



The Role of Anaerobic Infection in the Etiological Structure of Purulent-Septic Diseases in Infant Children

**Rabbimova Dilfuza
Toshtemirovna**

Samarkand State Medical University, Uzbekistan

Yusupov Fazliddin Tojievich

Samarkand State Medical University, Uzbekistan

ABSTRACT

The article presents the results of a study of biological fluids, the determination of volatile fatty acids

Keywords:

sepsis, young children, volatile fatty acids

Relevance.

The peculiarity of the infectious pathology of recent years is an increase in the frequency of purulent-septic diseases due to a combination of such factors as the emergence and wide spread of opportunistic pathogenic microorganisms strains that are characterized by multiresistance to antibiotics [24; pp. 56, 142; p. 62, 169; c. 251, 189; c. 248] and increased resistance to antiseptics [155; p. 50, 209; c. 71, 217, c. 57], an increase in the number of hospital strains. Many authors explain the increase in the incidence of sepsis by increasing medical "aggression", which means the introduction of complex invasive diagnostic and therapeutic procedures (probing, prolonged vascular catheterization, infusion therapy, tracheal intubation, bladder catheterization) [5; pp. 24, 126; pp. 47, 213; c.1054].

It is currently interpreted that any infectious inflammation is the result of mixed aerobic-anaerobic infection. In the process of their vital activity, anaerobes are capable of

secreting volatile fatty acids (VFA), which are their metabolite markers [12; pp. 94, 139; p.19], and by the change of their content one can judge about the prevalence of anaerobic microorganisms. The intestine is the main place of PLA formation, where up to 1000 mmol of PLA may be formed daily [23; p. 205]. It is known that of LCA, acetic acid is a metabolite of obligate flora and a decrease in its proportion indicates a decrease in the activity of bifido and lactobacilli [11; p.59]. The increase in the proportion of propionic and butyric acids indicates activation of UPF and strict anaerobes (fusobacteria, eubacteria, propionobacteria, bacterioides). A number of studies have shown that volatile fatty acids detected in various biological substrates: blood, saliva, feces and others, reflect the toxic effects of high concentrations of PLA on a number of organs and systems [62; p. 60, 76; p. 499, 88; p. 46], metabolic and structural imbalance of microbiocenosis correlate with clinical manifestations of many diseases, and sepsis is no exception [107; p. 45-46].

To determine the proportion of anaerobic infection in the development of purulent-septic pathology in young children.

Materials and methods of investigation. The paper presents an analysis of the results of examination and complex treatment of 246 infants with purulent inflammatory diseases at the age of 1 month to 1 year, who were hospitalized at the clinic 2 of Samarkand State Medical Institute.

Of the total number of patients, 109 children were with septicemic form of sepsis, 54 with surgical sepsis (Acute destructive pneumonia (SDP) with pulmonary and pleural complications, Acute hematogenous osteomyelitis (OHO), necrotizing neonatal phlegmon (NNP), Necrotizing enterocolitis (NEC), 83 children with localized infection (47 with a local form of purulent inflammatory diseases - osteomyelitis, adenoflegmon, pseudofurunculosis, paraproctitis and 36 with focal pneumonia)

Determinations of volatile fatty acids (VFAs) in biological substrates were performed in patients with sepsis and with local infection to determine anaerobic infection. The gas-liquid chromatography method was performed on a Color 100, model 165 chromatograph with a flame ionization detector to determine microbial markers.

The following parameters were determined:

- total mass concentration of volatile fatty acids;
- absolute content of individual fatty acids (acetic, propionic, oily, valerian, capronic) and the proportion of each acid in the total pool;
- anaerobic index: the ratio of the content of the sum of propionic and butyric acids to the content of acetic acid;
- absolute and relative content of isoacids and the ratio of the sum of isoacids to the sum of the corresponding unbranched fatty acids (butyric, valerian, capronic).

