THE DIVERSE AND HETEROGENEOUS CLINICAL FEATURES OF JUVENILE PSORIATIC ARTHRITIS

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VARIJABILITET I HETEROGENOST KLINICKIH MANIFESTACIJA JUVENILNOG PSORIJATICNOG ARTRITISA

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ABSTRACT

Juvenile Psoriatic Arthritis (JPsA) is a chronic inflammatory disorder that accounts for 3-10% of all juvenile arthritis. The main objective is to identify the clinical features of psoriatic arthritis in children. This study was open-label, single-center, prospective, observational (1989-2020) cohort clinical study included 85 patients (3-17.0 y/o) who met Vancouver and I/E criteria. The features of skin and articular syndromes in children with JPsA were revealed. In most patients with PSA, the disease began at the age of 6.6 years. In childhood, arthritis is usually preceded by psoriasis. The most common clinical form of psoriasis is plaque psoriasis. At the onset of the disease, symmetric polyarthritis predominates. During the disease, transformation of the joint syndrome with a predominance of rheumatoid arthritis is noted. All observed patients showed pronounced osteoporosis, which is not characteristic of JPsA.

Keywords: Vancouver diagnostic criteria, psoriasis, juvenile psoriatic arthritis, juvenile idiopathic arthritis.

SAŽETAK

Juvenilni psorijatični artritis (JPsA) je hronični inflamatorni poremećaj koji čini 3-10% svih juvenilnih artritis. Glavni cilj je da se identifikuju kliničke karakteristike psorijatičnog artritis kod dece. Ova studija je bila otvorena, jednocentrična, prospektivna, opservaciona (1989-2020) kohortna klinička studija uključivala je 85 pacijenata (3-17,0 godina) koji su ispunjavali Vankuverske i I/E kriterijume. Otkrivene su karakteristike kožnih i zglobnih sindroma kod dece sa JPsA. Kod većine pacijenata sa PSA, bolest je počela u dobi od 6,6 godina. U detinjstvu, artritisu obično prethodi psorijaza. Najčešći klinički oblik psorijaze je psorijaza plaka. Na početku bolesti prevlađuje simetrični poliartritis. Tokom bolesti primećuje se transformacija zglobnog sindroma sa prevlašću reumatoidnog artritis. Svi posmatrani bolesnici su pokazali izraženu osteoporozu, koja nije karakteristična za JPsA.

Ključne reči: Vankuverski dijagnostički kriterijumi, psorijaza, juvenilni psorijatični artritis, juvenilni idiopatski artritis.

INTRODUCTION

Psoriatic arthritis (PsA) is a chronic inflammatory joint disease that develops in about a third of patients with psoriasis (1). Juvenile Psoriatic Arthritis (JPsA) is presented in 4 - 9% of children with juvenile arthritis (2,3).

The criteria for the International League of Associations for Rheumatology (ILAR, 2001) and the Vancouver Criteria (1989) are used to diagnose JPsA (4, 5).

According to the ILAR criteria, Definite JPsA was defined as arthritis associated with psoriasis, or arthritis and at least 2 of the following: dactylitis, nail pitting or onycholysis, psoriasis in a first-degree relative. Exclusions criteria: arthritis in an HLA-B27 positive male beginning after the 6th birthday; ankylosing spondylitis, enthesitis related arthritis, sacroiliitis with inflammatory bowel disease, Reiter's syndrome, or acute anterior uveitis, or a history of one of these disorders in a first-degree relative; the presence of IgM rheumatoid factor on at least 2 occasions at least 3 months apart; the presence of systemic JIA in the patient (4). Psoriatic arthritis is a form of arthritis that affects some people with psoriasis. Psoriasis is a chronic skin and nail disease characterized by red, scaly rashes and thick, pitted fingernails. About one-third of children with psoriasis will have psoriatic arthritis. Psoriatic arthritis is a form of juvenile idiopathic arthritis (JIA) and is characterized by chronic joint inflammation and swelling, as well as an increased risk for asymptomatic eye inflammation. Psoriatic arthritis accounts for approximately 6 percent of all cases of juvenile arthritis. Although the cause of psoriatic arthritis is unknown, factors such as immunity and the environment may play a role. Genetics also appear to be involved: 40-80 percent of children with psoriatic arthritis have an affected first- or second- degree family member, such as a sibling, parent, grandparent or aunt/uncle.

Therefore, in pediatric rheumatological practice, the Vancouver criteria are more often used (5). According to Vancouver criteria Definite JPsA is defined as arthritis associated, but not necessarily coincident, with a typical psoriatic rash, or arthritis plus at least 3 of 4 minor criteria: dactylitis, nail pitting, psoriasis-like rash, or family history of psoriasis. Probable JPsA is defined as arthritis plus 2 of the minor criteria.

