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THE CLINICAL COURSE OF JUVENILE RHEUMATOID ARTHRITIS OF THE CHILDREN FROM THE ADVERSE RESIDENCE AREA

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ABSTRACT

Background: According to the results of various studies, prevalence of JRA is from 2 to 19 cases per year per 100,000 of the population, and frequency of the disease varies in different ethnic groups, in connection with which a genetic predisposition is assumed in etiology of this pathology, as well as influence of environmental factors, such as climatic-environmental and geographical conditions **Objective:** to achieve this goal dynamic observation data were analyzed including the results of a complex examination of 315 children with JRA at the age of 7-16. **Result:** The risk factors contributing to occurrence of juvenile idiopathic arthritis include: a burden of a family history of rheumatic diseases; a complicated obstetric and gynecological history of a mother; a pathology of pregnancy and childbirth; early conversion to artificial feeding; frequent infectious morbidity preceding development of juvenile idiopathic arthritis. The clinical picture of children with JRA living in an environmentally favorable region was different from that of children living in an unfavorable region by the course nature of the disease. Juvenile rheumatoid arthritis of children from an unfavorable region was characterized by torpidity, a tendency to persistence and prevalence of a pathological process.

KEYWORDS: Juvenile rheumatoid arthritis (JRA), clinic, risk factors, ecology.

INTRODUCTION

According to the results of various studies, prevalence of JRA is from 2 to 19 cases per year per 100,000 of the population, and frequency of the disease varies in different ethnic groups, in connection with which a genetic predisposition is assumed in etiology of this pathology, as well as influence of environmental factors, such as climatic-environmental and geographical conditions.[1, 2, 5]

An important role in etiology of JRA is given to the environmental factors. It is known that under influence of the environment on a human body, inherited changes (mutations) can occur. Constant environmental degradation, ultimately, can lead to a decrease of the protective properties of a human body, which will cease to resist various diseases.[3, 4, 7]

At present, adverse environmental situation in the Republic of Karakalpakstan has put a heavy burden on the entire population as a whole, it is especially dangerous for the child population, in particular, children with JRA, since a child's body due to its functional immaturity of tissues, adaptation and protection systems is especially sensitive to influence of a complex set of the environmental factors.[4, 5]

In view of the above, **the aim** of this work is study of the specific features of the JRA clinical course of children, depending on their place of location.

MATERIALS AND RESEARCH METHODS: to achieve this goal dynamic observation data were analyzed including the results of a complex examination of 315 children with JRA at the age of 7-16. The 162 of these patients who live in the city of Tashkent and in the province of Tashkent made up the 1st group, and the 153 patients who live in the Republic of Karakalpakstan made up the 2nd group. The diagnosis was made on the basis of clinical, laboratory and instrumental studies.

Statistical analysis of the data was performed by methods of variation statistics. The differences were considered statistically significant at $P < 0.05$.

RESULTS OF THE STUDY: Frequency of JRA occurrence among the two ecological regions was analyzed. Attention was paid to the fact that frequency of JRA was dependent on the specific region. So, if in the ecologically favorable regions the incidence was 2.59 per 1000 children and adolescents, in the ecologically unfavorable regions it was almost 1.5 times higher - 3.68 per 1000 children. For the last 15 year- period there has been marked increase of frequency of JRA detection of

children what is likely due to improvement of the diagnostic methods.

JRA manifestation is characteristic of children under a constant environmental stress what confirms the earlier assumption that juvenile rheumatoid arthritis is a genetically determined disease, and the environmental problems together with all equal conditions can play the role of a disease trigger.

A hereditary burden was typical for the most children of the 2nd group with JRA - 72.5% (111) of the children. On the maternal side, the hereditary predisposition made up 56, 8% (63 children), on the paternal side – that of 43.2% (48 children.)

The hereditary predisposition among the sick children of group 1 made up 33.3% (54 children.) Thus, on the maternal side, the hereditary predisposition made up 57.4% (31 children), on the paternal side – that of 42.6% (23 children) (Fig. 1.)