Results Based on the study of markers of anaerobic microorganisms by LCA content by GC method we have revealed that in the structure of the microbiocenosis of a child with sepsis, along with aerobic microflora, an important role is played by anaerobes

(clostridia, peptostreptococci, propionobacteria, fusobacteria, etherobacteria, lactobacilli and bifidobacteria).

The content of markers of anaerobic bacteria from blood was correlated with their content in feces and wound exudate .

The analysis with the determination of the total concentration of PLA and the absolute content of individual (acetic (C2), propionic (C3), oil, valerian (C5) acids, with the study of their profiles, which were calculated according to the formula $(C4)C_n / \sum (C2+C3+C4)$, was carried out. The study of the content of volatile acids in blood serum and feces of the examined children with sepsis and local infection revealed different values of volatile acid concentrations compared with the group of healthy children, indicating quantitative and qualitative changes in the composition of the microbiota in patients.

Table

Quantitative content of LCA C2/C4, anaerobic indices, ratio of total iso C5/C5 in blood serum and feces of the examined patients (sepsis and local infection) and healthy children, $M \pm m$

Group s	Biological material	Acetic acid, mg/g	Propionic acid, mg/g
Control (n=30)	Blood	0,901±0,005	0,071±0,003
	fecal	0,632±0,003	0,189±0,002
Sepsis (n=35)	Blood	0,803±0,002 ***	0,102±0,004 ***
	fecal	0,552±0,003 ***	0,212±0,005 ***
Local infection (n=28)	Blood -	0,902±0,002	0,0732±0,004
	fecal	0,687±0,002 ***	0,168±0,005 ***

Group s	Oleic acid, mg/g	Aerobic index (negative)	IC5/C5
Control (n=30)	0,026± 0,003		
	0,175± 0,002	0,575 ±0,011	1,2± 0,1
Sepsis	0,097±0,006		

(n=35)	***		
	0,235±0,005 ***	0,807±0,011 ***	* 4,8±1, 1*
Local infecti on (n=28)	0,025±0,002		
	0,141±0,002 ***	0,468±0,012 ***	2,13±0 ,1

Note: for $p < 0.05$. * - $p < 0.05$ in comparison with normal group; ** - $p < 0.05$ in comparison between local infection and sepsis groups

The results of the study of these parameters in the examined patients are presented in Table 4.4, from which we can see that in patients with sepsis and local infection the oil and propionic acids in the feces are increased (in sepsis the increase of oil acid is more pronounced, $p < 0.001$), which indicates the activation of conditionally pathogenic flora and strict anaerobes (bacteroids, eubacteria, fusobacteria, coprococci, etc.). The results of the study of anaerobic indices in the feces, reflecting the redox potential in the intestinal lumen, revealed that in local infection the aerobic index is shifted to the area of slightly negative values, and in sepsis - shifted to sharply negative values, compared with indicators of healthy children, indicating "anaerobization" of the environment, in which the inhibition of obligate anaerobes - lacto- and bifidoflora occurs.

The study of the ratio of iso-acids and the ratio of isovaleric acid to valeric acid in local infection showed a decrease in the values of iC_n , iC_5/C_5 ratio, while in sepsis there was a sharp increase in this index, indicating an increase in the activity of aerobic microflora with proteolytic activity in the intestinal lumen of sepsis patients (*E. coli*, hemolytic aerobic strains - *E. coli*, fecal streptococci and anaerobes-*Clostridium*) [Ardatskaya M.I., 2002]. The study of serum LFA content in patients noted an increase in the absolute value of LFA in sepsis, compared with the norm and the group with local infection. At the same time in the blood of patients as well as in the feces of the profile C2-C4 significant decrease of the acetic acid share was revealed along with the

increase of the share of oily and propionic acids that is the evidence of the colonic cells in patients with sepsis being unable to utilize PLA in a normal mode and probably is connected with the increased permeability of the intestinal mucosa at this pathology that is confirmed by N.V. Beloborodova (2000). While studying of LFA content in the blood serum in patients with local infection, no deviations from the norm values were revealed, that explains the integrity of the intestinal mucosa in these patients.

