Unusual occurrence of ankylosing spondylitis and multiple sclerosis in a black patient

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■ A possible association between ankylosing spondylitis (AS) and multiple sclerosis (MS) has been suggested in whites. The authors describe the first report of the coexistence of AS and MS in a black patient. The clinical diagnosis of MS was further substantiated by the results of magnetic resonance imaging of the brain. The diagnosis of AS met the Rome as well as the New York criteria. The patient possessed HLA-B27; his complete HLA phenotype was Aw66, B27, Cw2, DR3, and DR5.

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NEUROLOGIC abnormalities are uncommon in patients with ankylosing spondylitis (AS), mostly consisting of atlantoaxial subluxation or traumatic fracture dislocation of the vertebral column with neurologic sequelae and the rare occurrence of a cauda equina syndrome.[1–4] More recently, coexistence of AS and multiple sclerosis (MS) has been noted in a few white patients, and a possible association between the two diseases has been suggested.[2,5–7] We report the case of a black man with AS and MS—an occurrence not previously reported in blacks.

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CASE REPORT

The patient, who is left handed, started noticing left-sided weakness in 1973 at the age of 43 years, when he was working as an air-compressor repairman. Four months later, he was hospitalized, complaining of loss of balance and numbness of his left third, fourth, and fifth fingertips, and the tips of the toes of his left foot. He also complained of left arm pain in an ulnar distribution, low back pain, and left leg pain. There was no spasticity of his muscles. Myelography, nerve conduction studies, and electromyography (EMG) were performed, and all results were normal. Also normal were skull and spine radiographs, a brain scan, and serum protein electrophoresis, as well as anti-nuclear antibody (ANA) and lupus erythematosus cell (LE) tests. A lumbar puncture revealed a protein value of 43 mg/dL in the cerebrospinal fluid (CSF). At that time, a presumptive diagnosis of multiple sclerosis was made.

In early 1974, the patient needed a cane to walk. In April of that year, he attempted to return to work but could not due to chronic low back pain. In 1979, he caught his left foot in a sidewalk crack and sustained a

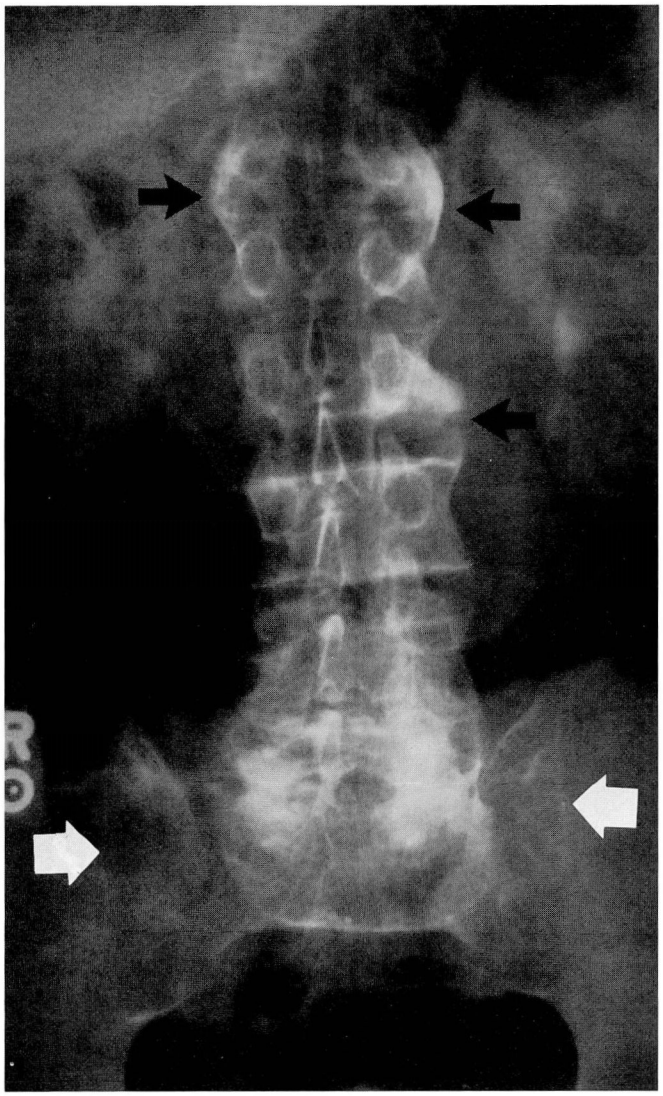

FIGURE 1. Anteroposterior radiograph of the pelvis and lumbar spine showing syndesmophytes (black arrows) and complete fusion of both sacroiliac joints (white arrows).

fracture of the left ankle. After the cast was removed, he injured his left knee when his leg collapsed while he was changing a tire. His left leg became progressively weaker.

In March 1980, the patient was hospitalized after experiencing a two- to three-minute loss of consciousness upon rising from bed. Results of computed tomography (CT) of the head and electroencephalography were normal, and ANA and LE tests were negative. A Holter monitor tracing showed sinus tachycardia, occasional supraventricular arrhythmia, and a heart rate of 88 to 150 beats per minute. He continued to complain of chronic low back pain, and he got minimal relief from low-dose ibuprofen (400 mg, twice daily).

