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THE ROLE OF HLA-B27 IN THE DIAGNOSIS OF LOW BACK PAIN

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The HLA-B27 antigen was determined in 652 patients with low back pain which had lasted for more than 3 months. A clinical and roentgenological examination of the sacroiliac joints and the thoraco-lumbar spine was performed in all the patients. The control group consisted of 302 unrelated persons who did not show signs of low back pain.

Antigen HLA-B27 was found in 276 of these 652 patients attending the ward for rheumatic diseases (42.4 per cent) and in 37 of the 302 unrelated persons in the control group (12.2 per cent). The difference is statistically highly significant ($P < 0.001$). Ankylosing spondylitis was found in 128 out of the 276 patients with low back pain and antigen HLA-B27. This demonstrates the importance of this antigen in the differential diagnosis of low back pain.

Key words: low back pain; antigen HLA-B27; diagnosis

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There are a wide variety of causes of low back pain such as inflammatory and degenerative diseases of the spine and sacroiliac joints, trauma, congenital malformations, acquired deformities, vertebral osteopathies and tumorous growths. On the other hand, changes in the skeleton and the musculature, changes in the connective and nerve tissue, vascular changes and lesions of the visceral organs, as well as psychogenic diseases, may be considered as extravertebral causes resulting in the syndrome of low back pain (Armstrong 1965).

The lumbar syndrome may sometimes be an indication of inflammatory and degenerative and other changes of the sacroiliac joints (Jajić 1975). Due to pathological changes of the spine and the sacroiliac joints, low back pain may spread into the gluteal region, downwards along the leg as far as the knee or in very rare cases as far as the foot (Ogryzlo 1974). These syndromes, especially if they are present in younger male patients, should arouse suspicion of one of the ankylosing spondylopathies and clinical and X-ray examinations and scintigraphy should be undertaken. In these cases the determination of HLA–B27 antigen is important in the diagnosis and the early application of adequate therapy. For this reason the determination of the histocompatibility antigen in all patients with low back pain of more than 3 months duration was carried out.

PATIENTS AND METHODS

Our investigation comprised 652 patients of various ages (15–70 years). There were 402 men

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(61.6 per cent) and 246 women (38.4 per cent). A clinical examination was made of the spine and sacroiliac joints in all of these test subjects and a roentgenogram as described by Bàrsony (Bàrsony & Schulhof 1931) and a roentgenogram of the thoraco-lumbar spine were taken. In some patients scintigraphy of the sacroiliac joints and the spinal column was carried out.

The control group consisted of 302 unrelated subjects without any signs of low back pain (Kaštelan et al. 1974).

The HLA antigens were determined in the lymphocytes from the peripheral blood by means of the lymphocytotoxicity test (micro-method) as described by Terasaki & McClelland (1964). For the demonstration and detection of each antigen at least two different test sera were used and for the HLA-B27 antigen, sera were taken from four different subjects.

RESULTS

We have investigated the causes of low back pain with particular regard to the presence of the HLA-B27 antigen. The HLA-B27 antigen was found in 276 patients (48.4 per cent, Table 1). On the basis of examination and the criteria applied it was established that ankylosing spondylitis was involved in 128 of these patients. The remaining 148 patients with HLA-B27 antigen did not show signs of the disease.

Table 1. Occurrence of HLA-B27 antigen in patients with low back pain

Antigen	Patients ($n=652$)		Control group ($n=302$)	
	No.	per cent	No.	per cent
HLA-B27	276	42.4 ($P<0.001$)	37	12.2

Of our 276 patients with the HLA-B27 antigen 204 were men and 72 women. Of the 128 patients with ankylosing spondylitis 114 were men and 14 women. In the remaining 376 of the 652 subjects investigated, other non "characteristic" antigens of the HLA system were found.

DISCUSSION

The HLA-B27 antigen was found in 42.4 per cent of our patients with low back pain of various origins and in 12.2 per cent of unrelated subjects in a control group. The difference in the incidence of HLA-B27 antigen between these selected test subjects and the control group was statistically highly significant ($P < 0.001$).

The finding of the HLA-B27 antigen in 1–14 per cent of healthy subjects in the general population (Tsuji et al. 1974, Tiilikainen et al. 1973) and in 53.3 per cent of relatives of patients with ankylosing spondylitis of first grade (Brewerton & James 1975) confirms the presence of the antigen before the onset of the disease, i.e. from birth. In support of this statement, in this investigation HLA-B27 antigen was found in 148 out of 652 patients (22.6 per cent) with low back pain without clinical or X-ray evidence of ankylosing spondylitis at the time. On the other hand, the HLA-B27 antigen was found in 96.8 per cent of patients with ankylosing spondylitis (Jajić & Kaštelan 1977) which stresses the important role of a genetic factor in the aetiopathogenesis of the disease and the diagnostic importance of HLA-B27 in ankylosing spondylitis and the differential diagnosis of low back pain. In spite of this fact and the existence of diagnostic criteria for ankylosing spondylitis the diagnosis is usually made at a late stage (Bingham 1977) and therefore the determination of the HLA-B27 antigen is of diagnostic, prognostic and therapeutic value.

CONCLUSIONS

HLA-B27 antigen was found in 276 out of 652 patients with low back pain (42.4 per cent) and in 37 out of 302 unrelated subjects in the control group (12.2 per cent). The difference in the incidence of HLA-B27 antigen between the selected group of subjects and the control group was statistically highly significant ($P < 0.001$).

The finding of HLA-B27 antigen in patients suffering from low back pain, especially in younger persons, indicates the need for a detailed clinical and X-ray examination and a careful observation of these patients over an extended period of time.

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