

## A patient with musculoskeletal (MSK) pains - clinical approach

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Joint complaints make an important component of musculoskeletal system (MSK) diseases. In this write-up the importance of a clinical approach for categorizing joint diseases based upon the number of involved joints (monoarthritis or polyarthritis), duration of disease (<6 weeks – acute; >6 weeks – chronic) and whether the problem is inflammatory or non-inflammatory in nature, has been highlighted. Classifying patients on these clinical grounds helps in streamlining their management

(e.g. primarily a problem of physician-rheumatologist, a physiatrist – rehabilitation expert or a joint surgeon). It provides the appropriate management strategy for such patients.

*Key words:* arthritis, monoarthritis, polyarthritis, MSK diseases

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### Introduction

Approximately a quarter of patients attending any general outpatient clinic have complaints related to musculoskeletal (MSK) system.<sup>1</sup> It is ironical that despite such high prevalence and impact of MSK diseases, this is not reflected in the undergraduate curricula in most medical schools.<sup>2-5</sup> At the Faculty of Medicine, Kuwait University, however, a separate teaching block has been reserved for MSK system from the outset of the medical course. Over the years MSK system teaching of medical students has become more and more refined in Kuwait. With the final report of the undergraduate medical curriculum for MSK diseases already published,<sup>6</sup> it is expected that Kuwait University would also incorporate these suggestions in their teaching of MSK diseases.

When confronted with a patient with MSK symptoms most doctors feel uncomfortable

because of their lack of clinical training in this specialty. Therefore, by default such patients reach orthopedic surgeons for help. Unfortunately, a significant proportion of patients with MSK diseases have serious systemic/multi-system/multi-organ problems that could be life-threatening – the so-called red flag MSK diseases. Orthopedic surgeons have little to offer to such patients. On the other hand, a large proportion of patients with MSK diseases have mechanical/structural, or local/regional conditions, the so-called green flag MSK diseases. These conditions require help of physical medicine and rehabilitation experts (physiatrists) and experts in orthotics and appliances along with orthopedic surgeons who could step in if physical modalities of treatment and orthotic appliances fail to provide relief. Under these circumstances there are two possible options to help the patients with MSK diseases.

The first option is that the primary care physicians/general physicians acquire expertise to distinguish 'red flag' musculoskeletal diseases from the 'green flag' musculoskeletal diseases. Then, patients could be referred to a physician-rheumatologist for the management of 'red flag' MSK diseases while those with 'green flag' MSK diseases get referred to experts in physiatry/orthotics or orthopedic surgeons.

The second option is to have the discipline of Rheumatology and musculoskeletal diseases where a team consisting of a physician with expertise/training in MSK diseases (the rheumatologist), a physiatrist with expertise in physical medicine and rehabilitation, a specialia-

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list in orthotic devices, and orthopedic surgeon with expertise in joint and soft-tissue surgery, work together as a team to provide the best possible management. In most of the advanced medical centers around the world the second approach is being followed with great patient satisfaction.

This write-up focuses on the main clinical features that distinguish 'red flag' musculo-skeletal diseases from 'green flag' musculo-skeletal diseases. It has been observed that competence in distinguishing inflammatory from non-inflammatory MSK diseases is crucial for the training of medical students in dealing with MSK diseases later in their career. In a recent report 78% of the Resident doctors failed to demonstrate this basic competency.<sup>7</sup>

## Demography and Epidemiology of MSK Diseases

MSK diseases are usually considered problems of aging population. Most often elderly persons suffer from wear-and-tear related mechanical/structural problems of the MSK system, i.e. osteoarthritis. However, more serious varieties of MSK diseases, the so-called 'red flag' conditions, occur more often in persons in the younger age group. Thus, most of the crippling, disabling or life-threatening MSK diseases occur in persons below fifty years of age and