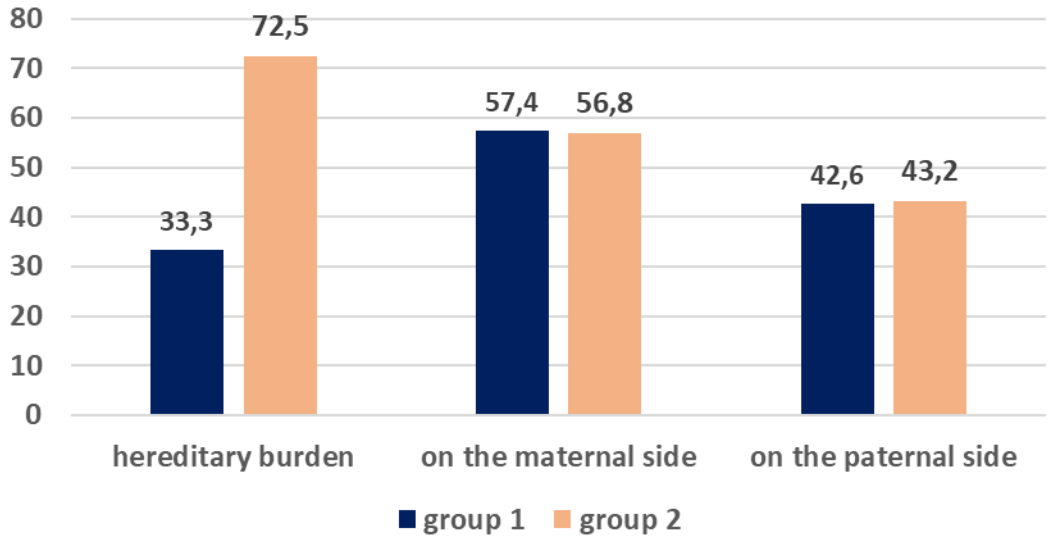

Fig. 1: Indicators of the hereditary burden with JRA.

Taking into consideration a high level of birth of children with a predisposition to JRA due to the viral infections endured, the effects of teratogenic factors on their mother's body during pregnancy it was of certain interest to analyze the course of pregnancy of the mothers of the children we observed.

This analysis was made among 124 children of group 2 and 59 children of group 1. The 77 (62.1%) pregnant women of the 2nd group had a threat of termination of pregnancy in the first trimester; the 12 – suffered from SARS (9.7%); every third woman suffered from chronic pyelonephritis (42 - 33.8%); the 21 (6.5%) suffered from various diseases of the genital area (trichomoniasis, gardenenosis, chlamydia, etc.); the 4 (3.2%) – from viral hepatitis B and C; the18 (14.5%) patients had thyroid disease; the 28 (22.6%) took hormonal drugs during pregnancy; the 45 (36.3%) were engaged in agriculture and had contact with pesticides and the 16 of them (12.9%) - with paints and varnishes.

Only half (29 - 50.9%) of the mothers of the children of the 1st group suffering from JRA and living in the environmentally favorable region had a threatened termination of pregnancy. SARS was endured by the 3 (5.3%) mothers in the III trimester of pregnancy. The 11 (19.3%) mothers had diseases of the genital area. The 12 (21.05%) took hormonal drugs during pregnancy. Despite all of the above facts that negatively affect the fetus during pregnancy, most children were born in a satisfactory condition. However, the highest frequency of factors negatively affecting a fetus was found among the children from the unfavorable region.

More than half of the examined sick children were breast-fed (65 - 52.4% and 30 - 52.6%, respectively).

