Rheumatol Int (1984) 4:67–73

Rheumatology
INTERNATIONAL
Clinical and Experimental Investigations

Psoriasis and arthritis

III. A cross-sectional comparative study of patients with "psoriatic arthritis" and seronegative and seropositive polyarthritis: radiological and HLA aspects

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Received June 1, 1983 / Accepted November 1, 1983

Summary. In a group of patients with seronegative polyarthritis and psoriasis, the radiological features and the incidence of histocompatibility antigens were compared with those of a group of patients with seronegative polyarthritis but not psoriasis. No radiological criteria proved to be characteristic of psoriatic arthritis. In the group of patients with seronegative polyarthritis and psoriasis, erosions of the distal interphalangeal (DIP) joints were seen more frequently and were more severe than in the group of patients with seronegative arthritis without psoriasis. For the group of patients with seronegative polyarthritis and psoriasis, correlation was found between psoriatic nail lesions and erosions of the DIP joints, but this correlation was not found between the nail involvement and erosion of the adjacent DIP joint. No significant differences were found for the incidence of histocompatibility antigens between patients with seronegative polyarthritis with or without psoriasis. However, differences were found between these two groups and either the seropositive polyarthritis group or blood bank donors.

Key words: Psoriatic arthritis – Psoriasis – Seronegative polyarthritis – Radiology – Genetic factors

Introduction

In the preceding reports [1, 2] the epidemiological and clinical findings in patients with seronegative polyarthritis with psoriasis, seronegative polyarthritis without psoriasis, and in patients with seropositive polyarthritis were presented. Differences were found between the frequency in which the terminal joints of fingers and toes were affected in patients with seronegative arthritis with or without psoriasis [2, 3]. Furthermore, a relationship between arthritis of the terminal joints and nail psoriasis observed by others [3, 4] was confirmed. However, statistical analysis comparing these features in a group of patients with seronegative arthritis and psoriasis and a group with seronegative arthritis without psoriasis showed that these parameters were not sufficiently different to set the psoriatic group apart as a separate entity, a conclusion which was also reached for asymmetry of joint involvement [2].

Radiological observations in patients with psoriatic arthritis were first described extensively by Langlois [5], who concluded that radiological abnormalities varied widely among patients with psoriatic arthritis. Avila et al. [6] contested Langlois' results and described five radiological phenomena more or less specific for psoriatic arthritis. In the present study, we found only minor radiological differences between patients with psoriatic arthritis and patients with seronegative arthritis without psoriasis. In line with our epidemiological and clinical studies [1, 2] the radiological findings did not differ sufficiently to discriminate statistically between patients with psoriatic arthritis and patients with seronegative arthritis without psoriasis.

In recent years, correlation between psoriatic arthritis and certain genetic markers present in patients with this disease has been reported [7–9]. However, in all these studies patients with psoriatic arthritis were compared with either patients with only psoriasis or with blood donors. To avoid this drawback, we determined the frequencies of a panel of HLA antigens in patients with seronegative arthritis and psoriasis and compared them with those in two groups of patients, one with seronegative arthritis without psoriasis and the other with seropositive arthritis.

Materials and methods

Patients. Three groups of patients were selected according to the criteria described in the preceding article [2]. In brief, the first group comprised 92 patients with seronegative polyarthritis (group S–P+), the second 72 patients with only seronegative polyarthritis (group S–P–), and the third 46 patients with seropositive polyarthritis (group S+P–). For comparative studies on the prevalence of HLA antigens, each of these three groups was compared with a panel of 5 000 bloodbank donors.

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Radiographs. Radiographs were made of the hands, feet, cervical spine, and pelvis on the same day as the clinical examination was performed. The cervical spine was X-rayed in maximal ante- and retroflexion. Radiographs of the hands and feet were made on no-screen films in stereo by changing the position of the camera. Reading of these stereoscopic photos was facilitated by the use of a cartographic stereoscope.