The clinical picture of JPsA is diverse and heterogeneous. There are no specific laboratory tests. Instrumental methods reflect only the presence and severity of the inflammatory process. JPsA is an interdisciplinary problem and requires the joint supervision of rheumatologists and dermatologists.

The main aim of this study was to identify the clinical features of psoriatic arthritis in children.

METHODS

Design of study

This study was open-label, single-center, prospective, observational (1989-2020) cohort clinical study included 85 patients (3-17.0 y/o) who met Vancouver and I/E criteria.

Data collection presentation and follow-up

Patients' charts were reviewed for the following clinical variables at presentation and at each follow-up visit: height, weight, joint involvement, presence or absence of symmetric arthritis, nail pits, dactylitis, presence of psoriatic rash or psoriasis-like rash, and uveitis. All medications, including corticosteroid joint injections, were recorded for each visit. Patient visits at presentation 1, 3, 6, 12, 36, and 60 months following the first presentation and every 5 years thereafter were used. Serologic variables studied were: a) Rheumatoid Factor (RF) as detected by latex agglutination; a positive test result was defined as titer ≥ 2 on at least two occasions (data were available on 88% of patients); b) Anti-nuclear antibody (ANA) as detected by immunofluorescent microscopy using the Hep2 cell line. A positive result was defined as a titer $\geq 1:40$ on at least one occasion (data were available on 88% of patients); and c) HLA B-27 antigen (data were available on 44.5% of patients).

The following complications were recorded at each visit: presence of a joint contracture, and presence of leg-length discrepancy. The Childhood Health Assessment Questionnaire (CHAQ) (14) was available at last follow-up in 73.1% of the patients. For patients with uveitis the final visual acuity and ocular complications were obtained (15).

Definitions

The diagnosis of psoriasis was made by a rheumatologist and/or dermatologist. Rashes thought likely (but not definitively) to represent psoriasis were considered psoriasis-like.

Polyarticular involvement was defined by the involvement of ≥ 5 joints cumulatively at any point over the course of study. Oligoarticular arthritis was defined as involvement of < 5 joints: a) persistent oligoarthritis- < 5 joints throughout the disease course; or b) extended- ≥ 5 were involved at any point after the initial 6 months. Enthesitis was defined as tenderness at a tendinous, ligamentous, capsular, or fascial insertion into bone. Dactylitis was defined as digital swelling extending beyond the margins of the joints. Patients with dactylitis were not considered to have involvement of the corresponding joint(s) with arthritis unless it was specifically documented.

Symmetric arthritis was defined as being present if the number of affected joint pairs divided by the total number of joints involved was $\geq 50\%$. The following 11 joint pairs were used: shoulders, elbows, wrists, any metacarpophalangeal (MCP), any proximal interphalangeal (PIP) of the

hand, hips, knees, ankles, any metatarsophlangeal (MTP), any PIP) of the foot, and the temporomandibular (TMJ).

All descriptive data were expressed as the mean $\pm$ standard deviation (SD). Comparisons between groups were performed using Chi-Square Tests with Bonferroni corrections. All data are presented in form of the Tables and Figures.

Statistic methods

RESULTS

In this study we observed 85 patients with JPsA aged from 3 to 17 years. Fifty-nine (70%) patients had definite JPsA and 24 (20%) had probable JPsA, according to the

Vancouver criteria. The clinical and demographic characteristics are presented in Table 1.

Table 1. The clinical and demographic characteristics of patients with JPsA (n=85)

Demographic indicators		JPsA	
		Definite	Probable
Number of patients (n)		60	25
Girl/Boy Ratio		1,7:1	2:1
Average age, years		6,6 $\pm$ 4	6,3 $\pm$ 2,7
Duration of the disease, years		3 $\pm$ 2	
Family history of psoriasis n, (%)	First-degree relative with psoriasis	22 (26%)	
	Second-degree relative with psoriasis	34 (41%)	
Potential trigger n, (%)	Infection	22 (27%)	
	Trauma	12 (14%)	
	Vaccination	7 (8%)	
	Insolation	5 (6%)	
	Stress	3 (4%)	
	Not identified	34 (41%)	

In 18 (30%) children with definite JPsA, skin lesions presented as the first sign of the disease, joint damage in these patients developed after 3.5 ± 2 years. In 29 (49%) patients' articular syndrome was observed on the onset with subsequent skin manifestations after 5.3 ± 3 years. Fourteen (23%) children with definite JPsA had simultaneous debut of skin and articular syndromes.

