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Arthritis, Rheumatoid, Spondylitis

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Introduction

Rheumatoid arthritis (RA) and ankylosing spondylitis (AS) are among the most common rheumatic diseases. These chronic progressive inflammatory diseases lead to a reduction in physical fitness and increase in joint degeneration.[1] Although very closely related, their symptomatology and etiology are different. In the past, AS was often diagnosed inaccurately as RA, but the two have recently been recognized as separate, distinct clinical entities. The latter has been attributed to advancing diagnostic and laboratory techniques able to differentiate the two conditions.[2] That being said, the diagnostic differentiation still remains a challenging task for clinicians.

Both RA and AS can be similarly characterized by the presenting symptoms, radiographic characteristics, and serological testing. However, RA and AS have widely different characteristics with respect to each one's pathophysiology and underlying genetic parameters.[3][4] This makes the probability of a patient having both conditions rather low. Considering that the two have some similar clinical manifestation such as changes on radiography or peripheral/morning stiffness, however, the diagnosis can be a challenge, and more tests may be required to establish the correct etiology.[5] Furthermore, authors have reported cases of coexisting AS and RA since 1976.

Etiology

Various studies have suggested that rheumatoid arthritis (RA) and ankylosing spondylitis (AS) have overlapping etiologies.[6] These suggestions are based on the different genetic backgrounds that result in the development of the conditions in a patient. If a patient has human leukocyte antigen (HLA) HLA-DR4 of RA and the predisposing HLA-B27 of AS at the same time and is affected by an environmental agent, then there is a chance of RA and AS coexistence.[7] The first case of simultaneous RA and AS was reported in 1976. Since that first report, there have been fewer than 60 such cases reported.[8] This under-reporting can be attributed to the lack of clinical examination, observation, or complete evaluation.

Epidemiology

The occurrence of rheumatoid arthritis (RA) and ankylosing spondylitis (AS) in the general population has a frequency between 0.3% and 1.5%.[9] AS is more common in males and RA is more common in females. AS associated symptoms show before the age of 30, but RA happens later, between 40 and 50 years of age.

Studies estimate that 90% of patients with RA develop cervical spondylitis. However, recently RA cervical spondylitis presents with classic patterns of instability, including atlantoaxial subluxation, subaxial subluxation, and basilar invagination. The latter occurs in about 20% of RA patients [10].

Globally, the prevalence varies depending upon the ethnic group and with the prevalence of human leukocyte antigen (HLA)-B27. The prevalence of AS is approximately 5% to 6% among people who are HLA-B27-positive.[11]

Pathophysiology

Epidemiological data cites that both rheumatoid arthritis (RA) and ankylosing spondylitis (AS) have hereditary predilections. ertain families, as well as identical twins, promote the importance of genetic factors (60% association in RA), but environmental factors certainly play a role.

In RA cases, HLA-DR4 and HLA-DR1 are thought to be very important genetic background. This is particularly true among smokers with a positive anti-cyclic citrullinated peptide (anti-CCP). HLA-B27 is the strongest genetic association of AS (first reported in 1973), but HLA-DRB1 has also been linked to this disease. HLA-B27 is not associated with RA.

The genetic predisposition and environmental factors will start an autoimmune reaction and antibodies will attack the synovium, soft tissue, causing inflammation and gradual destruction in the organs.

History and Physical

Symmetrical inflammation of various joints of the hands and feet (metacarpophalangeal, proximal interphalangeal, wrist, and metatarsophalangeal joints) are the most common initial manifestations of rheumatoid arthritis (RA). The morning stiffness feeling often lasts more than an hour. As the disease progress, erosion happens, leading to the characteristic deformation of the fingers and toes.[12]

Rheumatoid Spondylitis

Diagnostic criteria for RA include inflammatory arthritis involving three or more joints and lasting more than 6 weeks, positive rheumatoid factor (RF), and/or anti-citrullinated peptide/protein antibody testing. Inflammatory markers such as C-reactive protein (CRP) or the erythrocyte sedimentation rate (ESR) can be elevated, and symptoms cannot be attributed to other pathologies such as psoriatic arthritis, acute viral polyarthritis, polyarticular gout or calcium pyrophosphate deposition disease, and systemic lupus erythematosus.

Patients with RA that develop cervical spondylitis can present with occipital headaches secondary to compression of the greater occipital branch of the C2 nerve, which occurs secondary to degeneration of the C1-C2 joint.

