Juvenile Idiopathic Arthritides Evaluated Prospectively in a Single Center According to the Durban Criteria

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ABSTRACT. ***Objective.*** Chronic arthritis in children represents a nonhomogeneous group of diseases with unknown etiology. To classify these patients in well defined diagnostic categories, a task force of the International League Against Rheumatism proposed a new classification with precise criteria. We analyzed the new criteria in children with chronic arthritis.

Methods. A cohort of children was prospectively and sequentially examined in a pediatric rheumatology clinic from April to June 1997.

Results. One hundred ninety-four children fulfilled the criteria of juvenile idiopathic arthritis and 80% of them (155 children) were classified in one of the 6 diagnostic categories. Seventeen children (9%) did not fit any other category and 22 (11%) could be classified in more than one category. The proportion of children fitting only one category was much lower for psoriatic arthritis and enthesitis related arthritis than for the other categories.

Conclusion. Based on the results, we propose some modifications to the classification criteria. This new classification is an important tool for the diagnosis of chronic arthritis in children, but the criteria need further adjustments to improve the percentage of patients classified in one defined category. (J Rheumatol 2001;28:1083–90)

Key Indexing Terms:
JUVENILE IDIOPATHIC ARTHRITIS CHILDREN CLASSIFICATION
JOINTS DIAGNOSIS

Chronic arthritis in children represents a nonhomogeneous group of diseases whose cause remains unknown. The diagnosis should be made clinically after exclusion of other diseases, such as infections or connective tissue diseases. For 3 decades, the most frequently used classifications have been those of the European League Against Rheumatism (EULAR) and the American Rheumatology Association (ARA), which allowed classification of childhood arthritis into subgroups on the basis of clinical evidence. According to the EULAR classification[1], arthritis lasting more than 3 months before the 16th birthday and after exclusion of any other conditions was called juvenile chronic arthritis (JCA). JCA was classically subdivided into oligoarticular, polyarticular, and systemic arthritis based on symptoms at onset (before 3 months), and included juvenile ankylosing spondylitis, psoriatic arthropathy, and the arthropathies associated with inflammatory bowel disease. A subcommittee of the ARA proposed[2] the diagnostic label juvenile rheumatoid arthritis (JRA) for arthritis of unknown origin persisting for a minimum of 6 weeks with onset under the age of 16. Three onset subtypes were described: systemic, polyarticular, and pauciarticular. Juvenile ankylosing spondylitis, psoriatic arthropathy, and the arthropathies associated with inflammatory bowel disease are excluded from JRA. Both classifications are frequently interchanged although the diagnostic categories are not identical. Further, the criteria used are not well enough defined to allow distribution of patients into homogeneous diagnostic categories. With time, the need became evident for a new classification that could be used worldwide, with well defined and homogeneous diagnostic categories. This new classification would allow better evaluation of the effects of therapies and longterm prognosis. A consensus on classification of arthritides in childhood was the aim of the International League of Associations of Rheumatologists (ILAR) Task Force, which assembled experienced pediatric rheumatologists in Santiago in 1995[3] and in Durban in 1997[4]. The result was a classification of childhood arthritides in 7 different categories.

We assessed these classification criteria in children referred to one pediatric rheumatology clinic between April

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1 and June 30, 1997. Our results underline not only the advantages, but also the pitfalls of such a classification.

MATERIALS AND METHODS

From April to June 1997, consecutive patients presenting at the outpatient clinic for pediatric rheumatology at Hôpital Necker Enfants Malades were enrolled in the study. Patients were required to have arthritis lasting > 6 weeks with followup of at least 6 months' duration. For each patient a questionnaire (Figure 1) was filled out by the examining physician (A-MP, MFH, or RM). The data collected were sex, age at onset and at assessment, family history, and presence of HLA-B27. The rest of the data were analyzed at 2 different times, before and after 6 months of disease duration. The following items were recorded: fever (typical systemic fever as defined or other fever), rash, adenopathy, hepatosplenomegaly, serositis, psoriasis, nail abnormalities, dactylitis, enthesitis, and uveitis (chronic or acute, as defined). The results of antinuclear antibody (ANA) and rheumatoid factor (RF) testing (at least 2 positive results 3 months apart) were also recorded. The presence or absence of arthritis was recorded for each joint, both before and after 6 months of evolution. Data were collected from patients' charts and by questioning the patient and the parents; missing data were obtained from the patients' regular pediatricians; 204 patients were analyzed, but 2 were excluded because of missing data.