**Table 1. Common musculoskeletal diseases classified according to age**

- Pediatric age group
  - Monoarthritis – sepsis
  - Polyarthritis: Juvenile idiopathic arthritis (JIA; old name juvenile rheumatoid arthritis (JRA), juvenile chronic arthritis (JCA))
  - If heart symptoms and/or heart involvement with only transient joint symptoms that respond dramatically to aspirin (not persisting for more than a few days): acute rheumatic fever
- Young adults and middle-age (16-50 yr)
  - (Immuno)-Inflammatory arthritides – seropositive rheumatoid arthritis and a variety of seronegative arthropathies (see text)
  - Systemic vasculitides
- Elderly above the age of 50 yr
  - Osteoarthritis
  - Crystal arthritis (mostly males)

(The list is not exhaustive, only a few common conditions have been mentioned. The classification of diseases in these age-groups is NOT water-tight, it is only a rough guide).

much more often in women. Even the pediatric age group is not spared as some of the more serious inflammatory diseases of the MSK system occur in children. Some common MSK

diseases occurring in different age groups are given in Table 1. Classifying MSK diseases based on age of onset is a convenient clinical method for narrowing down diagnostic possibilities.

In recent years the topic of clinical approach to joint disease has been addressed by several authors.<sup>8-11</sup> The approach described below is based on these articles and their application in day-to-day clinical practice.

## Classification of MSK Diseases

For a clinician, classifying MSK diseases based upon distinction between inflammatory vs. non-inflammatory is most practical and useful. Yet, studies have shown that this crucial point is not adequately emphasized during undergraduate teaching of MSK diseases.<sup>12,13</sup> Clinically such distinction is important because it helps in categorizing serious systemic illnesses with bad prognosis from mechanical/structural/local/regional MSK conditions that are not life-threatening (Table 2).

**Table 2. The two main categories of musculoskeletal (MSK) diseases**

- |   |
|---|
| A. Non-inflammatory MSK conditions ('Green flag MSK diseases')  |
| <ul style="list-style-type: none"> <li>• Mechanical/structural problems</li> <li>• Local and regional problems</li> <li>• Psychogenic and somatization               <ul style="list-style-type: none"> <li>– Diffuse aches and pain months/years</li> <li>– No objective signs ever except multiple tender spots!</li> </ul> </li> </ul> |
| B. Inflammatory MSK conditions ('Red flag MSK diseases')  |
| <ul style="list-style-type: none"> <li>• Serious systemic problems with:               <ul style="list-style-type: none"> <li>– Definite objective swellings in the joints, other physical findings</li> <li>– Gross laboratory abnormalities, e.g. in ESR, platelets etc.</li> </ul> </li> </ul>   |

## Clinical Evaluation of Patients with MSK Diseases

The basic aim of the clinical evaluation of patients with MSK is the same as in any clinical situation, namely:

- Correct categorization of the patient into inflammatory and non-inflammatory MSK disease;
- Establishing an exact diagnosis within these categories;
- Identifying the complications of the disease;
- Assessing the structural damage and functional disabilities;
- Recognizing the co-morbid conditions for appropriate planning of the treatment.

Among patients with MSK diseases it may not always be possible to establish an exact diagnosis in early stages. Yet, from the management standpoint it would suffice to classify them into inflammatory and non-inflammatory categories and initiate the preliminary treatment till the final diagnosis is reached.

Patients with musculoskeletal problems could have any of the following presenting complaints:

- Joint pains;
- Arthritis/artralgias, (“I have arthritis!”);
- Joint swelling (synovial, effusion, bony);
- Diffuse musculoskeletal pains, (“I have pains all over body!”);
- Stiffness that sets in on immobility of the joints;
- Back pain.

The anatomical basis of pain arising in MSK system could be:

Joint:

- Synovium - synovitis;
- Joint capsule - capsulitis.

Periarticular - soft tissue:

- Bursa - bursitis;
- Tendon sheath - tenosynovitis;
- Tendon - tendonitis;
- Insertion of tendon, ligaments – enthesitis;
- Bone.

Clinically it is important to distinguish whether the pain is arising from the joint (i.e. arthritis) or from periarticular soft tissue (soft tissue rheumatism) or bone (bone diseases). Pain arising from periarticular soft tissue can be easily differentiated from that arising from joint on clinical grounds. Thus, the pain of soft-tissue rheumatism has the following characteristics:

- Pain elicited with active but NOT on passive movements;
- Tenderness away from the line margin;
- Swelling usually away from the joint (but periarticular swelling may be caused by these conditions);
- Dramatic relief with local steroid injections in inflammatory conditions.