In 1981, radiographs of his pelvis showed fusions of both sacroiliac joints. AS along with MS was diagnosed. On HLA typing, the patient was found to possess HLA-B27.

In July 1982, he was hospitalized for increasing muscle weakness and spasticity. Lateral flexion of the neck was associated with light-headedness, and forward flexion of the neck produced numbness in his right leg. There were no cranial nerve abnormalities, and his visual fields were normal. Light touch sensation was found to be diminished in the fingers of his left hand, and two-point discrimination was diminished bilaterally (4 mm on the pad of his right index finger and 8 mm on the left index finger). Vibration and temperature senses were slightly decreased in the distal lower extremities. Muscle tone was found to be increased in the left upper and lower extremities. Strength was judged to be normal (5/5) in all right-sided muscles except the hip flexors (4/5). All muscle groups on the left side were judged to be 4/5 in strength, except the left quadriceps (5/5) and hamstrings (3/5). The dorsiflexors of the left foot and especially of the left great toe were weak. The patient's gait involved left leg circumduction and toe dragging. Cerebellar function was normal, although left-sided paresis made the interpretation difficult. He was unable to execute heel-to-shin maneuvers due to stiffness. No ocular dysmetria or nystagmus was noted. The patient demonstrated negative abdominal and cremasteric reflexes. Jaw jerk was absent, and deep tendon reflexes were hyperreflexic with positive bilateral Hoffman's signs and a positive unilateral Babinski sign on the left.

An electrocardiogram showed sinus bradycardia at a rate of 58 beats per minute. Radiographs of the cervical spine showed no subluxation or fusion. CSF obtained by lumbar puncture showed one lymphocyte and two red blood cells. The glucose level was 76 mg/dL, and total protein measured 30 mg/dL. VDRL, cryptococcal antigen test, gram stain, acid fast stain, India ink stain, and bacterial culture were all negative. Head CT with and without contrast material was normal.

In 1985, the patient could walk only with the assistance of a cane or a walker. In October 1984, bilateral leg weakness developed, with the right leg weaker than the left leg. Mild spastic quadriparesis was present, and knee and ankle jerks were found to be hyperreflexic bilaterally. The left leg showed increased tone, and left ankle clonus could not be elicited. There were bilateral Babinski and Hoffman signs, and the patient's eyes