Patients were diagnosed as having juvenile idiopathic arthritis (JIA) if another diagnosis could be excluded clinically or by the appropriate laboratory tests by using the classification published recently by Petty, *et al*[4], where 7 diagnostic categories are described. All patients were analyzed for the criteria in order to classify them in one of the diagnostic categories. Data were anonymously entered in a database (Excel).

RESULTS

Between April and July 1997, 202 patients presenting with arthritis with a followup of at least 6 months were seen. There were 138 girls and 64 boys, with a mean age at assessment of 10.2 years (range 2.4 to 19.4), mean age at onset of 5.3 years (0.7–13.8), and mean duration of disease of 4.9 years (0.5–18.3). Eight patients were not considered as JIA: 3 of them were diagnosed as having systemic lupus erythematosus, 3 mixed connective tissue disease, and 2 vasculitis.

In 194 patients, the diagnosis of JIA was established after excluding other causes of arthritis. One hundred fifty-five children (80%) were classified in one of the 6 defined categories, and 39 were classified (20%) as other arthritis. Of the latter, 17 (9%) did not fit any other category and 22 (11%) fit 2 categories. Children with oligoarthritis represented the largest category (68 patients), distributed equally within persistent and extended oligoarthritis (Table 1). Twenty-nine patients had RF negative polyarthritis and 33 had systemic arthritis. The least often diagnosed categories were enthesitis related arthritis (ERA; 13 patients), psoriatic arthritis (PsA; 8 patients), and RF positive polyarthritis (4 patients).

Santiago compared to Durban classification criteria. The distribution of the 194 patients with JIA using the criteria

1997 DURBAN CRITERIA FOR THE IDIOPATHIC ARTHRITIDES IN CHILDHOOD

This form has to be completed for any 100 consecutive patients whose joint involvement has lasted for at least 6 weeks.

Investigating center_____ Physician identification_____ Patient's code number_____ M ☐ F ☐

Date of birth (D,M,Y)_____ Age at onset (Y,M)_____ Age at assessment (Y,M)_____ Ethnic origin_____

Note: the patient must have been followed for at least 6 months

INSTRUCTIONS

1- Please read carefully the proposed Durban criteria in appendix.
2- Tick the one box in Column A (proposed Durban criteria) and/or *only* the one box in Column B for patients whose arthritis lasted for more than 6 weeks fitting with another confirmed diagnosis or with no diagnosis.
3- Tick all boxes in Column C as yes (Y), no (N), or ? (unknown) and circle the side(s) R and/or L.

Column A Durban proposed criteria	Column B Other confirmed diagnosis
- Systemic arthritis ☐	- Syst lupus erythematosus ☐
- Polyarthritis RF positive ☐	- Poly-dermatomyositis ☐
- Polyarthritis RF negative ☐	- Scleroderma ☐
- Oligoarthritis	- Vasculitis ☐
persistent ☐	- FMF ☐
extended ☐	- Behcet ☐
- Enthesitis related arthritis ☐	- CINCA/NOMID ☐
- Psoriatic arthritis ☐	- Synovial dystrophy ☐
- Unclassifiable ☐	- Malignancy ☐
	- Joint infection ☐
- Classifiable in more than one category ☐	- Other (specify) ☐

