

CONCISE REPORT

Prevalence of spondyloarthritis in Terceira, Azores: a population based study

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Objective: To determine the prevalence of spondyloarthritis (SpA) in the Caucasian population of Terceira Island, Azores.

Methods: Study subjects were recruited from people over the age of 50 years from one half of the island of Terceira (n=24 561). Seventy eight men and 78 women from each five year age group were selected, giving a total of 468 men and 468 women available for study, of whom 490 agreed to take part. These subjects were assessed by dorsal, lumbar, and pelvic radiography. Radiological sacroiliitis was identified in eight patients on whom sacroiliac computed tomography scans were performed. HLA class I typing by polymerase chain reaction with sequence-specific primers was carried out in seven cases.

Results: SpA was present in eight subjects (1.6%, 95% CI 0.8 to 2.7%), including seven men (2.7%) and one woman (0.4%). Three (1.2%) male patients with definite ankylosing spondylitis were HLA-B27 positive. Only one person had a previous diagnosis of SpA.

Conclusion: These data complement previous studies in European countries on SpA prevalence and establish an estimate of the overall prevalence of SpA in a southern European population.

Ankylosing spondylitis (AS) is a chronic inflammatory disease affecting mainly the sacroiliac joints and spine, but other diseases including psoriatic arthropathy, reactive arthritis, the arthritis of chronic inflammatory bowel disease (IBD), and undifferentiated spondyloarthritis also affect these joints. This group of diseases has the designation spondyloarthritis (SpA).¹

The prevalence of AS reported by different studies has varied according to the study design and diagnostic criteria employed. Hospital based studies have reported a low prevalence of AS of between 0.1% and 0.2%.² Population studies have reported different prevalences according to the geographic location and ethnic groups studied. A higher prevalence of AS was found in a population survey of male Haida Indians of Canada (4.3%).³ In Europe the prevalence has varied from 0.23% to 1.8%,² and no data are available from southern European populations.

The prevalence of SpA has not been widely studied in white subjects; a study in Eskimo populations applying the European Spondylarthritis Study Group criteria (ESSG),⁴ reported a figure of 2.5%, with a high frequency of HLA-B27 (25–30%) in controls.⁵ In a recent study in a German population the prevalence of SpA was 1.9%, with a background HLA-B27 frequency of 9.3%.⁶

Because of the current uncertainty as to the true prevalence of AS and SpA in white populations, we sought to determine the prevalence of spondyloarthritis of this condition in the Caucasian population of Terceira Island, Azores, Portugal.

METHODS

Terceira is one of the islands of the Azores archipelago. The island is divided into two municipalities (Angra do Heroísmo and Praia da Victória), each serviced by a single health centre. The population of the municipality of Angra do Heroísmo (35 270 people, of whom 9899 are 50 years of age and older) recently participated in an osteoporosis survey.⁷ In the health centre of Angra do Heroísmo, where the population for this study was selected in 1994, 24 561 people were registered. For the current study, men and women over 50 divided by age groups as follows: 50–54, 55–59, 60–64, 65–69, 70–74, and 75 or over, were randomly selected. Information was obtained from the files of 4509 subjects (1756 men, 2753 women). Those born in mainland Portugal, other islands, or other countries were excluded.

From the 4509 subjects who took part in the osteoporosis survey, 936 people were randomly selected for the current study, including 78 men and 78 women in each age group (468 men and 468 women). These people were invited by letter to attend the health centre for an interview and a dorsal and lumbar lateral x ray examination. Anteroposterior dorsal, lumbar, and pelvic x ray examinations were added to study the radiological prevalence of spondyloarthritis. The x ray findings were read blindly by two observers (JB and CL), and 65 subjects with possible sacroiliitis had sacroiliac computed tomographic (CT) scans. Informed consent to perform x ray examinations and CT scans was obtained. Patients with sacroiliitis (both on plain radiographs and sacroiliac CT scans) were clinically examined and blood was collected for HLA class I typing. SpA was diagnosed according to the ESSG criteria,⁴ and AS by the modified New York criteria⁸; seven patients were studied for HLA class I by polymerase chain reaction with sequence-specific primers (PCR-SSP) as published,⁹ and one patient was tested only for HLA-B27 by flow cytometry (FACS Calibur, Becton Dickinson). Subtypes of B27 were studied in two patients by PCR-SSP using primers for 11 subtypes (Dynal, Oslo, Norway).