Conclusions.

The change of quantitative and qualitative composition of microbiota, manifested by the increase of oily and propionic acids in the feces of sepsis patients, which indicates the activation of conditionally pathogenic flora and strict anaerobes. In local infection the aerobic index shifts to the area of slightly negative values, and in sepsis it shifts to the area of sharply negative values. In patients with sepsis there is a sharp increase in the ratio of isoacids and the ratio of isovaleric acid to valeric acid, whereas in local infection there is a decrease in this index. This indicates an increase in the activity of aerobic microflora with proteolytic activity in the intestinal lumen in sepsis patients.

References

1. Ермакова М.К. Особенности атопического дерматита у детей на современном этапе //Труды ИГМА: сборник научных статей. Ижевск. 2017. С.76-80.
2. SA Mukhitdinovich, RD Tashtemirovna Comprehensive approach to the problem of rehabilitation of infants submitted sepsis Comprehensive approach to the problem of rehabilitation of infants submitted sepsis// Вопросы науки и образования, 2017 10 (11) 152-156
3. Н.Б. Абдукадилова, Д.Т.Раббимова, З. Хаятова Роль дисплазий соединительной ткани в развитии патологии различных систем организма //Journal of Siberian 3 p 126-135

4. Юсупов Ф.Т. Раббимова Д.Т Some risk factors for digestive complications in children after cardiac surgery with artificial circulation // Journal of Natural Remedies 22 №1 p.129-134
5. Ардатская М.Д., О.Н. Минушкин, Г.А. Елаветина. Нарушение баланса микрофлоры и ее коррекция // Эффективная фармакотерапия. - 2013. - № 41. - с. 58-63
6. Ачилова Ф., Раббимова Д., Ибатова Ш. Нарушение электрической систолы у детей с незаращением межжелудочковой перегородки //Журнал гепатогастроэнтерологических исследований. - 2021. - Т. 2. - №. 3. - С. 60-63.
7. Rabbimova D. Bacteriological investigation and method of antigen connected lymphocytes (ACL) in defining etiological structure of sepsis in children in the early age //Medical and Health Science Journal. - 2010. - Т. 4. - С. 51-54.
8. Mukhitdinovich S. A., Tashtemirovna R. D. Comprehensive approach to the problem of rehabilitation of infants submitted sepsis //Вопросы науки и образования. - 2017. - №. 10 (11). - С. 152-156.
9. Shamsiyev A. M., Rabbimova D. T. Comprehensive approach to the problem of rehabilitation of infants submitted sepsis //Voprosy nauki i obrazovaniya. - 2017. - С. 152.
10. Раббимова , Д., & Юсупов , Ф. (2022). РЕГУЛЯТОРНАЯ ФУНКЦИЯ ВНС ПРИ СЕПСИСЕ У ДЕТЕЙ ПЕРВОГО ГОДА ЖИЗНИ ПО ДАННЫМ КАРДИОИНТЕРВАЛОГРАФИИ. *Журнал гепато-гастроэнтерологических исследований*, 2(3.1), 97–100.
11. Абдукадилова Н. Б., Раббимова Д. Т., Хаятова З. Б. роль дисплазий соединительной ткани в развитии патологии различных систем организма //Journal of Siberian Medical Sciences. - 2020. - №. 3. - С. 126-135.
12. Rabbimova D. Bacteriological investigation and method of antigen connected lymphocytes (ACL) in defining etiological structure of sepsis in children in the early age //Medical and Health Science Journal. - 2010. - Т. 4. - С. 51-54.
13. Rabbimova D. Risk factors and features of septic course in infants //European science review. - 2016. - №. 11-12. - С. 78-79.