Column C Descriptors

Joint involvement (persistent arthritis for at least 6 weeks)	At 6 mo Y N ?	After 6 mo Y N ?
Toes	R L	R L
MTP	R L	R L
Tarsus	R L	R L
Subtalal	R L	R L
Ankle	R L	R L
Knee	R L	R L
Hip	R L	R L
DIP	R L	R L
PIP	R L	R L
MCP	R L	R L
Wrist	R L	R L
Elbow	R L	R L
Gleno-humeral	R L	R L
TM	R L	R L
Sterno-clavicular	R L	R L
Cervical spine		
Thoracic spine		
Lumbar spine		
Sacro-iliac	R L	R L

Other descriptors	At 6 mo Y N ?	After 6 mo Y N ?
Systemic fever		
Other fever		
Rash		
Psoriasis		
Nail pitting		
Generalised lymph nodes		
Hepatosplenomegaly		
Serositis		
Dactylitis		
Chronic anterior uveitis		
Acute anterior uveitis		
Enthesitis		
ANA positive		
RF positive		
CRP levels (max)	mg/l	mg/l
HLA B 27 positive		
Family history of psoriasis		
Family history consistent with HLA B27 associated disease		

Comments

HLA typing Class I Class II Class III Other

Figure 1. The questionnaire used to collect data for each patient.

Table 1. Diagnostic categories of the 194 children with arthritis for more than 6 months and JIA.

Diagnostic Categories	Subcategories	Patients, n (%)	Mean Age at Onset, yrs ± SEM	Girl/Boy
Total		194 (100)	5.3 ± 0.71	134/60
Systemic		33 (17)	4.5 ± 0.6	18/15
Oligoarthritis		68 (35)	3.7 ± 0.3	56/12
	Persistent	34	3.9 ± 0.5	26/8
	Extended	34	3.3 ± 0.5	30/4
Polyarthritis (RF –)		29 (15)	5.7 ± 0.8	21/8
Polyarthritis (RF +)		4 (2)	11.6 ± 7.5	3/1
Psoriatic arthritis		8 (4)	4.6 ± 1.4	5/3
Enthesitis related arthritis		13 (7)	8.8 ± 1.2	4/9
Other arthritis		39 (20)	5.9 ± 0.6	27/12
	Fits no other category	17	4.4 ± 0.7	15/2
	Fits more than one category	22	7.1 ± 0.8	12/10

Table 2. Diagnostic categories according to the Santiago and Durban criteria, and the modifications proposed in this article.

Diagnostic Categories	Santiago Criteria		Durban Criteria		Proposed Criteria	
	No. of Patients	Percentage of Category†	No. of Patients	Percentage of Category†	No. of Patients	Percentage of Category†
Systemic	3	9	33	100	33	100
Oligoarthritis	75	86	68	94	71	99
Persistent	38		34		34	
Extended	37		34		37	
Polyarthritis (RF –)	30	48	29	62	30	94
Polyarthritis (RF +)	3	100	4	100	*	
Psoriatic arthritis	7	27	8	44	18	100
Enthesitis related arthritis	2	11	13	52	15	83
RF positive arthritis	*		*		8	100
Probable psoriatic arthritis	*		*		15	100
Other arthritis	*		39		4	
Fits no other category			17		1	
Fits more than one category			22		3	

† Percentage of patients classified in this category among all patients fulfilling the criteria for this category.
* This category does not apply to this classification.

established in Santiago compared to the Durban criteria is shown in Table 2. One hundred twenty children (62%) fit one of the 6 diagnostic categories using the Santiago criteria, and 155 children (80%) using the Durban criteria. Table 2 shows the percentage of patients classified in each category among all patients fulfilling the criteria for this category, including the patients fitting more than one category. For example, in contrast to the Santiago classification, systemic arthritis is an exclusion criterion for all other categories according to the Durban classification. Thus, 33 patients (100%) fulfilling the criteria for systemic arthritis were classified in this category, whereas with the Santiago classification only 3 children (9%) were classified as systemic arthritis and 30 children fit the systemic arthritis category and another category. Further, the revision of the Durban criteria allowed diagnosis of a significantly higher number of patients as ERA (13 patients with the Durban criteria vs 2 patients for the Santiago criteria). In the Santiago classification, positive ANA was an exclusion criterion for ERA, and to be a male over 8 years of age at disease onset was not an inclusion criterion for ERA. Thus, 10 children diagnosed as ERA according to the Durban criteria were not considered as having ERA but oligoarthritis (7 patients) or remained unclassified (3 patients) with the Santiago classification.