The films were read blind by two investigators. For erosion and joint narrowing, a five-point scale was used (0=absent, 1=doubtful, 2=mild, 3=moderate, 4=severe); for the items "syndesmophytes", "mutilans", "wittling or osteolysis" and "spicae", a two-point scale (0=absent, 1=present) was used. If the scores differed by two points or more on the five point scale or by one point on the two-point scale, the radiographs were re-examined and mean value was agreed upon. As radiological reference, the atlas of Kellgren et al. [10] was used. Erosion of the cervical spine was defined as discus narrowing with irregular bone-plate surface without signs of osteophytes or erosions of the intervertebral joints. If radiographs were not interpretable (e.g. because of faulty choice of exposure), the cases were scored as "missing". The interpretation of radiographs of the pelvis of very obese persons was sometimes so difficult that we classified them too as "missing".

For groups of joints, each joint was examined separately. To reduce the amount of data obtained from the various joint groups, the arithmetic mean and the maximum of the parameter in question was computed. Theoretically, the maximum score can differ significantly in the presence of the same mean. Since analysis based on the maximum scores showed almost the same patterns as those based on the mean, only mean values will be reported.

Typing for histocompatibility antigens (HLA). HLA typing was performed for 8 and 15 alleles on the A and B loci respectively. Possible differences between groups S–P+ and S–P– and between groups S–P+ and S+P– were evaluated by the χ^2-test, and the data were compared with the typing results of 5 000 blood bank donors. The P value was corrected according to Edwards [11].

Computer and statistical aspects. All items were recorded on mark-sensing forms. The information was checked twice: the mark-sensing forms were checked for illegal information before the information was added to the patient's record. When all patient's forms had been completed, the record was checked for errors (cross-checks).

For the calculation of differences between groups Student's t-test was mainly used. Other statistical tests applied where appropriate are mentioned in the text. Because of the large number of parameters analysed, differences were considered to be significant when the P value was smaller than 0.015 [12, 13]. For statistical analysis, the SPSS computer program was applied [14].

Results

For all three groups of patients, the number of eroded joints of each hand and foot was counted in each individual (Fig. 1). Only for the right foot was a significant difference (Yates Cochran: $P=0.008$) found in this respect, i.e. between group S–P+ and group S–P–. For the number of eroded joints of the left foot and the hands the P values were respectively 0.173, 0.030 and 0.052. The hand and foot joints were more severely affected in group S+P– than in group S–P+. The P values for the right and left hand were 0.04 and 0.018 respectively, and for the right and left feet 0.019 and 0.021 respectively. When the terminal joints of the hands and feet, which are considered

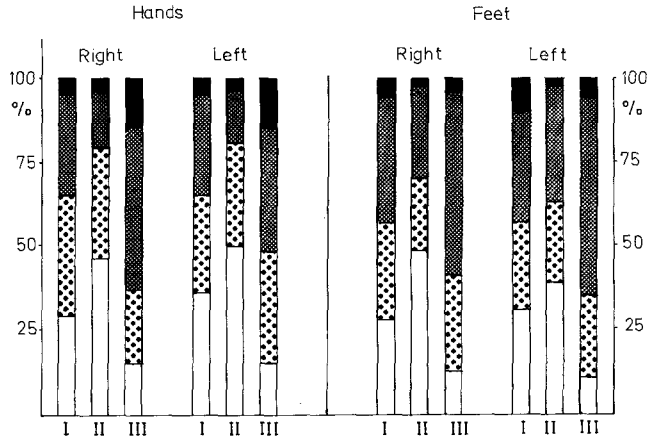

Fig. 1. Proportional distribution of the number of patients in each group without eroded joints (*white*); with one or two eroded joints (*coarse stippling*); with three to eight eroded joints (*fine stippling*) or with 9–15 eroded joints (*black*) for the right and left hands (*left panel*) and the right and left toes (*right panel*). Group I comprises patients with a seronegative polyarthritis with psoriasis, group II patients with seronegative polyarthritis without psoriasis and group III patients with seropositive polyarthritis

to be the most characteristic of psoriatic arthritis, were excluded from the calculations, group S–P+ closely resembled group S–P– as to the number of affected joints. For comparison of erosion and narrowing of individual joints or groups of joints, the mean scores for joint erosion are given in Table 1 and the mean scores for joint narrowing in Table 2.

