Initial evaluation of the arthritic patient

Piecing together the diagnostic clues

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Preview

Arthritis, one of the earliest known diseases, remains a leading cause of chronic pain and disability. Because of the many forms and causes of rheumatic disease, pinpointing a diagnosis is often difficult. In this article, Dr Gaylis presents an approach to the arthritic patient that will help the physician narrow down the diagnostic possibilities and arrive at a rational therapeutic plan tailored to the patient's needs.

Arthritis and other rheumatic diseases are estimated to account for at least 10% to 15% of patient visits to primary care physicians. A major proportion of patients with chronic pain and disability have a rheumatic disease.

The term "arthritis" is commonly misused by both physicians and patients. Arthritis is not a specific disease but literally means an inflamed joint or joints. Because acute and chronic inflammation of joints occurs with many diseases, the scope and spectrum of arthritis can be very complex unless a pattern of recognition and treatment is established. In many cases, arthritis is simply the "tip of the iceberg"—the most apparent manifestation of some complex and far-removed immunologic or inflammatory disorder.

Proper management of any chronic disorder depends on the establishment of a specific diagnosis followed by the institution of appropriate treatment. Precise diagnosis of rheumatic disease, however, is difficult. Many patients present with vague rheumatic symptoms that may result from several disorders, and thus a specific diagnosis often cannot be made on initial evaluation. Although laboratory tests may help the physician narrow down the diagnostic possibilities, test results are often inconclusive and at times misleading. Indeed, rheumatologists often must "undo" an incorrect diagnosis because too much emphasis was placed on laboratory studies.

Patient evaluation

Since rheumatic symptoms are often vague and laboratory studies may be inconclusive, the physician evaluating an arthritic patient needs to develop a working (ie, the most likely) diagnosis based on results of the history and physical examination. This diagnosis may, of course, change as the illness unfolds. The most helpful clue to initial diagnosis of rheumatic disease is the recognition of patterns of joint involvement and other relevant clinical features. Essentially, evaluation of the arthritic patient is similar to putting together a jigsaw puzzle: The physician systematically arranges the pieces as they become available and continues to observe the patient for further relevant information, using laboratory aids as an additional, but not isolated, source of information.

A workup plan such as the one I will outline, when followed systematically, allows classification of rheumatic disease into a diagnostic category and, at best, points to a specific problem. The majority of rheumatic disorders fall into one of three categories: diffuse systemic, localized articular, and nonarticular rheumatic disease (table 1). On the basis of the classification, the physician can suggest initial therapeutic measures or refer the patient to an appropriate subspecialist.

Table 2 lists the important historical, physical, and laboratory information to be obtained on initial evaluation as well as subsequent patient visits. The initial findings, together with a record of the variability of these findings over time, should enable the physician to recognize a pattern of involvement, reach a diagnosis (or identify a diagnostic category), and then alter therapy as needed. Generally, patients with chronic rheumatic disease are given many medications

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Table 1. Diagnostic categories of rheumatic disease

Category	Findings	Potential diagnoses
Diffuse systemic articular disease	Fever, weight loss, other systemic symptoms and signs, pain/morning stiffness > 1 hr, ESR elevation (Westergren), anemia, inflammatory joint fluid without crystals, suggestive serologic findings (eg, on latex agglutination, ANA tests), true joint inflammation, muscle weakness, x-ray examination	Rheumatoid arthritis, systemic lupus erythematosus, vasculitis, polymyalgia, polymyalgia rheumatica, spondyloarthropathies (eg, ankylosing spondylitis, Reiter's syndrome, psoriatic spondylitis), inflammatory myopathy, other less common disorders
Nonarticular disease	Soft tissue swelling, nonarticular involvement, nonarticular point tenderness, x-ray examination when indicated	Fibromyalgia syndrome, tenosynovitis, bursitis, low back pain syndrome
Localized articular disease	Localized joint pain/tenderness, bony enlargement, soft tissue swelling, joint fluid crystals, serum uric acid, x-ray examination	Osteoarthritis, crystal-induced arthritis (gout, pseudogout)

Adapted from Blechman WJ. Initial management of arthritis. New York: Pfizer Laboratories Division Educational Seminars, 1985.

over the course of their illness; changes in medication are usually suggested by variations in the historical and physical findings over time.

HISTORY—Musculoskeletal symptoms, including pain, stiffness, deformity, and loss of function, are the most important complaints to be elicited in history taking. The major complaint of most patients with rheumatic disease is pain. In assessing its characteristics, the physician should study a number of variables.