Pain caused by bone diseases may sometimes be difficult to distinguish from that from the joints. This is especially true of diffuse bone disorders (metabolic bone disease, mul-

tle myeloma etc.) or the bone diseases occurring at multiple sites, e.g. multi-site osteonecrosis, multi-site osteomyelitis. As a general rule, the bone diseases cause symptoms that are much worse at night. It is important to remember that this category must also be considered in the differential diagnosis of any MSK pains.

Once it is certain that the pain is arising from the joint(s) a focused clinical history would give away the diagnosis in most of the cases. Although a thorough history would include a large number of clinical points related to MSK system (e.g. site of pain, character of pain, radiation of pain, intensity of pain, duration of complaints, periodicity of pain, circumstances of onset, aggravating and relieving factors, associated features including the duration of early morning stiffness, extra articular manifestations etc.; any significant past history or history of rheumatic diseases in the family), in the clinical evaluation of a patient with musculoskeletal complaints the following points need special emphasis:

*Point No. 1: Duration of joint pain – <6 weeks; >6 weeks: acute or chronic.*

*Point No. 2: Number of involved joints – single joint (monoarthritis) or >1 joint (polyarthritis)*

It may sound simple but before labeling the disease as ‘monoarthritis’ one must carefully examine the patient, for it is not uncommon that the patient may be complaining of pain and/or swelling only in one joint while actually the physical examination would reveal the presence of inflammation in several additional joints.

Thus, after eliciting clinical history and confirming the number of the involved joints and the duration of the complaints, the problem of the patient could be classified into any of the following four categories:

- Acute monoarthritis;
- Chronic monoarthritis;
- Acute polyarthritis;
- Chronic polyarthritis.

*Point No. 3: The next and possibly the most important point in MSK diseases that needs to be ascertained is whether the MSK disease is inflammatory or non-inflammatory.*

It cannot be overemphasized that differentiation between inflammatory and non-inflammatory MSK diseases makes all the

difference between satisfactory or unsatisfactory management of the patients. Clinical history, physical examination and laboratory investigations that help in distinguishing the inflammatory from non-inflammatory MSK diseases are given in Table 3.

**Table 3. Clinical and laboratory parameters indicative of inflammatory rheumatic disease**

|   |  |
|---|--|
| A. Clinical   |  |
| • Subjective  |  |
| – Significant early morning stiffness (>30 min. at least)   |  |
| – Symptoms improve on gentle use of joints  |  |
| – Spontaneously up-and-down course ('spontaneous flares')   |  |
| – Constitutional symptoms (e.g. fatigue, loss of appetite, loss of weight, low-grade fever/drenching night-sweats)<br>(presence of any one or more of the symptoms indicate inflammatory musculoskeletal problem) |  |
| • Objective   |  |
| – Presence of local signs of inflammation (difficult to elicit in chronic cases)  |  |
| B. Investigative  |  |
| • High erythrocyte sedimentation rate (Westergren, fasting)   |  |
| • Normocytic normochromic anemia  |  |
| • Thrombocytosis (> 400,000/cmm)  |  |
| • White blood cell count may be high  |  |
| • Reversed albumin/globulin ratio   |  |
| • Moderate elevation of alkaline phosphatase  |  |
| • High C-reactive protein levels  |  |

(Note: In most inflammatory rheumatic conditions usually several of these parameters may be abnormal. However, some conditions do not consistently show these abnormalities, e.g. systemic lupus erythematosus where platelet, WBC are usually not elevated and ESR may be normal even during active disease; scleroderma usually does not show these abnormalities; ankylosing spondylitis may only show a few abnormalities while the other parameters may remain normal.)

Clinical evaluation would thus help in categorizing the patients into the following: true arthritis, local/regional MSK problem (soft-tissue rheumatism, peri-arthritis), or bone disease (osteonecrosis, osteoporosis, others).