Systemic arthritis. Thirty-three patients were classified as systemic arthritis, none of them fitting any other category. Eighteen had polyarticular onset (> 4 joints involved during the 6 first months of disease) and 5 oligoarticular onset and 10 had no arthritis in the first 6 months after symptom onset.

Typical systemic fever, as defined[4], was found in 40 children; 33 of them were described above. The 7 remaining

children had typical systemic fever, but did not have any of the 4 other criteria for systemic arthritis, and thus did not fit this category. One child had an erythematous evanescent rash accompanied by diffuse articular pain, and 3 months later had systemic fever. After the period with systemic features, this boy presented with inflammation of several joints and was classified as RF negative polyarthritis. Five children were classified as extended oligoarthritis (2 patients), persistent oligoarthritis (2), or RF negative polyarthritis (1). Three of these 5 children had positive ANA. One patient had a positive family history for psoriasis and dactylitis fitting the PsA category. This latter child was not excluded from the PsA category, since systemic arthritis is an exclusion criterion for this category and not typical systemic fever.

Oligoarthritis. Sixty-eight children were classified as oligoarthritis. The 2 subcategories, persistent and extended oligoarthritis, were distributed equally, with 34 children fitting each.

Polyarthritis (RF negative). Twenty-nine patients fit the negative RF polyarthritis category.

Polyarthritis (RF positive). Four children with positive RF had polyarticular onset and fit the RF positive polyarthritis category. One of these had a positive family history for psoriasis and dactylitis, but could not be classified as PsA since positive RF is an exclusion criterion for this category.

Psoriatic arthritis. Eight children were classified as PsA, and all had an oligoarticular onset. Twenty-five children fulfilled the criteria for PsA: 8 of them fit the PsA category only and 10 fit more than one category. Seven children were excluded because systemic arthritis (6 patients) and positive RF (1 patient) are exclusion criteria for PsA.

Enthesitis related arthritis. Thirteen children fit the ERA category, and all had an oligoarticular onset. These children had exclusion criteria for oligoarthritis, such as family history for HLA-B27 associated disease (6 patients) and the presence of HLA-B27 in a male over 8 years at onset (7 patients). Thirty-one children fulfilled the inclusion criteria for ERA. Thirteen of them fit the ERA category and 12 fit more than one category. Three children were excluded because systemic arthritis is an exclusion factor for ERA, and 3 patients were classified as PsA since positive family history for psoriasis is an exclusion criterion for ERA.

Other arthritis. The total number of patients in the "other arthritis" category was 39; this includes 17 who did not fit any other category and 22 who fit more than one category.

The latter 22 children were classified (Table 3) as PsA and RF negative polyarthritis (10 patients), ERA and oligoarthritis (4), and ERA and RF negative polyarthritis (8). Ten children were classified as PsA and RF negative polyarthritis. These patients were classified in 2 categories since neither psoriasis nor positive family history for psoriasis is an exclusion criterion for polyarthritis. Nine of these children had a positive family history for psoriasis and dactylitis, and none of them had nail abnormalities. Only 2 of these 10 children (20%) had psoriasis, in contrast to the children fitting only the PsA category, where 50% had psoriasis.

Table 3. Diagnosis of the 22 patients fitting more than one category.