Among children's infections, a chickenpox was most common (71 - 57.2% and 29 - 50.9%); so, every fifth child had measles rubella - 25 (20.1%) and 12 (21.05%), respectively. At the same time, children practically did not have SARS, catarrhal diseases 8 (6.4%) and 2 (3.5%), and intestinal infections (5 - 4.0% and 2 - 3.5%). Allergic conditions were quite frequent companions of JRA - more than half (72 - 58.06%) of children identified one or another allergic disease. Protein intolerance to cow's milk was found among 15 (12.09%) and 7 (12.3%) children.

It was of interest to study localization of the pathological process of the observed children (Fig. 2).

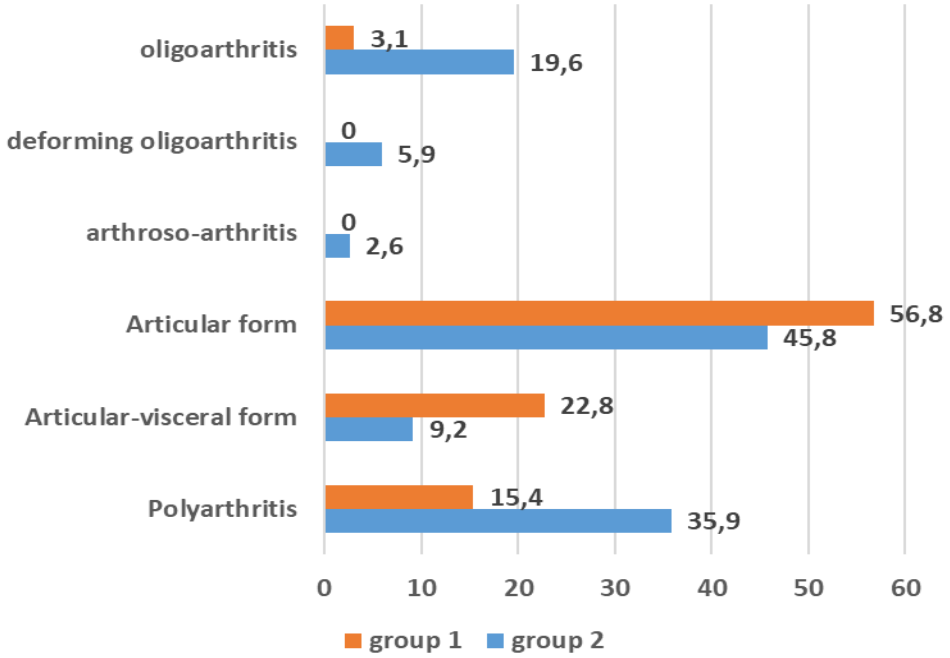

Fig. 2: Characterization of patients by the JRA options.

Among the examined children, the 13.7% were patients with an oligoarticular variant of JRA, and these are children in most cases (28.1% versus 3.1%) living in the unfavorable region. The articular form of JRA was found in almost the same percentage in the both groups (56.8% and 45.8%), the articular-visceral form with a predominance in the group of children living in the favorable region (22.8 and 9.2%, respectively).

The children of group 2 had a rapidly progressing course of the disease, while the children of group 1 had a slowly progressing course of the disease. Functional changes of the most patients of the 1st group corresponded to 1-2 functional classes. However, the children of the 2nd group corresponded to classes 2-3 more often. Radiological changes did not depend on the place of residence of the children and corresponded to stages 1-2 (table. 2).

Table 3.3: The peculiarities of the JRA course of the observed children.

Indicators		Groups			
		1 group		2 group	
		Abs.	%	Abs	%
Degree of activity	I	3	12.0	32	64.0
	II	13		10	20.0
	III	10	40.0	8	16.0
Course of the disease	fast progressing	13	52.0	0	0.0
	slowly progressing	12	48.0	50	100.0
X-ray stage	without changes	2	8.0	22	44.0
	I	10	40.0	15	30.0
	II	10	40.0	11	22.0
	III	3	12.0	22	4 4.0
	IV	0	0.0	0	0.0
Federal Tax Service	I	6	24.0	28	56.0
	II	12	48.0	19	38.0
	III	7	28.0	3	6.0

In the group of children we observed the first degree of disease activity prevailed in most cases with all variants of JRA, more often ($p < 0.05$) the children suffering from oligoarthritis.

