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# JUVENILE IDIOPATHIC ARTHRITIS IN CHILDREN: CLINICAL PICTURE, DIAGNOSIS AND TREATMENT OPTIMIZATION

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***Summary:*** *The article presents clinical laboratory features and prognostic criteria of juvenile rheumatoid arthritis. The clinical characteristics of the disease and the results of laboratory analysis are important in choosing an effective treatment method. Medicinal and surgical treatment of joints is recommended, depending on the severity of the disease, the characteristics of the clinical flow and the results of the functional laboratory analysis.*

***Keywords****: juvenile rheumatoid arthritis, diagnostics, prognosis.*

**Relevance.**

Juvenile rheumatoid arthritis (JRA) is a destructive inflammatory disease of joints with unknown etiology, complex immunogenic pathogenesis, characterized by symmetric chronic arthritis, systemic lesions of internal organs, which leads to the disability of sick children. Improving the effectiveness of treatment for this disease is therefore a highly topical issue in terms of both scientific and practical pediatrics.

There are many factors that trigger the disease. The most frequent are viral or mixed bacterial-viral infection, joint injury, excessive or supercooling insolation, prophylactic inoculations carried out against the background or immediately after the acute respiratory infection (ARI) of a viral or bacterial nature [3,11,15,17].

It is known that it is the early years of the disease that are decisive in the development and progression of the pathological process. In the earliest period of the JRA, when the process is in the primary, exudative, phase, the reversibility of the

disease is significantly higher due to the still-inconclusive autoimmune mechanisms and the absence of a pannus, the morphological basis of the joint destruction [4,8,9,11,12]. It has been shown that within 2-4 months of the onset of the disease, there are morphological signs of chronic synovitis in the joints. Numerous studies of the JRA have shown that erosion changes in joints also occur at an early stage. For example, an X-ray examination of 90 patients with early (<1 year) Over the next three years, it was found that changes in the joints of the brushes and the stop occurred in 70% of cases [ 1,2,3,7 ]. According to most recent studies, 25% of patients have erosive joint changes already in the first year of the onset of clinical symptoms of the JRA [ 7,8,10,12 ]. Clinical dynamics - laboratory manifestations of juvenile rheumatoid arthritis (JRA) - one of the widely debated difficulties of JRA rheumatology, The relevance of which is explained by two main factors - the subtleties of the disease in babies with different debut variants and the effectiveness of all possible approaches of basic therapy. The results of the retrospective studies of the ADP reflect the scientific and practical statements of reviewers on the evolution of the disease - the number of patients with continuous development of the disease ranges from 33% to 75%, some researchers estimate that only 10 - 20% of patients have the most severe disability, and most infants have a favorable illness (1-4). At the same time, the literature also shows the negative dynamics of the JRA - the functioning of gross functional deficiency of 30% of cases and disability - in 51.5% of patients with different debuts.

Purpose of the study. Study clinical and laboratory manifestations of juvenile rheumatoid arthritis and determine predictive outcome criteria.

**Material and methods.**

Eighty-four children between the ages of 3 and 16 (average age 11) with rheumatoid arthritis were monitored, of whom 74 (per cent) were articular and 10 (per cent) were systemic. Of the cases examined, 47 (56 per cent) were boys and 37 (44 per cent) were girls. The patients were divided into two groups depending on the treatment provided: 54 patients constituted the main group that received

chronotherapy by nimesulide and 30 patients with traditional therapy Nsaids formed a comparison group. The control group consisted of 20 practically healthy children.

The development of the disease may be preceded by trauma, bacterial and viral infection, including ARI, preventive vaccination, insolation, psychological trauma. The distribution of the factors causing the development of the JRA among the patients we observe is shown in Table 1.

**Table 1.**

**Triggering factors of the JRA**

| **Factors** | **Age** | | | |
|---|---|---|---|---|
| | **up to 7 years** | | **over 7 years of age** | |
| | **abs.** | **%** | **abs.** | **%** |
| Hypothermia | **9** | **10.7** | **36** | **42.8** |
| Infectious diseases | 5 | 6.0 | 12 | 14.3 |
| Trauma | - | - | 1 | 1.2 |
| Allergy | 4 | 4.8 | 6 | 7.2 |
| Unknown | 2 | 2.4 | 8 | 9.5 |
| **In total:** | **20** | **23.8** | **64** | **76.2** |

As can be seen from the table, hypothermia has been observed as a provocative factor for most patients of both pre-school and school age. Of the infectious diseases, 11 had severe ARI, 3 had anamnesis from pneumonia in the last 3 months, 2 had acute intestinal infection and 1 had follicular angina. In third place, allergies are the trigger factor: allergic to 4, allergy to 3, allergy to 2, and polynosis to 1.

Rheumatoid activity evaluation process using index DAS 4 we carried out considering clinical guidelines E.L.Nasonova: 1st degree of activity was aevaluated at the values DAS 4 <2.4 units 2nd degree of activity was characterized by values in a range of 2.4 < DAS 4 <3.7 units, respectively, 3rd degree - with DAS 4> 3.7 units. It was revealed that the average DAS 4 values in the groups approximately corresponded to the established boundaries ( Table 2).