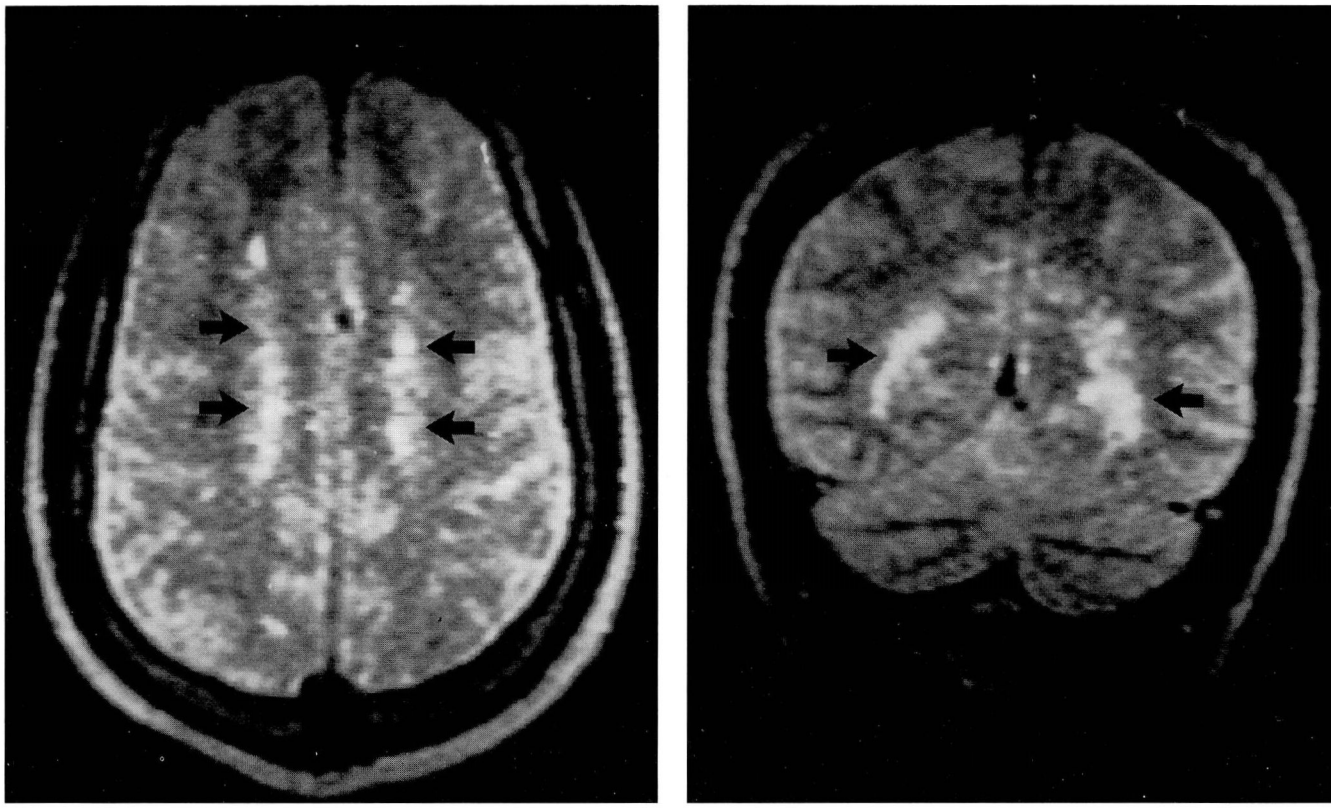

FIGURE 2. Magnetic resonance imaging of the brain showing focal areas of increased signal intensity in the periventricular area (black arrows) on T2-weighted images. These findings were consistent with a demyelinating disease process involving the periventricular white matter.

showed nystagmus on looking to the right. A radiograph of the pelvis and lumbar spine, taken in April 1985, showed bilateral complete fusion of the sacroiliac joints and syndesmophytes in the upper lumbar spine (*Figure 1*).

In May 1985, he complained of painless muscle spasms. A physical examination showed diffuse hyperreflexia and spasticity in all extremities. Range of motion in the lumbosacral spine was decreased anteroposteriorly and laterally. Brain-stem auditory evoked potentials showed a conduction deficit at the level of the pons. Visual evoked potentials showed a bilateral conduction deficit in the visual pathways. CSF analysis was remarkable for an IgG level of 8.9 mg/dL (normal, 0–8.6) and an albumin level of 19 mg/dL (normal, 11–48). The serum IgG value was 2000 mg/dL (normal, 800–1800). Panagel electrophoresis of the CSF was negative for oligoclonal banding. Head CT with and without contrast material was normal. Magnetic resonance (MR) imaging of the brain showed focal areas of increased signal intensity in the periventricular white matter, suggesting a demyelinating disease process (*Figure 2*); these findings are consistent with the diagnosis of MS. The patient's HLA phenotype was found to be Aw66, B27, Cw2, DR3, and DR5.

DISCUSSION

Our patient fulfilled the criteria for both AS and MS. He suffered from AS based on the Rome as well as the New York criteria[8,9] and also possessed the gene for HLA-B27.[10] The clinical diagnosis of MS was further substantiated by the results of the MR studies of the brain.[11] He had had a chronic neurological disease with a remitting and relapsing course for many years, with evidence of disseminated lesions in the central nervous system causing progressive motor weakness, quadriparesis, hyperreflexia, spasticity, nystagmus, and decreased sensation to light touch, temperature, and vibration.

Occurrence of MS in patients with AS has previously

been noted in whites.[2,5–7] Khan and Kushner[5] observed two whites with AS and MS, suggesting a possible association between the two diseases. Ascertainment bias makes it difficult to show a statistical association since those AS patients who also suffer from another chronic disease such as MS will more likely be observed than those with only AS or MS.[5] However, it is worth noting that we have not yet observed occurrence of MS in any of the more than 500 patients with rheumatoid arthritis, a more common chronic rheumatic disease.

The possible association between AS and MS is not clear; the two diseases may share some pathogenetic mechanism. Genetic predisposing factors play a role in both diseases.[1,12] A genetic marker called HLA-B27 shows a strong association with AS, and this association has been observed in all racial groups thus far studied.[1] However, the strength of this association varies among races. For example, 92% of white patients with AS and 8% of normal controls are B27-positive, as compared with only 50% of black patients and 2% of normal controls.[10,13] The patient described here possessed the B27 gene. The prevalence of AS depends on the racial background of the population and, to a large extent, directly correlates with the prevalence of the B27 gene in the general population[13]; for example, the prevalence of AS among American blacks appears to be approximately 25% of that in whites.[13]

The association of MS with HLA antigens A3, B7, and DR2 is observed primarily among white populations in northern Europe and the United States.[12] This association is either much weaker or has not been observed in African and American blacks, Middle Eastern populations, or Japanese.[12,14] Therefore, it is not surprising that our patient does not possess A3, B7, or DR2. MS is rarer in non-whites than in white populations of the world. Studies have shown that American blacks are at a lower risk than whites living at all latitudes.[15] A relatively higher prevalence of MS in northern Europe, as compared to southern Europe, has been related, in part, to the frequency of the A3, B7, DR2 haplotype in those populations. The frequency of this haplotype decreases along a north-south axis in Europe.

CONCLUSION

This is the first reported case of coexistence of AS and MS in a black patient. Moreover, to our knowledge, this is the first reported patient with MS and B27-positive AS in whom the demyelinating process characteristic of MS has been demonstrated by MR study of the brain. This coexistence of AS and MS in a patient, however, does not establish the presence of an association between the two diseases because of ascertainment bias inherent in any hospital-based study.[5,7] Proper epidemiological studies will be needed to demonstrate clearly that AS patients are more likely to suffer from MS or an MS-like illness than those who are unaffected by AS.

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