Group S–P+ versus group S–P–

With respect to joint erosions significant differences were only found between the proximal interphalangeal (PIP) and distal interphalangeal (DIP) joints of the feet (Table 1). These joints were more severely affected in group S–P+ than in group S–P–. With respect to joint narrowing, only the PIP joints of the left toes and the DIP joints of the right toes were affected significantly more often in group S–P+ compared to group S–P–. In contrast, the metatarsophalangeal (MTP) joints of the left feet were narrowed significantly more severely in group S–P–. Mutilated joints were relatively rare in both groups. In group S–P+ 18.9% of the patients had one or more mutilated joints as judged from the radiographs. In group S–P– this percentage was 12.7. The difference was far from significant.

Whittling too was rarely seen in both groups. In group S–P+ this phenomenon was observed in the right foot of 5% of the patients and in group S–P– in the left foot of 1% of the patients. For the fingers these percentages were even lower in both groups. Low percentages were also found for spicae at the base of end-phalanges of the big toes. In group S–P+ spicae were observed in 9% of the patients in the right foot and in 8% in the left foot. In group S–P–, this phenomenon was found in 3% of the patients in both feet.

Table 1. Mean score or erosions of individual joints or groups of joints in patients with psoriatic arthritis (S–P+), seronegative arthritis without psoriasis (S–P–), or seropositive arthritis (S+P–). *R* right; *L* left

Joints		Patient groups			*P* values	
		S–P+	S–P–	S+P–	S–P+ ↔ S–P–	S–P+ ↔ S+P–
Cervical spine (x)		0.128	0.059	0.014	0.321	0.071
Wrist	(R)	1.230	1.086	2.130	0.506	0.001**
	(L)	1.103	0.971	2.283	0.528	0.000**
Hands						
MCP	(R)	0.680	0.454	1.178	0.113	0.018
	(L)	0.618	0.411	1.155	0.135	0.014**
PIP	(R)	0.360	0.321	0.908	0.725	0.001**
	(L)	0.330	0.279	0.663	0.669	0.022
DIP	(R)	0.368	0.157	0.313	0.020	0.595
	(L)	0.336	0.156	0.222	0.056	0.205
Hip	(R)	0.129	0.314	0.129	0.160	0.196
	(L)	0.129	0.250	0.283	0.303	0.237
SI	(R)	0.563	0.614	0.674	0.738	0.500
	(L)	0.575	0.500	0.543	0.626	0.839
Feet						
MTP	(R)	0.805	0.851	1.604	0.788	0.000**
	(L)	0.879	1.003	1.737	0.484	0.000**
PIP	(R)	0.506	0.208	0.304	0.012*	0.210
	(L)	0.567	0.169	0.346	0.001*	0.206
DIP	(R)	0.552	0.123	0.252	0.000*	0.003*
	(L)	0.573	0.163	0.272	0.000*	0.011*

Values are significantly ($P < 0.015$) increased (*) or reduced (**) in group S–P+ compared to either group S–P– or S+P–

Table 2. Mean score of joint narrowing of individual joints or groups of joints in patients with psoriatic arthritis (S–P+), seronegative arthritis without psoriasis (S–P–), or seropositive arthritis (S+P–). *R* right; *L* left

Joints		Patient groups			*P* values	
		S–P+	S–P–	S+P–	S–P+ ↔ S–P–	S–P+ ↔ S+P–
Wrist	(R)	0.870	1.194	1.652	0.153	0.004**
	(L)	0.652	1.125	1.826	0.033	0.000**
Hands						
MCP	(R)	0.200	0.183	0.330	0.832	0.181
	(L)	0.148	0.169	0.270	0.770	0.150
PIP	(R)	0.215	0.285	0.511	0.522	0.030
	(L)	0.177	0.271	0.456	0.097	0.013**
DIP	(R)	0.178	0.081	0.117	0.097	0.383
	(L)	0.135	0.097	0.061	0.535	0.231
SI	(R)	1.185	1.408	0.932	0.262	0.282
	(L)	1.174	1.319	1.065	0.447	0.627
Feet						
MTP	(R)	0.108	0.253	0.383	0.043	0.020
	(L)	0.072	0.247	0.408	0.015**	0.002**
PIP	(R)	0.366	0.153	0.196	0.045	0.200
	(L)	0.423	0.066	0.250	0.000*	0.270
DIP	(R)	0.609	0.361	0.287	0.011*	0.001*
	(L)	0.613	0.433	0.265	0.044	0.000*

Values are significantly ($P < 0.015$) increased (*) or reduced (**) in group S–P+ relative to either group S–P– or group S+P–

To find out whether it was possible to distinguish between patients in either group S–P+ or group S–P– on the basis of the radiographs of hands and feet, a discriminant analysis was performed on the radiological data of hands and feet. With the use of two criteria – the maximum score for erosion of DIP, PIP and metacarpophalangeal (MCP) joints and the mean score of mutilans of these joints – only 52% of the patients of group S–P+ were classified correctly as belonging to this group, whereas 86% of the patients of group S–P– were correctly classified according to the X-ray examinations of the hands and feet.