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**Indicators of activity of the rheumatoid process using the DAS 4 index in the examined patients.**

| Indicator | 1st degree of activity | 2nd degree of activity | 3rd degree of activity |
|---|---|---|---|
| Das4 | 1.37 -2.29 | 2.48-3.7 | 3.71-4.54 |

The calculation of the DAS 4 indicator in dynamics, even in the absence of significant differences with the initial value, established a higher level of activity. An intragroup analysis of DAS 4 indicators found that in the group of patients with minimal activity, the parameters did not change significantly or tended to decrease in most children. In patients with the 2nd degree of activity in 19 (59.3%) cases an increase in DAS 4 was detected , in 13 (40.6%) cases there was a slight decrease or absence of parameter changes.

**Result and discussion**

The polyarticular variant of the JRA was observed in 35 patients examined, of which 6 were seropositive for the rheumatoid factor. In the seropositive subtype, the start with symmetric polyarthritis was noted. The wrist and foot joints were usually affected. Structural changes in the joints developed during the first six months of the disease. By the end of the first year, diseases in the joints of the wrist formed ankylosis in two patients. One patient developed destructive arthritis. According to literature, this form of JRA is the early debut of adult rheumatoid arthritis.

The joint-visceral form was observed in 10 of the patients we examined and was characterized by a high temperature reaction, which was intermittent and did not decrease when treated with antibiotics. The fever was accompanied by a polymorphic rash of bright pink. All groups of peripheral lymph nodes have increased. Several joints were involved - knee, ankle, elbow, neck. All the joints were painful and swollen. There was an increase in liver and spleen size.

**Table 3.**

**Frequency of JRA x-ray criteria**

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| Stages | Signs | abs. | % |
|---|---|---|---|
| **1** | Epiphyseal osteoporosis | 53 | 63.1 |
| **2** | Joint cleft constriction, single erosion | 27 | 32.1 |
| **3** | Destruction of cartilage and bone | 3 | 3.6 |
| **4** | Fibrous and bone ankylosis | 1 | 1.2 |

As can be seen from the table, half of the patients we examined had the first stage of anatomical changes for Steinbrocker, i.e. epiphyseal osteoporosis, and in 1/3 patients we found that the joint slit was constricted and that there was single erosion. Destruction of cartilage and bone occurred in three patients with a disease lasting more than three years. Ankylosis formed in a sick girl with Still syndrome.

The treatment of various forms of ADR, particularly severe and progressive, is a complex task requiring the joint efforts of the doctor, the sick child, his parents and the family as a whole. Effective therapy leads to the achievement of remission of the disease and improvement of the patient's quality of life. The emergence in recent years of new biological agents (infilksimab, ethanercept, rituksimab, adalimumab, etc.) that have a significant impact on the course of the disease, and the first experience with some of them offers hope for improving the outcome of the disease.

We have developed algorithms for predicting the health of schoolchildren. In Table 5 of Wald's successive analysis, each topic has a numerical value with a (+) or (-)sign. The numerical threshold for accepting a certain conclusion (with 95% probability) is 13. It is obtained by the algebraic addition of the predictive coefficients of each proposed topic in the table.

Already after the first two weeks of using COX-2 inhibitors, 57.4% of patients showed an ACR20 response, 24.1% of patients showed an ACR of 50, and 3.7% showed an ACR70. By the 8th week, the effectiveness of the drug was observed in 80% of patients, of which ACR20 response was achieved in 15%, ACR50 in 35%, ACR70 in 30%. In addition, there was an improvement in the well-being of patients, an increase in overall activity, a decrease in the severity of symptoms of intoxication, and a decrease and normalization of laboratory activity indicators . In 44 patients with

the articular form of the disease and 10 with the systemic form of Jura who completed the treatment of COX-2 inhibitors, the dose of glucocorticosteroids was reduced. The average daily dose of prednisone at the 8th week of COX-2 inhibitors COX-2 inhibitors was effective not only against early arthritis, but also in patients with a long history. Given the good response to therapy, 11 children received prolonged therapy of COX-2 inhibitors.

The results confirm the efficacy and safety of COX-2 inhibitors in the treatment of refractory, long-lasting Jurassic. After 6 months in patients who received COX-2 inhibitors in complex therapy, the disease activity significantly decreased. They reliably ($P < 0.05$) decreased the number of joints with exudation and painful joints, decreased the Richie index and the value of the DAS4 index.

**Conclusions.**

1. On the basis of the complex of clinical-laboratory and instrumental and functional methods of investigation, the clinical variant of the disease, the level of its activity and the features of the current have been clarified. This is the basis for the development of a range of treatment measures.
2. Applying a predictive approach to determining the threat of adverse outcome of the ADP is a modern and effective way of preventing disease progression and choosing the most appropriate therapeutic tactic option.

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