No. of Patients	Diagnostic Category 1	Diagnostic Category 2
10	Psoriatic arthritis	Polyarthritis (RF negative)
8	Enthesitis related arthritis	Polyarthritis (RF negative)
4	Enthesitis related arthritis	Oligoarthritis

Four children were classified as ERA and oligoarthritis. Both the presence of HLA-B27 and the age at onset > 8 years in a male are inclusion criteria for ERA. The same criteria will exclude a patient from the oligoarthritis category only if both are present together. Three of these 4 children were males over 8 years at disease onset and one of them showed the presence of HLA-B27; additionally, these 4 patients had inflammatory spinal pain. As a consequence, these 4 children fit the ERA category and could not be excluded from the oligoarthritis category.

Eight children fit both the ERA and RF negative polyarthritis categories. All the ERA patients with polyarticular onset were classified in both ERA and RF negative polyarthritis, since there are no exclusion criteria in polyarthritis related to ERA inclusion criteria.

To evaluate if the patients classified in 2 categories were more likely to belong to one or the other category, we examined their clinical features. Enthesitis was found in none of the children with ERA and oligoarthritis, and in 3 of the 8 children with ERA and RF negative polyarthritis. In the absence of enthesitis, arthritis has to be associated with 2 out of 5 criteria in order to diagnose ERA[4]. Sacroiliac joint tenderness and/or inflammatory spinal pain is one of these criteria, also if restricted to the neck. Thus cervical arthritis, typically found in patients with systemic arthritis, polyarthritis, or extended oligoarthritis, is considered by the Durban classification as an inclusion criterion for ERA if associated with one of the 4 other criteria. In 3/4 children classified as ERA and oligoarthritis, and in 3/8 children with ERA and RF negative polyarthritis, cervical arthritis was one of the 2 criteria for ERA. In contrast, only 2 of the 13 children classified as ERA showed cervical arthritis as one of the 2 inclusion criteria (Table 4). Patients fitting both ERA and oligoarthritis categories represented the only group where no patient had enthesitis and where the majority of the patients had only 2 criteria for ERA, including cervical arthritis as the only spinal involvement. This latter feature may indicate that these patients are wrongly classified as having ERA. Eight of the 25 patients fitting the ERA category had 2 criteria for ERA including cervical arthritis, and 6 of these 8 children had positive ANA

Table 4. Diagnostic criteria for enthesitis related arthritis (ERA).

Diagnostic Categories	ERA Only, n = 13 (%)	ERA + Oligoarthritis, n = 4 (%)	ERA + Polyarthritis, n = 8 (%)
Enthesitis	6 (46)	0	3 (38)
3 criteria	1 (8)	0	2 (25)
2 criteria	4 (30)	1 (25)	0
2 criteria (includes cervical involvement)	2 (16)	3 (75)	3 (38)
Median age, yrs (range)	9.8 (1.7–13.8)	9 (3.0–11.5)	9.2 (3.5–11.2)
No. patients HLA B27+ (%)	11 (85)	1 (25)	6 (75)
Male/female	10/3	3/1	5/3

Table 5. Clinical characteristics of the 17 children fitting no other category.

No. of Patients	Clinical Features that Led to Exclusion	Diagnosis Excluded
13	Positive family history of psoriasis	Oligoarthritis
	No psoriasis	Psoriatic arthritis
	No dactylitis	
	No nail abnormalities	
2	Positive RF	Oligoarthritis
1	Positive RF	Oligoarthritis
	Positive family history of HLA-B27 related diseases	
	No enthesitis	Enthesitis related arthritis
	Only one criterion:	
	Positive family history of HLA-B27 related diseases	
1	Positive RF	Oligoarthritis
	No enthesitis	Enthesitis related arthritis
	Only one criterion	
	Cervical spine involvement	

and/or chronic uveitis typically found in other JIA categories.

All of the 17 children fitting no other category (Table 5) had an oligoarticular onset and one or more exclusion criteria for oligoarthritis. Thirteen of them had a positive family history for psoriasis, excluding them from the oligoarthritis category, but they did not fit the PsA category, because the positive family history was the only diagnostic criterion for PsA in these children. Four children had a positive RF excluding them from the oligoarthritis category. One of these 4 children had a positive family history for HLA-B27 related diseases and another had cervical spine involvement, but they did not fit the ERA category because of the lack of an additional diagnostic criterion for ERA.

