PATHOGENIC APPROACHES TO THE TREATMENT OF PATIENTS WITH ACUTE PNEUMONIA PROGRESSING WITH BRONCHIAL OBSTRUCTION

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ABSTRACT

At the analysis of clinical efficiency of differential therapy in the patients with AP with BO the type vegetative nervous system is defined. In the patients with hypersympathicotonic VR (group II) and asympathicotonic VR (III group) during differential treatment there was noted reduction in duration of dyspnea, pulmonary cyanosis, moist pulmonary rales.

In the patients with AP with BO alongside with changes biochemical, immune and vegetative status there was found wrong attitude of the family to the child, and also the psychological behavioral deviations in the child as increased anxiety, aggression; on a background of complex therapy were performed psychological correctional methods of treatment: musictherapy, psychogymnastics, game exercises.

At catamnestic observation within one year of 40 children who have received on a background of other methods of treatment psychocorrection, repeated bronchial obstruction was observed only at 15 % observable children. In control group already through 3 months 45 % of children have addressed with repeated episodes BO at pneumonia and bronchitis.

UDC Code & KEYWORDS

■ 573 ■ PNEUMONIA ■ BRONCHIAL OBSTRUCTION ■

INTRODUCTION

The diseases of the respiratory tract continue to occupy one of the first places in the structure of children morbidity and remain to be the critical challenge in the pediatrics due to their prevalence, high level of incidence and frequent unfavorable outcomes till the present time. Under the conditions of the scientific-technical progress with increase in general sensitization of the population the frequency rate of bronchitis and pneumonia developing with bronchial obstruction (BO) has been significantly raised [3]. The higher rates of unfavourable outcomes of bronchopulmonary pathology developing with syndrome of bronchial obstruction could be probably due to late children's hospitalization, errors in development of the therapeutic strategy and its delayed onset, slow development and introduction of new therapeutic techniques as well as inadequate use of combined forms of therapy taking into account psychological state of a child. In children of young and preschool age the pathogenic bases for BO formation must be studied at the level of all body systems, because the outcomes of bronchopulmonary pathology are mainly depended on the conditions of intrauterine development, genetic peculiarities, heterochronicity of the system and organ maturation, biochemical specificity, degree of immunologic development. [3].

Because the combined use of the most current anti-inflammatory, immunocorrecting, membranostabilizing agents do not result every time in recovery of child with bronchopulmonary pathology, progressing with BO, we

studied characteristics of the vegetative nervous system and psychological status in this category of patients [1,2,4]. The comprehensive analysis of the current clinical-pathogenic and pathophysiological manifestations of bronchopulmonary diseases carried out on the basis of conception about leading role of vegeto-visceral dysfunctions in realization of different pathology in children is the base for use of cariointervalographic parameters during choice of treatment.

The purpose of work was to improve efficacy of treatment of children with acute pneumonia developing with bronchial obstruction with use of vegetotropic preparations and psychocorrecting methods.

MATERIAL AND METHODS

The study included 100 children with acute pneumonia (AP) with bronchial obstruction (BO) of young and preschool age as well as 20 practically healthy children of similar age.

Diagnosis was made on the basis of the data of medical history, results of clinical, functional, biochemical, immunological and psychological methods of investigations.

Diagnosis was formulated according to the recommendations of the "Symposium on improvement of classification of non-specific pulmonary diseases in children"(1995).

In relation to therapy performed the patients were divided into the following groups: group 1 (control) included 40 patients with AP and OB receiving basic therapy: hypoallergen diet, regimen, antibiotics, spasmolytics, antihistamine preparations, symptomatic treatment and physical procedures; group 2 comprised 30 patients with AP and BO with hypersympathicotonic initial vegetative tonus (IVT) with hypersympathicotonic vegetative reactivity (VR) who received on the basis of hypoallergen diet membranostabilizers (calcium antagonist Cordafen, cod-liver oil), polycitamins "Alvitil" and valerian extract additionally to the common treatment. In relation to the result of psychologic consultations according to the indications the psychocorrection was prescribed; group III of 30 patients with AP with BO with hypersympathicotonic IVT with asympathicotonic VR received immunomodulator bronchomunal P, polyvitamin complex "Alvitil" and valerian extract additionally to the traditional treatment on the basis of hypoallergen diet. In relation to the results of psychologic consultations according to the indications the psychocorrection was performed.

For measurement of the calcium content in the blood serum there was performed analysis of the data of the total and ionized calcium. The level of ionized calcium (Ca²⁺) was measured with help of ionoselective calcium electrode on the analyzer of firm "Kone" (Finland), total calcium level (Ca^t mmol/l with use of photometric method with use of test-kits on the analyzer of firm "Labsystems" by unified technique.