RESULTS

The interpretation of pelvic x rays and sacroiliac CT scans was performed according to classification criteria described elsewhere.¹⁰ Difficulties in the interpretation of pelvic x rays were resolved by submitting to sacroiliac CT scan all doubtful or possible cases identified by each observer, and the definite diagnosis of sacroiliitis on CT scan was performed with the agreement of both observers.

Of the 936 subjects invited to attend the health centre, 490 (255 men, 235 women) agreed to take part (response rate

Abbreviations: AS, ankylosing spondylitis; CT, computed tomography; ESSG, European Spondylarthritis Study Group; IBD, inflammatory bowel disease; IBP, inflammatory back pain; PCR-SSP, polymerase chain reaction with sequence-specific primers; SpA, spondyloarthritis

Table 1 Features of the patients identified during the study

Age	AFS	Sex	Sacroiliitis	Other diseases	HLA class I
70	34	M	Bilateral 4		A 24,29 B 27,57 Cw 2, 0602
56	24	M	Bilateral 4	IBD, uveitis	A 24, 24 B 27,35 Cw 2, 4
76	20	M	Bilateral 4		A 2,26 B 52,15 Cw 2,1202
60	20	M	Bilateral 3	Parkinson's disease	B 27 positive, flow cytometry
57	45	M	Bilateral 2	Psoriasis	A 3,66 B14,35 Cw 1203, 1505
73	27	M	Unilateral 4	Pustulosis	A 2,32 B44,07 Cw 0501,0702
68	64	M	Bilateral 2	IBD, polyarthritis	A 11,24 B35,51 Cw 4, 1502
72	50	F	Bilateral 4		A 26,11 B44,52 Cw 0501,1202

AFS, age of first symptoms; IBD, inflammatory bowel disease.

52%). The mean age of those who agreed was 66 years for men and 67 years for women. Eight patients (seven men, one woman) had sacroiliitis confirmed by CT scan and fulfilled the ESSG criteria for SpA. This represents a figure of 1.6% (95% CI 0.8 to 2.7%): 2.7% men (95% CI 1.1 to 5.6), 0.4% women (95% CI 0.01 to 2.5). In the whole group only one patient with IBD had a previous diagnosis of spondyloarthritis.

Only three of these patients were B27 positive—prevalence of SpA/AS of 0.6% (1.2% men; 95% CI 0.24 to 3.4) (table 1). One of them, the only patient with a previous diagnosis of SpA, had IBD, grade 4 bilateral sacroiliitis, several episodes of acute unilateral uveitis, synovitis of the wrists and elbows, and spondylitis of the cervical, dorsal, and lumbar spine. The disease started when he was 24 years old, with inflammatory back pain, followed soon by enthesopathic phenomena of the legs (Achilles tendinitis). Another patient died shortly after the diagnosis of AS and DNA typing was not possible. He had had bilateral grade 3 sacroiliitis, dorsal and lumbar spondylitis, and inflammatory back pain since he was 20. Severe Parkinson's disease started when he was 44 years old, and SpA was undiagnosed. The family was unaware of any episode of peripheral arthritis or uveitis. The third B27 positive patient developed inflammatory back pain when he was 34. Since then he had developed radiological spondylitis of the cervical, dorsal, and lumbar spine, and grade 4 bilateral sacroiliitis. He denied enthesopathy, peripheral arthritis, or uveitis. Two other patients with radiological spondylitis were B27 negative. One of them had had inflammatory back pain (IBP) since he was 20, and dorsal and lumbar spine spondylitis were diagnosed together with a grade 4 bilateral sacroiliitis. There was no history of peripheral arthritis, enthesopathy, or uveitis. The other patient, who was B7 positive, had unilateral grade 4 sacroiliitis and complete fusion of the lumbar and dorsal spine. The disease started when he was 27 years old with fever, back pain, and subungual and anterior chest suppuration. A diagnosis of tuberculosis was made, though there was no confirmed bacteriology.