Exclusion criteria. Table 6 shows the effect of the different exclusion criteria used in the Durban classification. In 76 patients (39%), exclusion criteria were used to avoid classification in 2 different categories or indicated that the patient could not be classified. The only exclusion factor for systemic arthritis is the absence of joint involvement, which caused a delay until the final diagnosis was made in 10 patients. Five exclusion criteria are described for oligoarthritis. Because of 2 of these criteria (positive family history for psoriasis and positive RF), 17 children fit the other arthritis category (fits no other category), representing all the patients in this category. Two exclusion criteria (positive family history for HLA-B27 associated disease and male over 8 years with the presence of HLA-B27) allowed patients with oligoarticular onset to be classified as ERA. Without these exclusion factors no patient could have been diagnosed as ERA. Three patients fitting the ERA category were classified as PsA since positive family history for psoriasis is an exclusion factor for ERA. Nine of the 33 patients with systemic arthritis could fit the PsA (6 patients) or the ERA categories (3 patients), but were excluded from these categories because systemic arthritis is an exclusion criterion for them.

The relationship between the 6 diagnostic categories is illustrated in Figure 2 by the overlap of circles representing each category. Systemic arthritis is the only category where patients cannot be classified as well in another category. Patients are never classified as both PsA and ERA because of the exclusion factor illustrated by the arrow. Finally, in contrast to the Santiago classification, by the Durban revised

Table 6. The exclusion criteria.

Category	Exclusion Factor	No. of Patients	Result
Systemic	No joint involvement first 6 months	10	Delay in diagnosis
Oligoarthritis	Positive family history of psoriasis	13	Patients unclassified
		8	Only psoriatic arthritis
Oligoarthritis	Family history of HLA-B27 associated disease	5	Only ERA
Oligoarthritis	RF +	4	Patients unclassified
Oligoarthritis	Male > 8 years HLA-B27 +	8	Only ERA
Oligoarthritis	Systemic arthritis	5	Only systemic arthritis
Positive (RF –)	Systemic arthritis	18	Only systemic arthritis
Psoriatic arthritis	Systemic arthritis	8	Only systemic arthritis
Psoriatic arthritis	RF +	1	Only polyarthritis (RF +)
ERA	Systemic arthritis	3	Only systemic arthritis
ERA	Positive family history of psoriasis	3	Only psoriatic arthritis

ERA: enthesitis related arthritis.

Table 7. Proposed modifications for the Durban criteria.

RF positive arthritis in replacement of RF positive polyarthritis
New labeling for ERA category: inflammatory spinal pain **not limited to the neck**
New exclusive criteria for RF negative polyarthritis category
Enthesitis or sacroiliitis in a boy over 8 years of age
Psoriasis and/or positive family history for psoriasis
New category: probable psoriatic arthritis

criteria patients with polyarticular onset and positive RF could theoretically be classified as both RF positive polyarthritis and ERA. This was never the case among the 194 patients with JIA.

DISCUSSION

The new classification set up in Santiago and revised in Durban is the first attempt to create homogeneous groups of patients defined with criteria recognized worldwide. This article illustrates the difficulty of classifying chronic inflammatory joint disorders in children and adolescents. In our study the vast majority of children presenting with a 6 month followup of arthritis were diagnosed as having JIA, and only 8 children had another diagnosis. This observation suggests that this new classification is able to detect almost all children with JIA. According to the Durban criteria, 80% of them were classified in one diagnostic category, but only 62% were so classified by the Santiago criteria (62%), suggesting that improvement of this classification is possible and may be considered for the revised Durban criteria. Based on these results, we propose modifications of the criteria (Table 7) to decrease the number of patients fitting the category "other arthritis," but without altering the homogeneity of the diagnostic categories.