Group S–P+ versus group S+P–

In general, the joints of patients in group S+P– were affected more frequently and more severely than those of group S–P+ (Tables 1 and 2). Significant differences were found for erosions of the wrists, the MCP joints of the left hand, the PIP joints of the right hand, and the MTP joints of both feet. Joint narrowing was observed significantly more often in group S+P– for the wrists, the PIP joints of the left hand, and the MTP joints of the left foot. In contrast, a significantly higher score was obtained for the DIP joints of the feet of patients in group S–P+, for both erosion and joint narrowing. Mutilated joints were found in 13% of the patients of group S+P– and whittling was observed in 4% of the feet of patients in this group. Spicae were not observed in group S+P–.

Nail psoriasis

To evaluate the influence of nail psoriasis the radiological results of the 30 patients in group S–P+ without nail psoriasis were compared with those of the 62 patients with nail psoriasis (Table 3). The mean scores for erosion of the DIP joints of hands and feet were significantly higher in the subgroup with nail psoriasis.

A relationship was also found between the number of mutilated joints and the presence of nail psoriasis. Mutilated joints were present in 7% of the patients in group S–P+ without nail psoriasis and in 24% of those with nail psoriasis. However this difference was not significant according to the criteria used (Yates Cochran; $P=0.044$).

Whittling was only found in the subgroup with nail psoriasis. Spicae were found in both subgroups and did not differ significantly between them.

Nail psoriasis and DIP erosions

Although an over-all relationship was found between the presence of nail psoriasis and the presence of eroded DIP joints of hands and feet, no relationship was found between nail psoriasis of a particular finger or toe and erosion of the adjacent DIP joint. The correlation coefficient computed for nail psoriasis of a finger or toe and the involvement of the related DIP joints ranged from –0.03 to +0.37.

Table 3. Mean score of joint erosions of individual joints or groups of joints in patients with psoriatic arthritis with and without nail lesions. *R* right; *L* left

		With nail lesions ($n=62$)	Without nail lesions ($n=30$)	*P* value
Cervical spine		0.168	0.047	0.221
Wrist	(R)	1.414	0.862	0.067
	(L)	1.293	0.724	0.051
Hands				
MCP	(R)	0.745	0.552	0.327
	(L)	0.672	0.510	0.406
PIP	(R)	0.434	0.215	0.035
	(L)	0.414	0.164	0.082
DIP	(R)	0.486	0.131	0.002*
	(L)	0.442	0.124	0.005*
Hip	(R)	0.143	0.103	0.726
	(L)	0.125	0.138	0.916
SI	(R)	0.655	0.379	0.197
	(L)	0.724	0.276	0.022
Feet				
MTP	(R)	0.803	0.807	0.987
	(L)	0.934	0.764	0.488
PIP	(R)	0.655	0.196	0.006*
	(L)	0.711	0.268	0.017
DIP	(R)	0.738	0.179	0.000*
	(L)	0.724	0.233	0.002*

* Values differ significantly ($P<0.015$)

Table 4. Results of typing for histocompatibility antigens in patients with psoriatic arthritis (S–P+), with seronegative arthritis without psoriasis (S–P–), with seropositive arthritis (S+P–), and in 5000 blood bank donors (D), expressed in percentages

