, at 50 % of children with hypotrofia's, at children with a meningitis, at the newborns who have transferred asphyxia, and also at newborns with gram-negative a sepsis. The most frequent clinical manifesto «endotoxine aggressions» is the fever.

At studying of pathogenetic value endotoxemia at children with virus infections high maintenance endotoxines and a low caption antiendotoxines antibodies in first five days of disease, especially at children with complicated current virus infections is noted. In the spent researches direct dependence between concentration plasma LPS and a body temperature at children with virus infections is established.

### **Inverse Relationship Between Temperature Reaction and Activity Antiendotoxines Antibodies is Indicative**

The role «endotoxine aggressions» in initiation and progressing of bronho-obstructive, respiratory distress-syndromes is great. At the bronho-obstructive syndrome complicating current virus infections at children, the pathogenic effect endotoxine aggressions is carried out by means of LPS-OVERLOADED (hyperactivated) granulocytes which get autoarresion an orientation, damage nearby parenchymatous and stromal structural elements of bronho-pulmonary system. In patogenesis this syndrome the important role belongs to the LPS-OVERLOADED alveolar macrophages. Propensity of an organism to allergic reactions and, in particular, to a bronchial asthma, has the most direct relation to «endotoxine aggressions». The clinical supervision which have shown are very important, that normalisation of concentration plasma LPS and

antiendotoxines antibodies (liquidation «endotoxine») brings aggressions at «highly allergic individual» in normalisation of a caption of antibodies to so-called allergens.

For system diseases of a connecting fabric very high caption antiendotoxines (to glicolipid's Re-type) antibodies which can be a consequence of superfluous receipt intestinal LPS is characteristic.

The important role «endotoxine is proved aggression» in occurrence gestosis. Gestosis, preeclampsia and eclampsia are links of one pathogenetic chain that has allowed to qualify the given conditions as obstetric a variant endotoxine a shock.

Clinical «Masks» of Display «Endotoxine Aggressions» are Rather Various.

### **Aetiology of the Most Frequent Reasons of a Sepsis**

*Escherichia coli* (the most frequent activator), *Klebsiella*, *Enterobacter*, *Proteus*, *Pseudomonas* (it is often connected with previous antibacterial therapy and burns; the highest letal), *Bacteroides fragilis* (the most frequent activator anaerobic bacteriemia's), *Staphylococcus aureus* (some straines are capable to produce toxin of a syndrome of a toxic shock), *Streptococcus pneumoniae*.

Sepsis of newborns - *E.coli*, *S.agalactiae* (group B streptococci are a principal cause neonatal a sepsis).

Mushrooms and viruses - (for example, a human immunodeficiency virus - a HIV) are capable to cause generalized defeats endothelium's capillaries which can clinically be shown by the conditions reminding a septic shock though are not those.

The basic information is received as a result of experimental and clinical researches gram-negative a sepsis. The important role in developments of a septic shock and a disease failure is played by high level in plasma endotoxine's (LPS). Formation of complex LPS with LPS-CONNECTING fiber allows it to co-operate with receptor CD14 of macrophages, neutrophyles and endoteliocytes. Linkage with a receptor leads to activation of cages and synthesis proinflammatory cytokynes: the factor TNO-alpha, interlejkina-1 (IL-1), IL-6, IL-12, interferon g (IFN-g), some colony stimulating factors. These substances are capable to regulate set of metabolic functions of an organism that allows to adapt for new conditions depending on a dose. In process of decrease in microbic loading macrophages start to synthesise and allocate cytokines, having anti-inflammatory an effect: IL-10, soluble receptors TNO-alpha, receptors IL-1. Their action is directed on suppression generalized to inflammatory reaction.

Preventive maintenance and treatment of a system inflammation - use - Omera - 3 fat acids - 10% emulsion of high-purity cod-liver oil (Omagaven), containing high quantity others  $\omega$ -3 fatty acids (V. A. Rudnov, 2012).

The certain contribution to increase of a pool of free fat acids brings and Hepatine, being the activator lipoprotein lipaza's and entering into the standard of therapy of a sepsis.

Comparison of a mode of dispensing of a preparation to clinical advantage has shown, that the maximum effect took place at intravenous appointment emulsion pure cod-liver oil in a dose 0, 1-0, 2/kg/days.

Pentoxifiline it is not effective!

### **Sepsis Diagnostics**

1. Immunogramma 3 levels of complexity with definition complement's - in dynamics.
2. Fraction lipids - it is obligatory.
3. Activated a protein C - the death rate forecast!
4. Gamma interferon
5. Antibodies to O-chains LPS and to Re-glikoproteid's
6. Antiendotoxine antibodies

### **Risk Factors**

1. Premature children (septicopyemia newborns) - in 4 - 6 months «are grey - earthy» colours the person, vomiting, do not add weight, the tendency to spleen increase, not a constant fever) - antibiotics are not effective, and even, are harmful! Only general hygienic actions and Immunocorrection!