The *intensity* of the pain will guide the aggressiveness of therapy. (Pain threshold varies from person to person.) Except for the relatively uncommon palindromic rheumatism, most chronic rheumatic disorders produce persistent pain, which may vary in intensity with the time of day. For example, the pain in rheumatoid arthritis tends to be worse in early morning, whereas the pain in osteoarthritis may worsen as the day goes on. The pain in tendonitis and bursitis intensifies rapidly in early morning and is aggravated by activity.

The pain's *location* helps the physician establish an etiology and diagnosis. The pain in rheumatoid arthritis classically involves both small and large joints and is symmetric, while the pain in osteoarthritis usually involves weight-bearing or functional joints and may be asymmetric. The pain in tendonitis and bursitis is usually acute and localized. Entrapment syndromes and radiculopathies may cause referral of pain from primary to distant sites; for example, pain due to synovitis in the hip may be referred to the knee. Migratory arthralgias are common in acute rheumatic fever and, at times, are seen in systemic lupus erythematosus, early rheumatoid arthritis, gonococcal arthritis, and leukemia. Pleuritic chest pain, common in the connective tissue disorders, may

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mimic costochondritis, but the pain of the latter is "palpable."

Preventive measures are extremely important in the management of arthritis, and therefore possible precipitating factors should be sought. For example, excessive weight-bearing exercises such as walking often aggravate, rather than help, osteoarthritis of the back, spine, and weight-bearing joints. Exposure to cold may bring on Raynaud's phenomenon and severe pain in the extremities.

The range, severity, and timing of joint stiffness help differentiate the various arthritic disorders. Early-morning stiffness is a classic feature of rheumatoid arthritis and other inflammatory diseases of the synovium, whereas acute, severe stiffness after inactivity ("gelling") is a prominent feature of osteoarthritis. Persistent pain and stiffness in the muscles throughout the day are seen in fibromyositis. The duration of morning stiffness can measure disease activity and guide adjustments in therapy.

Other important historical features include the patient's complaints of joint swelling (often absent on physical examination), muscle and joint weakness, and an inability to perform functional activities of daily living (table 2). Depression, another potential finding, can cause, mimic, or result from general or localized weakness and fatigue. A number of rheumatic disorders are likely influenced by emotional or physical stress, and one school of thought even purports that stress may exacerbate some arthritic disorders, including rheumatoid arthritis. Certainly, fibromyositis is stress-related. When this condition is suspected, the patient's sleep patterns should be evaluated. Generally, patients with fibromyositis are more exhausted on awakening than they were on going to sleep. Sleep studies have shown that these patients are unable to reach deep sleep. Many patients with fibromyositis are perfectionists who also have a number of other psychosomatic symptoms, such as migraine headaches and emotional lability.

Table 2. Information to be elicited on initial patient evaluation

Historical	Physical
Musculoskeletal	Joint findings
Location of symptom	Tenderness
Joint pain, tenderness, swelling	Swelling
Muscle pain, aching, stiffness	Heat
Morning stiffness > 1 hr	Deformity, instability, motion
Diurnal variation	Nonarticular swelling
Aggravating events	Nonarticular tenderness
Systemic	Muscle weakness
Fatigue	Subcutaneous nodules
Fever	Rash
Weight loss	Lymph node enlargement
Skin rash	Liver/spleen enlargement
Gastrointestinal symptoms	Other organ involvement
Genitourinary symptoms	Vasculitis lesions
Depression	Functional impairment
Other psychological problems	
Sleep disturbance	**Laboratory**
Other organ symptoms (specify)	CBC
Family history	ESR (Westergren)
Drug tolerance	Rheumatoid factors (latex agglutination test)
	Antinuclear antibodies
	Uric acid
	Muscle enzymes
	Joint fluid
	X-ray

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Table 3. Synovial fluid findings in rheumatic diseases

Disease	Clarity	Color	Viscosity	Mucin clot	WBCs/mm³	% p leuk
Normal	Transparent	Clear to straw	High	Good	< 200	< 2
Noninflammatory fluid						
Trauma	Transparent to turbid	Straw to red to xanthochromic	High	Good	< 2,000 (few to many RBCs)	< 2
Osteoarthritis	Transparent	Yellow	High	Good	1,000	< 2
Inflammatory fluid						
Systemic lupus erythematosus	Slightly cloudy	Straw	High to decreased	Good to fair	3,000-20,000	10-2
Rheumatic fever	Slightly cloudy	Yellow	Decreased	Good	10,000-30,000	10-5
Reiter's syndrome	Cloudy	Yellow	Decreased	Fair	15,000	60
Pseudogout	Slightly cloudy (if acute)	Yellow	Decreased	Fair	1,000-15,000	Usua
Gout	Cloudy	Yellow to milky	Decreased	Fair to poor	10,000-12,000	60-7
Rheumatoid arthritis	Cloudy	Yellow to greenish	Low	Fair to poor	15,000-20,000	60-7
Septic fluid						
Tuberculous arthritis	Cloudy	Yellow	Low	Poor	25,000	50-6
Septic arthritis	Turbid to purulent	Grayish or bloody	Low	Poor	Usually > 100,000 but may be much lower	75

Adapted from Joint fluid aspiration and analysis—rheumatological disorders: an office guide to differential diagnosis. Palo Alto, CA: Syntex Laboratories, 1978.