Antigens	Patients			
	S–P+	S–P–	S+P–	D
HLA–A1	32.3*	24.3	26.1	15.7
A2	36.8	44.3*	73.9*	26.0
A3	17.2	20.0	34.8*	13.9
A9	13.8	28.6*	13.0	8.7
A10	10.4	8.6	4.4	3.7
A11	14.9*	10.0	10.9	5.2
Aw19	19.5	32.9*	10.7	11.4
A28	5.1	7.1	6.5	4.3
HLA–B5	11.5	18.6	10.9	10.9
B7	21.8	22.9	10.9	28.1
B8	17.2	17.1	30.4	23.1
B12	9.2	27.1	21.7	24.0
B13	17.2*	5.7	6.5	4.9
B14	0.0	2.9	4.4	3.8
B15	16.1	14.3	30.4	15.6
Bw16	18.4*	8.6	0.0	6.8
Bw17	17.2*	5.7	0.0	7.7
B18	5.8	2.9	4.4	6.5
Bw21	3.5	1.4	2.2	2.6
Bw22	5.8	8.6	2.2	5.1
B27	20.7*	22.9*	6.5	7.9
Bw35	5.8	12.9	23.9	17.0
B40	9.2	14.3	19.6	18.1

* Values differ significantly from those of blood bank donors (D) for $\chi^2 \geqq 10$ after Edward's *P* correction

An attempt was made to calculate the contribution of various clinical features of nail disease to the presence of erosions of the same finger or toe by means of multiple regression analysis. These features were: pitting, onycholysis, discoloration, hyperkeratosis, and erosion of the nail-plate. No particular pattern of psoriatic features of the nails seemed to be associated with erosion of the adjacent DIP joint.

Prevalence of HLA antigens

The occurence of eight HLA-A antigens and 15 HLA-B antigens are given in Table 4 for the three groups of patients. None of the antigens predominated in any of the three groups of patients. However, comparison of the results in each group of patients with the results of typing in 5 000 blood bank donors (Table 4) showed that HLA-A1, A11, B13, Bw16, B17 and B27 occurred more often in group S–P+, whereas HLA-A2, A9, Aw19 and B27 were more frequent in group S–P–. In group S+P– none of the B antigens predominated relative to the donor panel.

DIP erosions, sacroiliitis and HLA-B27

Of 81 of the 92 patients in group S–P+ the results of both HLA typing and radiography were available. Ten of these 81 patients showed bilateral sacroiliitis, and all of them also had erosions of the terminal joints of the hands or toes. Analysis confirmed a relationship between sacroiliitis and DIP erosions (Fisher's exact test, $P=0.013$). Only two of the ten patients with sacroiliitis appeared to have the HLA-B27 antigen, whereas this antigen was present in 17 of the 81 patients in group S–P+. Nail psoriasis was seen in eight of the ten patients with sacroiliitis. No relationship was found between HLA-B27 and either nail psoriasis or sacroiliitis. In group S–P–, 4 out of 16 patients with HLA-B27 had sacroiliitis on both sides, as did two out of 52 patients without HLA-B27. For group S–P–, a weak relationship was observed between HLA-B27 and sacroiliitis (Fisher's exact test, $P=0.048$).

Discussion

The radiological results obtained in the three groups of patients show that only the terminal joints of the feet were affected significantly more often in group S–P+ than in group S–P–, but discriminant analysis indicated that it is impossible to assign a patient to the psoriatic arthritis group on the basis of the radiological findings in hands and feet. However, on the basis of the radiological data a fairly good prediction can be made for the classification of patients with seronegative arthritis without psoriasis. This may indicate that in the former patients the radiological abnormalities show a more heterogeneous picture. This would be in agreement with the early report of Langlois [5], who concluded that in psoriatic arthritis the radiological abnormalities are highly inconsistent. Wright [15] divided psoriatic arthritis into three subgroups, according to the pattern of arthritis. Although this yielded three roughly homogenous groups of patients, it is obvious that selection processes must have been involved. Thus the classification proposed by Wright [15] could simply be a reflection of the heterogeneity of psoriatic arthritis.

Avila et al. [6] proposed five criteria as more or less specific of psoriatic arthritis, but he too had to admit that these criteria are difficult to apply in an early stage of the disease. Moreover, the radiological abnormalities proposed by Avila et al. [6] as specific for psoriatic arthritis proved to be very difficult to distinguish from those of rheumatoid arthritis when scored in the end-stage of psoriatic arthritis. Nonetheless, many radiologists use these criteria in a more dogmatic sense than they were intended to be used. The first criterion of Avila et al. [6] was destructive arthritis mainly expressed in the DIP joints of the hands and the interphalangeal joints of the toes. Indeed, with discriminant analysis, erosions and mutilation of the DIP and PIP joints are the best criteria to distinguish between patients in groups S–P+ and S–P–, but even when the MCP and MTP joints are included in this analysis, only 50% of the patients can be classified as having psoriatic arthritis.