Low level of the activated protein C (endogen anticoagulant) in plasma - predictor a lethal outcome at newborns with low weight of a body at a birth with septicemia. It needs to be included in diagnostics standards in pediatrics (the note of the author).

2. Decompensate a diabetes, in case of a sepsis levels activated protein C can be both extremely low, and high.
3. Persons, exposed ionising radiation, at adults are observed (a lightning sepsis, sharp septic endocarditis, a sharp sepsis with leukopenia's, it is purulent - resorptive a fever).
4. Persoans with insufficiency hystogematic a barrier
5. Tuberculosis
6. Abort (metroendometritis)
7. Trauma
8. Operation (it is necessary to appoint with the preventive purpose antibiotics before various surgical interventions)
9. Intravenous (IV) introduction contaminated liquids
10. Furuncle
11. Vitamins A and D deficiency

## Early Signs

1. Microbiological the analysis of crops of blood (presence is conditional - pathogenic flora) in bacteriological laboratory of the centre of hygiene. It is better to do the express analysis!
2. Trend to spleen increase
3. Skin displays (dry and damp necrosis skin)
4. Purulent rash (infectious - allergic dermatitis in a kind nettle rash to knotty erithema's - at staphylococcal flora)
5. Cristalina miliaria - small rash about millet in the size, filled with a transparent liquid (more often, at women in the field of a breast and a stomach)
6. Infection - allergic arthritises (large joints)
7. Acute myositis
8. Absence a headache, damp language and euphoria (at a staphylococcal infection)
9. Collaptoid conditions and a hypotonia (gram-negative flora)
10. Sharp mental typhoid delirium (anaerobic a sepsis) - a choice preparation -Amoxicyclin clavulanat and all antibiotics with clavulan acid.

As many allergic reactions, usually enter Glucocorticoids

Attention! (Not to enter)! After remission they aggravate a situation!

Danger consists that the immune system is not intended for struggle with conditional - pathogenic microflora, there is a presence cross reacting with fabrics of the person of antigenes, therefore for 3 - 5 days it is necessary to solve a question on correction measures, then happens late!

## Primary Preventive Maintenance

1. The General Preventive Maintenance of bacterial infections
2. Hardening
3. Use bactericidal medicinal grasses (periodically)
4. Garlic, an onions, a horse-radish
5. Spices. where it is a lot of salt - for adults.
6. Kitchen herbs - for adults
7. Honey (bactericidal properties but not to heat up above 37 degrees on Celsius) - to children-artificial honey to give it is impossible! At the expense of presence Klebsiellas in intestines it is possible - a botulism!
8. Uterine a milk of bees (Apilak)
9. Solution propolis (throat rinsing at the carriage of the tonsils), propolis (it is possible to chew as pitch).

10. Ectericid - drops in a nose.
11. Sangviritrine - 1% solution - to children to dilute in 80 times ex tempore, the adult in 40 times - for a pharynx irrigation.
12. Vitamines A and D - in capsules.

### **Secondary Preventive Maintenance (Course of Treatment Not Less Than 6 Weeks)**

1. Preferably - Aminoglicozids antibiotics in lymphatic vessels to enter (bactericidal action) without occurrence of by-effects. It is very desirable to define pharmacokinetics parametres in plasma of blood at children and at adults!

This group of antibiotics - ototoxic at introduction в/в (can cause decrease in hearing up to irreversible deafness, especially, Gentamycin and Amicacyn). In a lactation to apply it is possible, as through milk preparations of this group do not get. Preparations nephrotoxic, reduce nervously - muscular transfer, Monomycin it is impossible for children till 1 year (easing of breath up to its full stop, a syndrome malabsorcion (infringement suction amino acids, sugars, fat acids). The others Aminoglicozids - till 3 years to appoint it is impossible! After course of treatment by any Aminoglicozids it is necessary to pass a rehabilitation course at the nephrologist - the volume of urine and its concentration (hypostenuria) decreases, urine to become poorly - yellow colour (neomiuria), there can be a fiber in urine (proteuria), there is a loss In - microglobulines, lizocim's, amilaza's, retinol - connecting fiber, kalium's and magnesium, alaninaminopeptidaza's, synthesis PG E (prostaglandin) chokes, level of nitrogen and creatinine's increases. Treatment - vitamin A, preparations kalium's is necessary and magnesium to restore the broken function of kidneys and a campaign to the otolaryngologist - (check of hearing by tuning forks).