Physical examination of the arthritic patient includes the physician's observations of how well the patient can ambulate, get in and out of a chair, and get undressed.

% polymorphonuclear leukocytes	Glucose	Special findings
< 25	Nearly equal to blood	
< 25	Nearly equal to blood	A few cartilage fragments
< 25		Many cartilage fragments
10-20	< 25 mg/dl, lower than blood	LE cells may be demonstrated in culture (Wright stain); complement often decreased
10-50		
60		Complement often increased
Usually < 50		Calcium pyrophosphate crystals; positively birefringent
60-70		Monosodium urate crystals; negatively birefringent
60-70		Complement low, may see crystals of cholesterol
50-60	< 25 mm/dl, much lower than blood	Culture may be positive, acid-fast bacteria may be demonstrated in smear
75		Culture usually positive except in gonococcal arthritis

Often patients have nonarthritic or nonrheumatic complaints that are important clues to diagnosis, for example, symptoms secondary to inflammation of the skin, vital organs, CNS, and gastrointestinal and genitourinary tracts. The patient's family and social histories may also provide important diagnostic information. Finally, the patient's ability to tolerate medications, particularly nonsteroidal antiinflammatory agents, should be noted in history taking, to avoid aggravating existing symptoms or precipitating new ones with poor choices of drug therapy.

PHYSICAL EXAMINATION—The physical examination actually begins when the patient walks into the physician's office. The physician can observe how well the patient can ambulate, get in and out of a chair, and get undressed. Because arthritic complaints are often the end result of far-removed inflammatory reactions, the physical examination must be based on a complete general examination.

Joints are examined by the time-tested methods of inspection, palpation, and movement. The exact point of tenderness must be identified. Frank joint pain should be distinguished from pain and swelling around the joints (ie, periarthritis, which includes tendonitis, bursitis, and fibrositis). Swelling within joints

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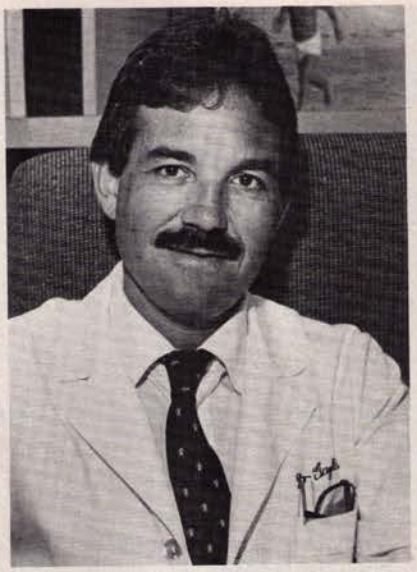
On the basis of relevant information obtained from the patient history and physical examination, the physician can select laboratory tests appropriate to the specific diagnosis he or she has in mind.



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strongly suggests synovial effusions, and aspiration of synovial fluid should be considered for both diagnostic and therapeutic reasons, as will be discussed.

Joints are palpated to detect subluxation, dislocations, and angulation deformities. Active and passive motion of joints is tested. Restricted movement, joint instability, and joint crepitus are noted. Functional joint strength, as well as the strength of the various muscle groups, is measured. Particular attention should be given to the presence of muscle atrophy, which may be primary to an underlying muscle disorder or secondary to muscle disuse due to joint pain. Baseline grip strength and joint motion should be measured on the first patient visit and at each subsequent visit for comparison. The presence of subcutaneous nodules, tophi, skin and hair changes, and mucous membrane abnormalities should also be noted.

LABORATORY AND RADIOLOGIC STUDIES—Having obtained relevant information from the patient history and physical examination, the physician can select laboratory tests appropriate to the specific diagnosis he or she has in mind. Very few tests are absolutely diagnostic; most test results simply add to or confirm the clinical diagnosis. An exception is synovial fluid studies, which can be diagnostic (eg, positive cultures, the presence of cholesterol crystals).

Common baseline laboratory studies that are useful in diagnosis of many rheumatic diseases include a CBC, ESR (Westergren), and chemical analyses, particularly of uric acid, calcium, and muscle enzymes. In selected cases, presence of antinuclear antibodies, hepatitis B antigen, positive blood cultures, immune

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