Ankylosis of the PIP joints and severe destruction of the joints combined with a very wide joint space are two other criteria mentioned by Avila et al. [6]. Analysis of our data indicated that neither of these phenomena was characteristic of either group of patients. Wright [15] did not find ankylosis to be specific for patients with psoriatic arthritis either.

Desctruction of the interphalangeal joint of the great toe with bony proliferation at the base of the end-phalanx and resorption of the end-phalanges, Avila et al's [6] fourth and fifth criteria, were both extremely rare in the groups we studied. Other features mentioned as characteristic of psoriatic arthritis, for example pencil-pointing and cupping [15] are seen in the end stage of both psoriatic arthritis and rheumatoid arthritis, and these features also occur in a number of other rheumatic diseases [16]. Schacherl and Schilling [17] introduced the presence of arthritis in two or more joints in the same finger as a criterion for psoriatic arthritis. Our study, however, failed to show any relationship at all between DIP erosions and PIP or MCP erosions in the same finger. In sum, none of the criteria described in the literature [3, 6, 15] proved to be characteristic of psoriatic arthritis, especially when a group of patients with this disease was compared with a group of patients with seronegative arthritis without psoriasis.

Erosive changes of the terminal joints of fingers and toes are found more frequently in arthritis patients with nail psoriasis than in arthritis patients with psoriasis restricted to the skin (Table 3). In general, nail involvement in psoriatic arthritis seems to be associated with a more severe form of erosive arthritis. Comparison of the group of patients without nail lesions in Table 3 with groups S–P+ and S–P– in Table 1, shows that almost all of the differences between groups S–P– and S–P+ in

Table 1 arise from patients with psoriatic arthritis with nail involvement. This seems to favour a common aetiology of psoriasis with nail involvement and arthritis, but in the population study [1] nail psoriasis combined with arthritic features was only found in 2 out of 41 respondents with psoriasis, and in two comparable cases the nails were not involved. A second argument against a common aetiology of nail psoriasis and arthritis is the absence of a concurrence between the involvement of a particular nail in psoriasis and erosion of the adjacent DIP joint, which indicates that nail psoriasis and erosions of the terminal joints are not related. The observed high incidence of nail psoriasis and DIP joint erosions might be explained by a patient-selection mechanism, since nail involvement in psoriasis accompanied by a severe form of arthritis will lead to a higher rate of referral of this category of patients to the hospital. This supposition is substantiated by the observation that in both groups S–P– and S+P–, DIP involvement is accompanied by a more severe form of erosive arthritis in the other joints, too. When we compared the patients with and without radiological abnormalities of the DIP joints in groups S–P– and S+P–, we found that of the 15 joints examined in the group S–P–, 9 had P values < 0.05 and in the S+P– group, 7 out of 15. Thus the presence of DIP erosions points to a more severe course of the disease.

Whether genetic factors predispose to seronegative polyarthritis with or without psoriasis is still a controversial question [18–21]. In patients with psoriasis alone, HLA-B13 and B17 are reported to predominate [8, 22], but according to the latter authors both antigens are found less frequently in patients with psoriatic arthritis than in those with psoriasis alone. Therefore, it seems unlikely that these antigens predispose for psoriatic arthritis. In our study the frequency of HLA-Bw16 was also higher in patients with seronegative polyarthritis with psoriasis than in the blood bank donors (Table 4). Antisera for HLA-Bw16 have been shown to recognize HLA-B38 and B39. HLA-B38 is reported to occur more frequently in patients with psoriatic arthritis [7, 8, 23, 24]. All of these studies showed a higher prevalence of HLA-B38 in patients with psoriatic arthritis compared with both controls and patients with psoriasis alone, but none of these studies compared psoriatic arthritis patients with patients with seronegative polyarthritis without psoriasis. Although a direct comparison cannot be made because we were unable to demonstrate HLA-B38, the results of the typing for HLA-Bw16 show that this antigen does not differentiate between psoriatic arthritis patients and patients with seronegative polyarthritis without psoriasis. HLA-B27 did not differentiate between patients with seronegative polyarthritis with or without psoriasis either, but this antigen occurred significantly more often in both groups of patients, compared with patients with a seropositive polyarthritis and blood bank donors. This indicates that HLA-B27 predisposes to seronegative polarthritis, although less strongly than to ankylosing spondylitis. Within this group other clinical features too showed correlation with the antigen, e.g. sausage toes, which have been considered characteristic for psoriatic arthritis, but occur in seronegative polyarthritis as well [25].