Analysis of the frequency of lesions of various groups of joints of the children with JRA at the onset of the disease showed that in more than half of 22 (57%) cases of our observations, the knee joints were the first to be affected, the ankle joints in second place (8%), then the wrist and small joints 4 brushes (10.5% each). It was extremely rare, or rare, that the elbow joints, as well as the joints of the cervical spine, were involved in the pathological process.

Of all the children sick with JRA examined by us, radiological changes in the joints of 55% of the patients were characterized by moderate epiphyseal osteoporosis, which corresponds to the first radiological stage, in 34% of cases the second stage was determined, and in 9% - the third stage. Only 1 (2.6%) patient with polyarticularjoint damage during X-ray examination showed the formation of fibrous ankylosis, which corresponds to stage IV.

Functional changes in the joints, according to the criteria of Steinbrocker (Cassidi JT et al. Textbook of Pediatric Rheumatology. Toronto: WB Saunders Company, 2002. P. 819), in the vast majority of cases were within the first two degrees. At the same time, II degree of functional insufficiency in 90% of cases was found out among the patients with a polyarticular debut of JRA what is somewhat more often than those with the oligoarticular (90% versus 64%) and significantly more often ($p < 0.05$) than with systemic JRA debut. Only 2 patients (9%) with systemic, and 2 (10%) with a polyarticular variant of the disease had a restriction in the functional ability of the joints, limiting self-care, which corresponds to III degree. Class IV of the functional disorders was not detected among any patient.

Extraarticular manifestations of the disease in the JRA debut of the observed group of patients were diverse and related mainly to the systemic variant of the course of the disease. So, in the systemic version of the onset of the disease, fever was present in all 100% of patients, anemia - in 50%, polymorphic rash - in 55%, lymph node enlargement - in 42%. Secondary heart damage in the form of pericarditis and endocarditis was observed among 21% of children, interstitial nephritis also developed among those of 23%, hepatomegaly - among 18% and pneumonitis – among 10.5% of the patients. One patient with a systemic variant of the disease had a hemorrhagic syndrome in the debut.

Rheumatoid nodules were not detected in any of the clinical variants of the course of the disease.

Uveitis was diagnosed among 7.8% of the children in the JRA debut, 10.5% of the patients suffering from oligoarthritis and only 2.6%- from with a polyarticular variant of the disease. Over the next period (from 1 to 3 years), uveitis was developing among another 15 patients (9 children with oligoarthritis and 6 with polyarthritis.) It should be pointed out that in the systemic version of JRA uveitis did not occur at all.

Summarizing the above stated, it can be **concluded** that among the children with JRA, the average age for the onset of the first clinical symptoms is 5.7 ± 4.6, while the systemic version of the debut manifests earlier than the polyarticular one. Joint syndrome among children with this pathology can be characterized by a different degree of its activity, but with the oligoarticular version of the debut, it is predominantly (more than 70%) I degree; functional changes in the joints, in accordance with the criteria of Steinbrocker correspond mainly to 1-2 degrees; visual functional impairment is observed among 15% of the children with juvenile idiopathic arthritis and only with systemic and polyarticular variants of the course of the disease.

The risk factors contributing to the occurrence of juvenile idiopathic arthritis include: a burden of a family history of rheumatic diseases; complicated obstetric and gynecological history of the mother; pathology of pregnancy and childbirth; early conversion to artificial feeding; frequent infectious morbidity preceding the development of juvenile idiopathic arthritis.

The clinical picture of the children with JRA of group 1 differed from that of the children of group 2 according to the nature of the course of the disease. Juvenile rheumatoid arthritis among the children we observed was characterized by torpidity, a tendency to persistence and prevalence of the pathological process.

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