2. Cefalosporines (depending on the activator)
3. Amicacin
4. At recurrent a sepsis - a vaccine Antistaphylococcal and Anatoxin or heterogeneous horse antitoxic - antibacterial Antistaphylococcal globulin
6. Aconit (the fighter poisonous) - broth - (10,0-) - to drink once a day 14 days, in 40 days a course it is possible to repeat 1, 5lit of water - only for adults.
7. Efficiency of use of a preparation - Ertapenem at treatment of children with complicated intraabdominal and pelvic infections.
8. At treatment of inflammatory diseases of bodies of a small basin combination Ceftriaxon with Azitromycin's in a dose 1 r in a week within 2 weeks is equivalent by clinical efficiency appointment Ceftriaxon in a combination to a 14-day course of Doxycycline. But this scheme only for adults. Till 14 years Tetracyclines to apply it is impossible!
9. A Sophora Japanese.
10. Imunofan - candles for children, ampoules for i/m applications - for adults.
11. Sangviritrine - tablets from 1-3 years of age - on tablet m to dissolve in water, reception strictly after meal - in 30 minutes. Reception at adults - is similar - doses on 1 tablet on reception. A course is - 5-7 days.



There is no resistance of microflora on this preparation! Courses can be repeated! To do the control microflora presence necessarily! To children - on dabs from a pharynx, a nose, on urine - crops in microbiological laboratory, the adult - by birth.

Attention to the doctor and the pharmacist! Antibiotics which are to a lesser degree capable to cause allocation LPS and endotoxines, are: Carbapinemes, Ceftriaxon, Cefepim, Aminoglicozides, Ftorchinolones, a phytopreparation - Sangviritrine, Imunofan.

Choice preparations at *Staphylococcus aureus* – Oxacyllin, Cefazolin, Derinat i/m for Adults, processing of wounds - 1% solution Sangviritrine's, on follow-up care - Sangviritrine in tablets strictly after meal.

Choice preparations at *Sptertococcus* groups B (*agalacticae*) - Cefepim (Suprax).

Appointment of antibacterial therapy is obligatory. After blood crops usually apply antibiotics of a wide spectrum of action as results of microbiological research will be received later.

In quality etiptropic therapy can apply monotherapy Carbapinemes or the combined therapy by 2-3 antimicrobic preparations:

Cefalosporines + Amidoglicozides + preparations with Antiaerobic activity). Transition to monotherapy after the combined therapy is possible only after reception of results of microbiological research.

At high probability gramm-pozitive community-acquired a sepsis it is possible to apply beta-laktamnye antibiotics with antistaphylococcal activity (Oxacyllin, Cefazolin), and at high probability intrahospital gramm-pozitive a sepsis - glicolipid (Vancomycin) antibiotics.

At suspicion on anaerobic an infection apply Metronidazole or Klindamycin.

Additional quality monitoring of the centre of an infection. Removal of alien bodies. Adequate drainage purulent exudate. Radical removal or sanitation of the centre of the infection, damaged or necrotic fabrics especially important at anaerobic infections.

## **Preventive Maintenance of the Skin Sepsis**

1. Gramycidin - in a combination with Neomycin's and Framycetin's - only for adults!
2. Sangviritrine - 1% solution - cultivations ex tempere - at 40-80 time - for Children.

The final stage of treatment of a sepsis - Antioxidants - for rehabilitation.

Collateral reactions from application of Antibiotics.

Eradication microorganisms from a blood-groove. Theoretically application of some antimicrobic preparations can be dangerous. In experimental conditions it is shown, that interaction of some antibiotics

with gram-negative bacteria can promote concentration increase in blood LPS (endotoxines) with syndrome occurrence bacteriolysis - Jarisha-Gejksgejmera.

Phytopreparations of such collateral actions do not cause (the note of the author).

Sangviritrine - represents a mix of bisulphates quaternary benzophenanthridine alcaloids Sanginarine's and Choleritrine's.

The mechanism of action Sangviritrine's: suppresses bacterial nucleaza's.

The preparation «Ural eyebright» possesses antibacterial activity. Are most sensitive to its action golden and epidermal Staphylococcus which growth chokes at preparation cultivation in 200 times and above.

Stimulating action of a preparation «Ural eyebright» on growth and functional activity of useful microflora of intestines (Lakto - and Bufidumbacterine) is revealed.

The preparation «Ural eyebright» possesses anti-inflammatory activity even at cultivations in 16 and 64 times.

The strong antibiotic is found in structure which has been received from east red cedar. Research (the note of the author) is conducted.

## Conclusions

1. Decoding of pathogenetic mechanisms of influence endotoxines intestinal microflora on an organism of the child is extremely important for various diseases in different age groups, but especially at newborns.
2. Competent treatment of all forms of a sepsis and its treatment is described at all age groups
3. It is required specifications in the form of carrying out of new analyses and their interpretation on the person.
4. Books wait for the edition under all forms of competent treatment of a sepsis, excellent in usual clinical practice.

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