General conclusions

The group of patients with seronegative polyarthritis has long been the subject of a discussion based on a mixture of hypotheses and facts, mainly because of the large number and diversity of the clinical, serological and radiological manifestations. Some of the features shared by a subgroup of seronegative patients are now recognized as being parameters of a separate disease entity, such as ankylosing spondylitis and Reiter's syndrome or reactive arthritis. The object of the present studies on the epidemiological, clinical and radiological features of patients with seronegative polyarthritis and psoriasis was to establish whether or not sufficient data can be obtained to justify the statement that "psoriatic arthritis" too is an independent entity. Since the total group of seronegative polyarthritis patients are distinguishable from the group of patients with seropositive polyarthritis by several features [26], it is clear that the patients with seronegative polyarthritis with psoriasis can easily be distinguished from the seropositive polyarthritis group. For recognition as a separate disease entity, psoriatic arthritis would have to be marked by distinct features which are absent or much less frequent in patients with seronegative polyarthritis without psoriasis. This means that there must be either clinical, serological or radiological parmeters that make it possible to conclude with a fair level of confidence that a particular patient is suffering from psoriatic arthritis. In the studies presented here, no such parameter was found, whether epidemiologically, serologically, clinically or radiologically. However, some features proved to be more severe in patients with seronegative polyarthritis and psoriasis, such as erosion of the DIP joints. The frequency of this feature showed positive correlation with the involvement of the nails in the psoriatic process when determined for the total group of psoriatic arthritis patients, but not for each individual patient. Thus, both of these phenomena seem to be indicators of the severity of either the arthritis or the psoriasis rather than selective criteria for psoriatic arthritis.

Histocompatibility antigens do not discriminate either with respect to psoriatic arthritis within the group of seronegative polyarthritis patients. Ten (12%) of our patients had an asymptomatic (radiologic) sacroiliitis of which only two (20%) were HLA-B27 positive. The occurrence of sacroiliitis did not significantly differ in the three groups studied. In inflammatory bowel disease a similar discordance of sacroiliitis and HLA-B27 has been found [27], also in a Dutch population study only 5 out of 14 people with sacroiliitis over the age of 44 years were HLA-B27 positive [28]. Asymptomatic sacroiliitis seems to be a radiological feature of seronegative polyarthritis, whether or not it is associated with other diseases like psoriasis or inflammatory bowel disease. Like inflammatory bowel

disease [29] among the group of patients with psoriasis only a minor number (less than 3%) is suffering from ankylosing spondylitis. In these patient groups HLA-B27 is present in about 80%. We might assume that HLA-B27 in these cases is a marker for ankylosing spondylitis and it is not directly related to psoriasis.

HLA-B13 and B17 proved to predominate in patients with psoriasis alone, and therefore the increased frequency of these antigens in psoriatic arthritis patients must be attributed to psoriasis. In our cases the frequency of HLA-Bw16 was significantly increased in patients with seronegative polyarthritis compared with the donor group but was not significantly increased when compared with patients with seronegative polyarthritis without psoriasis. Unfortunately, the incidence of HLA-B38, which is known to be increased in patients with seronegative polyarthritis combined with psoriasis [8, 9] was not compared with a group of patients with seronegative polyarthritis without psoriasis.

The results obtained in this and the two preceding studies do not suggest either that psoriasis can cause seronegative polyarthritis or that a seronegative polyarthritis can cause psoriasis. However, it is clear from these studies that whenever a patient suffers from both seronegative polyarthritis and psoriasis, both diseases tend to be more severe but in our opinion this observation does not validate the hypothesis that either of the two diseases can directly enhance the other. It seems likely that the development of one of these diseases causes a change in, for instance, certain immunological, or biochemical processes, which leads to an increase of severity when the other develops in the same patient. So far, we can only conclude that seronegative polyarthritis and psoriasis might be associated diseases; it is too early to consider the combination as a separative entity when it occurs in the same person.

Acknowledgement. This study was supported by the Netherlands League against Rheumatism.

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