The "other arthritis" category (Table 1) is constituted by children fitting no other category or fitting more than one

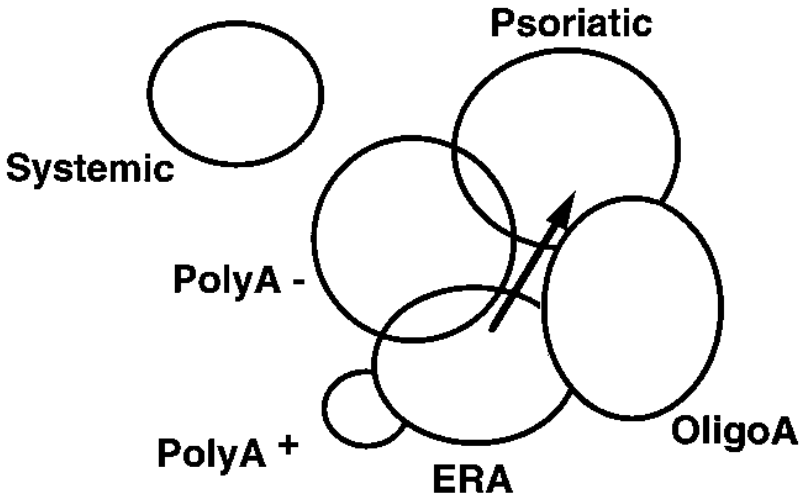

Figure 2. The 6 diagnostic categories for JIA are represented by circles. The overlap between the categories is illustrated: when the borders of 2 adjacent categories are visible, patients could be classified into both categories; when borders are not visible, overlap is theoretically possible but was not seen in our cohort of patients.

category[4]. Four of the children fitting no other category were RF positive and had an oligoarticular onset (Table 5). We suggest redefining the positive RF polyarthritis category so that both oligoarthritis and polyarthritis are combined with positive RF arthritis in the same category. We suspect that in juvenile arthritis positive RF is a marker for early onset RA, regardless of the number of joints involved during the first 6 months of disease. Increased frequency of the HLA class II allele DR4 has been observed in RF positive juvenile arthritis[5], and most likely reflects the relationship with adult RA. Since HLA-DR4 is decreased in oligoarticular juvenile arthritis, it would be important to determine the percentage of RF positive oligoarthritis patients with the DR4 allele[6,7]. Two cases of RF positive oligoarthritis have been reported and HLA-DR4 was absent in both[8]. Since only 60% of the RF positive polyarthritis in JIA showed the presence of HLA-DR4[6], a larger number of patients is needed to determine how to classify patients with RF positive oligoarthritis.

Thirteen children with positive family history of psoriasis who did not fulfill all the criteria for PsA fit the "other arthritis" category. Psoriasis, dactylitis, or nail pitting may occur later during the disease course, and the patients will then be classified as having PsA. As shown by work in juvenile PsA[9], psoriasis can either precede arthritis onset or occur within the next 15 years. Hamilton, *et al*[10] report that after a median followup of 8.8 years, 71% of the children with PsA presented with nail lesions and 39% with dactylitis. Thus, PsA patients may present initially with oligoarthritis or RF negative polyarthritis and have a positive family history for psoriasis as the only diagnostic criterion, since positive family history is found in 73% of patients with PsA[10]. Only later will these patients present typical features of PsA.

To reduce the number of unclassified patients, we could propose removing positive family history for psoriasis from the exclusion criteria of oligoarthritis. This would mean that the many patients who will acquire the clinical features of PsA (psoriasis, dactylitis, or nail pitting) later in the disease course would be initially classified as oligoarthritis, thus impairing the homogeneity of the oligoarthritis category. Further, many children with oligoarticular onset and complete features for PsA would fit the categories for both oligoarthritis and PsA. For these reasons, we believe that a positive family history for psoriasis should remain an exclusion criterion for the oligoarthritis category.