In order to study intensity of lipid peroxidation we measured dien conjugates (DC) by method of Palcer et al (1970) and

malone dialdehyde (MDA) in the lymphocyte membranes by method of I.D.Stalnaya and T.G.Gorishvili (1977). All measurements were performed with use of spectrophotometric method on the apparatus (LKB. ULTROSPEC-II).

The content of parathyroid hormones (PTH) and calcitonin in the blood serum were determined by method of radioimmune analysis with use of commercial kits by unified technique.

Immunologic investigations. Determination of the quantity of T-lymphocytes (CD3) and subpopulations: T-helpers (CD4), T-suppressors (CD8), natural killers (CD16), B-lymphocytes (CD19) with use of modified method of Garib F.Yu. (1995), as well as concentration of serum immunoglobulins A, M, G in the peripheral blood by method of Manchini G. et al (1965); neutrophile phagocytary activity by R.V.Petrov's method (1988), which were performed in the Institute of Immunology of the Academy of Sciences of the Republic of Uzbekistan.

The cytokine concentrations such as interleukine 1-beta (IL-1 beta) and interleukine-8 (IL-8) were measured by method of enzyme-immune assay with use of kits of reagents of the manufacturer Limited Company "Cytokine" (St - Petersburg Scientific research institute of especially Pure Biopreparations).

Psychological methods of research.

1. Method of conversation.
2. Method of observation.
3. Test-questionnaire of the parental attitude (A.Ya.Varga, V.V.Stolina).
4. Drawing- tests "House - tree - man", " igure of family".

The data were processed by a method of variational statistics by Fisher-Student.

RESULTS

The analysis of clinical efficiency of differentiated therapy in the patients with AP and BO also showed the type of vegetative nervous system. In the patients with hypersympathicotonic VR (II group) and asympatoco VR (group III) during performance of differentiated treatment, the signs of intoxication were stopped in significantly shorter terms, the duration of dry and wet cough was decreased in comparison with children of group I who underwent traditional treatment ($P < 0,001$). There was noted reduction in duration of dyspnea ($P < 0,001$), pulmonary cyanosis ($P < 0,01$), moist pulmonary rales ($P < 0,001$). There was found reliable difference in manifestations of astheno-vegetative, dyspeptic syndromes. Under influence of complex therapy there was found reduction of weakness ($P < 0,001$) and normalization of appetite ($P < 0,01$).

The analysis of the influence of differential treatment on the biochemical parameters in the patients with AP with signs of BO revealed positive effect. In children of groups II and III of group receiving differential treatment the level of the total calcium was significantly increased up to $2,5 \pm 0,02$ mmol/l and $2,4 \pm 0,02$ mmol/l, respectively, and in group I - $2,0 \pm 0,02$ mmol/l ($P < 0,001$). Level of ionized calcium increased up to $1,2 \pm 0,01$ mmol/l and $1,3 \pm 0,03$ mmol/l, respectively, in comparison with the data of group I ($0,97 \pm 0,02$ mmol/l, $P < 0,001$). Measurement of the level of calcium-regulating hormones in children of group II and III receiving differential treatment showed that the content of PTH was reliably reduced up to $38,0 \pm 2,6$ pg/ml and $39,1 \pm 1,6$ pg/ml, respectively, and level of CT was also reduced up to

$45,6 \pm 2,2$ pg/ml and $46,2 \pm 1,7$ pg/ml, respectively, in comparison with parameters of group I $101,6 \pm 10,7$ pg/ml and $48,6 \pm 3,4$ pg/ml, respectively ($P < 0,001$). It is explained to that the decrease of functional activity of thyroid and parathyroid glands is caused by increase of blood calcium concentration, which on the mechanism of a feedback reduces production of PTH and CT.

During differential treatment of the patients from groups II and III the tendency to normalization of primary and final products of lipid peroxidation was noted, it was shown by reliable reduction of MDA accumulation up to $5,4 \pm 0,2$ nmol/ml and $5,2 \pm 0,3$ nmol/ml, respectively, in comparison with parameters of group I $8,3 \pm 0,2$ nmol/ml ($P < 0,001$). At the same time there was noted decrease in the level of DC up to $2,0 \pm 0,04$ nmol/ml and $1,9 \pm 0,04$ nmol/ml, respectively, in comparison with parameters of group I ($2,8 \pm 0,2$, $P < 0,001$). And, the difference in levels of MDA and DC before and after treatment was reliable only in groups II and III of the patients ($P < 0,001$) while in group I these parameters had no reliable difference ($P > 0,05$).