Two other male patients had no radiological spondylitis and were HLA-B27 negative. One of them had had non-erosive polyarthritis of hands and wrists, and IBP since he was 64 years old. Bilateral grade 2 sacroiliitis was present and IBD was diagnosed at the same time. The other patient had psoriasis and mild peripheral arthritis of the shoulders, elbows, and wrists and grade 2 bilateral sacroiliitis.

The only woman with SpA (table 1) developed IBP after she was 50 years old. She had no extrapelvic disease and was B27 negative. The disease was very mild, although she had frequent episodes of inflammatory back pain, and the sacroiliitis was bilateral.

The B*2705 subtype was identified in two patients with available DNA.

DISCUSSION

This study was designed to study the prevalence of osteoporotic fractures and was not ideal to test the ESSG criteria for SpA, although the low response rate of the subjects

who agreed to take part in the osteoporosis survey was similar to the findings in other European groups.¹¹

In the ESSG criteria, IBP and asymmetrical peripheral arthritis of the legs are the main clinical symptoms and criteria for this classification,⁴ and they were not investigated. However, as the age of the screened population was over 50, it is unlikely that a significant number of affected subjects would not have had radiographic changes. The difficulties in the interpretation of pelvic x rays were resolved through a consensus approach of radiologists and rheumatologists working together, and performing sacroiliac CT scans in all doubtful cases. Thus false positive radiographic findings are unlikely to have occurred.

Applying the ESSG criteria for SpA, the prevalence of this disease was 1.6% in our population with a background HLA-B27 frequency of 6–7% according to previous studies.^{12,13} The SpA prevalence of 1.6% is amongst the highest results found so far in European populations, but only three male patients were HLA-B27 (both sexes 0.6%; men 1.2%). The prevalence of AS and HLA-B27 in northern Norway (subjects aged 20–54) and in Finland (two groups of subjects aged 30 or more and a third group with a mean age of 48) was respectively 1.1–1.4% (B27 in the population 15.9%) and 1% (B27 in the population 15%).² Other studies in Europe showed a lower AS prevalence: in Holland, van der Linden found that the AS prevalence was 0.24% in the population over 44 years old, with a background HLA-B27 frequency of 7.8%.²

The differences in AS prevalence in different European countries may relate to the design of the studies, to genetic/environmental factors, or to the criteria that were applied. Although it is claimed that the prevalence of AS correlates with the frequency of HLA-B27 in the population,² few population studies have confirmed this relationship. Notable exceptions to this hypothesis include African studies, in which either most patients with AS are B27 negative or B27 is not associated with disease.¹⁴ Our own data showed that only three of eight patients with SpA were HLA-B27 positive. According to our data the lower the population frequency of B27, the weaker is the association between SpA and this allele, possibly because the number of B27 negative cases with SpA is unaffected by the low population frequency of B27. A further potential explanation is that community studies such as our own diagnose milder cases, and that B27 may act as a severity marker.

Only one patient with uveitis and IBD had a previous diagnosis of SpA. Although the diagnosis was obvious in a group of patients observed in our survey, they had not been previously recognised to have the disease. This has been previously reported in other surveys. In the Tromsø study only 6/27 (22%) cases had a previous diagnosis of AS.² Our results for prevalence are comparable with those of a recent German investigation in blood donors where a 1.9% prevalence of SpA was reported, although in this study the use of highly sensitive magnetic resonance imaging scanning to diagnose cases might have influenced the observed prevalence.⁶

The islands were populated after 1432 by Portuguese, Dutch (Flemish), Spaniards, Berbers, Jewish, Italians and, later,

black African slaves were also brought to the islands.^{15 16} As a consequence the allelic HLA frequencies in the Azores are not the same as in mainland Portugal¹⁷ and several HLA-B27 subtypes have been identified in the Azores, but B*2705 was the allele most commonly associated with SpA.¹⁸ In our population the diversity of subtypes had no influence on HLA-B27 SpA prevalence, which was high if compared with previous population studies in Europe.²

SpA was found with a prevalence of 1.6% of the population over 50 years old. These results must be interpreted cautiously because the response rate to the survey was low (52%). We conclude that our data provide further information about the epidemiology of SpA with a relatively high prevalence, in a southern European community with a low prevalence of HLA-B27.

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