Ten children with PsA fit the category of PsA and RF negative polyarthritis. Two of them had psoriasis and 9 had a positive family history for psoriasis. These features could be considered as exclusion criteria for RF negative polyarthritis, which is likely to increase the homogeneity of this category. In our patients, this change would add 3 children to the category "fits no other category." Indeed, children who will later present with the diagnostic criteria for PsA will no longer be classified as RF negative polyarthritis during the first years of the disease, but they will be initially classified in the category "fits no other category." To avoid this problem, we propose a new diagnostic category, "probable psoriatic arthritis." This would regroup the patients with positive family history for psoriasis, but who do not have an additional diagnostic criterion such as dactylitis or nail pitting. These patients would move to the definite PsA category if later during the evolution of psoriasis they acquire dactylitis and/or nail pitting.

Two exclusion criteria for oligoarthritis are connected to enthesitis related arthritis (positive family history for HLA-B27 related disorders and disease onset before age 8 in a male). With these criteria double classification was avoided in 13 patients and no patient remained unclassified. Among the children fitting more than one category, 6 were classified as having ERA because cervical arthritis is an inclusion criterion for ERA. Based on this observation, we propose modifying this criterion to label it "sacroiliac joint tenderness and/or inflammatory spinal pain not limited to the neck." With this change, 3 patients would fit the polyarthritis and 3 patients the oligoarthritis category, and one ERA patient with oligoarticular onset would fit the category "no other arthritis." Since this last patient has chronic uveitis and positive ANA, exclusion from the ERA definition is likely to increase the homogeneity of this category. As well, we propose adding for the RF negative polyarthritis category the exclusion criterion "enthesitis or sacroiliitis in a boy over 8 years of age at disease onset in the presence of HLA-B27." Thus 3 children with ERA and RF negative polyarthritis would be classified in the ERA category.

As shown in this study, PsA and ERA are the most difficult categories to define correctly. Classically, both categories were considered to be part of the spondyloarthropathy group of diseases[11-13]. The new classification separates them in 2 distinct categories, which should not overlap since positive family history for psoriasis is an exclusion criterion for ERA. Only patients fitting the ERA category and having psoriasis would be classified into both categories. Although it was not the case in our study, we suggest consideration of psoriasis as an exclusion criterion for ERA. The presence of HLA-B27 in patients with PsA has been reported in adults but not in children, according to Hamilton, *et al*[10], whereas in a study of 60 patients Shore and Ansell reported the presence of HLA-B27 in 8 children, 5 of whom had radiological sacroiliitis[9]. In patients with PsA, HLA-B27 may be a marker for a different course of disease, in particular spinal involvement[14], that is not considered by the actual classification.

Systemic arthritis did not overlap with any other category because systemic arthritis is an exclusion criterion for the other categories. Classically, systemic features allowed clinicians to distinguish systemic arthritis from oligoarthritis and polyarthritis. None of our patients who fit the systemic

arthritis category presented with enthesitis or spinal involvement except for cervical arthritis, and the 3 patients excluded from ERA because of systemic arthritis had cervical arthritis as a criterion for ERA. PsA was excluded in 6 patients with systemic arthritis and 2 of them had psoriasis. Typical systemic fever and maculopapular rash are not reported in the classical description of juvenile PsA[15,16]. For this reason, these 6 patients would belong to the systemic arthritis rather than the PsA category.

According to the proposed modifications (Table 7), 175 patients (90%) would be classified in one of the 6 diagnostic categories, one (0.5%) would remain unclassified, 4 (2%) would fit more than one category, and 15 patients (8%) would fit the probable PsA category (Table 2). An ideal classification for chronic inflammatory joint disorders in children would be based on etiology, which remains unknown. The attempt to improve our clinical tools for diagnosis of chronic arthritis in children with this new classification will certainly help the pediatric rheumatologist with research and management of these diseases. However, this important improvement should not hide the real challenge, which is to find the etiology or etiologies for idiopathic arthritis in childhood.

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