After carrying out of differential treatment in children of groups II and III there were revealed some changes in the parameters of immune system indicating about more considerable stabilization of the parameters of immunity. This is demonstrated by the parameters presented in Table 1. In children of groups II and III under influence of differential treatment the content of T-lymphocytes after treatment reliably exceeded parameters before treatment ($P < 0,001$), and also parameters of group I ($P < 0,001$).

The subpopulations CD4+ and CD8 + also raised after treatment in both groups, in relation to the initial data, ($P < 0,001$), and also parameters of patients of group 1 ($P < 0,01$, $P < 0,001$). Subpopulations of lymphocytes carrying markers CD8 +, also had positive dynamics under influence of complex therapy, while in group 1 there were no reliable changes in the parameters. Consequently, the immune regulatory index (IRI) in group of the patients who received differential treatment came nearer to normal parameters, as against IRI parameters in group 1 where he remained stably low. IRI after treatment accounted for $2,1 \pm 0,1$ and $2,1 \pm 0,07$, respectively, ($P < 0,02$).

Differential treatment had positive effect on the contents in blood of natural killers – CD16+ lymphocytes. And, the difference in parameters CD16+ before and after treatment was reliable only in the patients of groups II and III ($P < 0,001$), while in group 1 these parameters had no reliable difference ($P > 0,05$). After treatment the parameters CD16 + had no reliable difference in both groups in relation to parameters of group 1 ($P < 0,01$ and $P < 0,02$).

In the patients of group II and III receiving differential treatment the level CD19 + lymphocytes has decreased up to $20,6 \pm 0,3$ % and $19,7 \pm 0,4$ %, whereas in group 1 after treatment - $23,1 \pm 0,7$ % ($P < 0,001$). The complex treatment had positive effect on the parameters of phagocytosis. After the treatment performed the neutrophile phagocytosis was increased in both groups in comparison with parameters before treatment ($P < 0,001$), while in group 1 these parameters had no reliable difference ($P > 0,05$). After treatment the parameters CD19 + reliably differed in both groups in relation to parameters of group 1 ($P < 0,001$). The positive influence of differential therapy on the activity of humoral immunity finds its reflection in the level of concentration of major classes of antibodies of IgA, M, G, their contents in children of group II and III comes nearer to more essential normative parameters and accounts for $104,6 \pm 0,4$ mg%; $910,1 \pm 20,1$ mg%; $111,7 \pm 6,9$ mg % and

105,8±3,2; 911,6±22,5; 112,9±7,2 respectively, as against the patients of group 1 ($P<0,05$; $P<0,02$).

During differential treatment there was noted positive dynamics of CIG parameters: in children of group II and III the stabilization of hypersympathicotonic variant of IVT (73,3 % and 66,7 %) is observed, and also the frequency of sympathicotony (26,7 % and 33,3) increased in relation to the patients of group 1. If before differential treatment in these patients there was registered hypersympathicotonic IVT with hypersympathicotonic VR with the greatest frequency then after treatment there was found more often initial hypersympathicotony with normosympathicotonic VR (53,3% and 50,0%).

In connection with that in the patients with AP with BO alongside with changes of biochemical, immune and vegetative status there were found wrong attitude to the child and family and also the psychological deviations in the child as the increased anxiety, aggression, and on the basis of complex therapy the psychological correctional methods of treatment were used, such as music therapy, psychogymnastics, game exercises. The special attention was given to psychocorrectional conversation with the parents directed to normalization of the relations "mother - child".

After performance of 5-6 lessons the children began to feel more confidently, had more attentive behavior at the lessons, their mood was improved, the anxiety was eliminated, aggression was also attenuated and removed. The catamnestic observation during a year (after 3, 6, and 12 months.) of 40 children who received on the background of other methods the psychocorrection showed that repeated bronchial obstruction was observed only in 15 % of studied children. In control group 3 months later 45 % of children referred to the doctor with repeated episodes of bronchial obstruction in pneumonia and bronchitis.

CONCLUSIONS

2. During bronchopneumonia developing with bronchial obstruction the differential therapy with inclusion of membrane stabilizers, immunomodulators, vegetotropic preparations and if necessary methods of psychocorrection has been proved to be the most rational.

1. The inclusion of the methods of psychocorrection into the complex therapy of the patients with acute pneumonia with signs of bronchial obstruction improves the long-term results of treatment.

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