Among 60 patients with definite JPsA, vulgar psoriasis was observed in 46 (76%) patients, guttate psoriasis in 10 (15%), isolated nail psoriasis in 3 (5%), and palmoplantar psoriasis in 2 (4%). Fifteen (28%) patients had a combination of cutaneous psoriasis with damage to the nail plates (Figure 1).

Figure 1. Vulgar psoriasis in patient with JpsA

Articular syndrome in the onset of the disease was represented by oligoarticular arthritis in 58 (70%) patients, in 16 (19%) children - symmetric rheumatoid-like arthritis, and in 11 (13%) - spondylitis. The most commonly involved joints at both presentation and during the course of the disease were the knee (41%), ankle (31%), and small joints of the hands (29%). During course of the disease, the articular syndrome

transformed with symmetric rheumatoid-like arthritis prevalence.

All joint groups in PsA may be involved in the pathological process. However, knee joints, ankles, and interphalangeal joints are more often affected (41.0%, 31.3%, 28.9%, respectively) (Table 2, Figure 4).

Table 2. Joint disease incidence in PsA children (n=85)

Affected joints	Absolute number, n	%
Axial skeleton (cervical, thoracic, lumbar spine sections)	6	10,8
Temporomandibular joint	1	1,2
Shoulder joints	6	7,2
Elbow joints	9	10,8
Wrist joints	10	12,1
Small joints of the hands	24	28,9
Hip joints	8	9,6
Knee joints	34	41,0
Ankle joints	26	31,3
Small joints of the feet	15	18,1
Enthesopathies	4	4,8

Figure 2. Joint damage in JpsA

According to our data, the clinical picture of PsA turned out to be variable. In 40 (47%) children, the disease was characterized by high laboratory and clinical activity. Exacerbations of articular and skin syndromes were noted up to 5-6 times a year. In 45 (53%) patients, on the contrary, the process was easy, there was a positive effect from the ongoing anti-rheumatic therapy.

According to the results of the X-ray examination, in the active period of the disease, 40 (45%) patients had the I radiological stage according to Steinbrocker, in 44 (53%) the III-IV radiological stages.

It should be noted that in all patients, periarticular osteoporosis was expressed, which is not characteristic of PsA.

DISCUSSION

Despite the current experience and knowledge in the field of PsA, the etiology and pathogenesis are still largely unclear. Environmental factors, including infection, trauma, stress, only trigger factors in the development of PsA in genetically predisposed people.

So, according to the results of our study in most cases (41%), the potential trigger could not be established. A hereditary predisposition to the development of psoriasis and PsA are noted: it is known that more than 40% of patients have a family history of psoriasis in relatives of the 1st degree of kinship. According to our data, a family history of psoriasis among relatives of the 1st degree of kinship was observed in 26% of children, 2nd degree of kinship - in 41% of children. Girls predominate in the sexual distribution, which is consistent with literature (6, 7, 8). However, two peaks of morbidity at an early age and adolescence described in the literature are not traced by us. In childhood, according to a few studies, in 50% of cases, arthritis precedes the appearance of psoriasis (9, 10). So, according to our data, in 48.0% of children, articular syndrome preceded psoriasis. In children with JPsa, asymmetric oligoarthritis is more often observed at the onset of the disease (9,10,11,12). Among the children we observed in the onset of the disease, asymmetric oligoarthritis was recorded in 69% of children. During the course of the disease, a transformation of the articular syndrome was observed with rheumatoid arthritis prevailing (46.6%). The most common clinical form of psoriasis was plaque psoriasis (71.2%), which is consistent with published data. (13,14,15). Much less often than in the described literature, an isolated lesion of the nail plates was found (5% versus 20-50%) (15). In 40-60% of patients, biomarkers of inflammation (ESR and CRP) remain normal (16). In our study, in 20% of children, the disease proceeded without activity. The X-ray picture in PsA is characterized by features: narrowing of the joint gap, bone remodeling (resorption of terminal phalanges, large eccentric erosion, osteolysis), bone proliferation (marginal bone growths, periostitis, enthesophytes, bone ankylosis), asymmetric bilateral or unilateral spondylitis, paravertebral ossification and marginal syn-desmophytes (17). According to our data, 53% of patients

had the III-IV radiological stages, 47%) patients had the I radiological stage according to Steinbrocker. Periarticular osteoporosis has been described in all children with JPsa, which is not characteristic of JPsa (18).

CONCLUSION

The clinical picture of JPsa is variable. Most patients with JPsa do not have a chronological relationship between skin and joint damage. The most common form of psoriasis is plaque psoriasis. At the onset of the disease, asymmetric oligoarthritis prevails, followed by transformation with a predominance of rheumatoid-like arthritis. Thus, children with JPsa require the joint supervision of a rheumatologist and a dermatologist.

CONFLICT OF INTEREST

None.

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