A classic grading system that has been utilized to categorize severity of neurologic impairment with RA spondylitis is the Ranawat Classification System:

- Grade I: Subjective paresthesias, pain
- Grade II: Subjective weakness, upper motor neuron findings
- Grade III: Objective weakness, upper motor neuron findings
    - IIIA: Ambulatory
    - IIIB: Nonambulatory

Careful consideration is given to IIIB patients as the literature notes significant controversy with respect to additional benefits (at the cost of significantly high morbidity rates postoperatively) in managing these patients with surgical intervention. [13]

Ankylosing Spondylitis

Ankylosing spondylitis (AS) is normally classified as an axial spondyloarthropathy and mainly presented with chronic back pain and bilateral, severe arthritis of the sacroiliac joints and lumbosacral spine. Back pain is severe and starts before age of 40. It is insidious in onset, improves with exercise but not with rest, and is worse at night. AS can lead to disabling spinal fusion and hyperkyphosis. Peripheral arthritis only happens in about a third of cases. If they happen, changes are asymmetric and involve one large joint like the hip, knee, or shoulder. Erosion is rare.[11]

Axial spondyloarthritis consists of AS and non-radiographic axial spondyloarthritis, which are characterized by symptoms of spinal inflammation and other features shared with spondyloarthritis in general.[14][15][16][17]

Evaluation

Ankylosing spondylitis (AS) happens at a younger age and involves the sacroiliac joints in an HLA-B27-positive male patient. Rheumatoid arthritis (RA) cases usually involve middle-aged females with symmetrical small hand and wrist joint involvement. Tests for ESR, CRP, rheumatoid factor, anti-CCP antibody, HLAB27, HLA-DR2, and HLA-DR4 are all helpful in diagnosis. The first of these are nonspecific.[18]

Plain x-rays show sacroiliitis in axial AS and most patients with non-axial AS. Magnetic resonance imaging (MRI) shows bone edema and more subtle changes of inflammation.[19]

AS and RF can co-exist, however, some studies have indicated that there is no erosion polyarthritis among AS patients who have a positive rheumatoid factor test.

Treatment / Management

Treatment of both groups somewhat follows the same algorithm, although individualized treatment is the goal. The level of disease activity, the presence of poor prognostic factors or concomitant illnesses, functional impairment, the patient's tolerance of medication, the risk of adverse effects, the expectations of treatment, and other psychosocial factors must be considered.[20]

NSAIDS and pain medication are usually the first choice and can be given for weeks to months. Exercise and physical therapy will benefit all and prevent long-term joint stiffness, damage, and functional impairment. Traditional biologics such as methotrexate, Leflunomide and sulfasalazine are effective in RA but not AS. Anti-tumor necrosis factor agents are effective in AS. Systemic glucocorticoids are best avoided especially in long-term.

Surgical interventions are tailored to individual patients. Fusion of the atlantoaxial joint of the cervical spine is needed if there is significant neck or occipital pain or evidence of neurologic dysfunction due to C1-C2 subluxation, as occurs in patients with rheumatoid arthritis but not AS. Joint replacement might be needed.

Differential Diagnosis

Axial AS patients may also have peripheral arthritis, enthesitis, and dactylitis, which can lead to a wrong diagnosis of RA.

Prognosis

Both diseases are chronic and can be managed over time for years before fatal complications happen. Many of the symptoms can be effectively controlled via medical and surgical means. Risk of cardiovascular diseases is increased in both entities, possibly secondary to the generalized inflammation that is present. Therefore, many of these patients suffer or pass away prematurely from cardiac causes, not necessarily RA and AS.[21][22][23]

Consultations

Consult rheumatology, orthopedic surgery, and rehabilitative services.

Pearls and Other Issues

Rheumatoid spondylitis in elective surgery:

- Any patient with RA should have flexion/extension films prior to having elective surgery
- RA spondylitis most commonly affects the occipitoatlantoaxial joint

- Ranawat grade IIIB patients (nonambulatory) have high associated morbidity when it comes to performing surgical intervention -- thus the literature is very controversial with respect to the use of surgery in this unique subset of RA spondylitis patients

Enhancing Healthcare Team Outcomes

Rheumatological diseases are chronic entities, and close work of an interdisciplinary team is needed for their management. Rheumatologists, orthopedic surgeons, primary care physicians, pharmacists, and physical therapists are all taking part in the lifelong challenge of controlling patient symptoms and increasing the quality of care and quality of life.

Questions

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