Arthritis could be classified into any of the 8 following categories:

| <b>Acute (&lt; 6 weeks)</b> | <b>Chronic (&gt; 6 weeks)</b> |
|-----------------------------|-------------------------------|
| <b>Inflammatory</b>         | <b>Inflammatory</b>           |
| 1. Monoarthritis            | 3. Monoarthritis              |
| 2. Polyarthritis            | 4. Polyarthritis              |
| <b>Non-inflammatory</b>     | <b>Non-inflammatory</b>       |
| 5. Monoarthritis            | 7. Monoarthritis              |
| 6. Polyarthritis            | 8. Polyarthritis              |

Inflammatory arthritis is further categorized in:

Arthritis with predominant articular involvement;

Arthritis with prominent extra-articular manifestations.

Careful review of systems would help in this distinction. Particular emphasis should be given to the involvement of:

Skin, mucosa;

Eyes;

Gastrointestinal tract;

Genito-urinary manifestations;

Renal diseases;

Symptoms suggestive of the involvement of the cardiovascular, respiratory, hematological or neurological system.

Inflammatory polyarthritis presenting predominantly with articular symptoms is further classified into:

Seropositive arthritis - prototype rheumatoid arthritis (SPRA);

Seronegative inflammatory polyarthritis (SNIPA) – often called 'mimics' of rheumatoid arthritis.

Clinical distinction between these two categories may not always be possible, especially in the early stages of the disease before the pattern of joint involvement and extra-articular features are fully evolved. Usually the number and pattern of joint involvement associated with the extra-articular features help in distinguishing the two categories. Thus, whether it is an oligoarthritis (2, 3 or 4 joints only), involves mainly the peripheral or mainly the axial joints, involves mainly the lower segment or equally affects both the upper and lower segments of the body, specifically involves certain joints or spares them, is it a recurrent, additive or migratory joint disease, a family history of a certain disease(s) (e.g. psoriasis in a family member) are some of the clinical points that help in distinguishing different varieties of inflammatory arthritides.

These fine distinctions are not necessarily meant for general practitioners or primary care doctors. These are better left for the rheumatologists to be concerned about.

Inflammatory polyarthritis presenting with prominent extra-articular symptoms include the following conditions:

- Skin and/or mucosal involvement is prominent:
  - Psoriatic arthritis;
  - Behcet's disease;
  - Systemic lupus erythematosus;
  - Scleroderma (systemic sclerosis);
  - Dermatomyositis;

- Reiter's disease;
- Cutaneous vasculitic syndromes;
- Panniculitides: erythema nodosum syndrome, Weber-Christian disease;
- Lofgren's syndrome (acute onset sarcoidosis);
- Rare conditions: Multicentric reticulohistiocytosis.
- Gastrointestinal symptoms are prominent:
  - Inflammatory bowel disease;
  - Enteropathic form of reactive arthritis.
- Urogenital symptoms are prominent:
  - Urethritic form of reactive arthritis including Reiter's disease.
- Other systems:
  - Polymyositis (muscles);
  - Sjögren's syndrome (lacrima, salivary and parotid gland involvement prominent, often with the involvement of other exocrine functions);
  - Severe systemic necrotizing vasculitides (multisystem);
  - Still's disease and adult-onset Still's disease (rash, throat, serositis, hepatosplenomegaly, lymphadenopathy);
  - Rheumatic fever, infective endocarditis (heart);
  - Poncet's disease (tuberculous lymphadenitis or tuberculous focus at other sites);
  - Chronic tophaceous gout (soft tissue deposits with inflammation; gouty kidney).

Characteristic extra-articular manifestations are very helpful in diagnosis. Most of the inflammatory polyarthritides are chronic with fluctuating course and spontaneous flares. However, several of them may present as acute inflammatory polyarthritis. Thus, rheumatoid arthritis is known to have an explosive onset presenting as acute inflammatory polyarthritis. Classical 'reactive arthritis' of urethritic and/or enteropathic variety (including Reiter's disease) characteristically present as acute inflammatory arthritis with a tendency to evolve into its chronic form. Acute oligoarthritis is a common presentation of psoriatic arthritis. The same is true of polyarticular gout (almost always a man above 40 years of age). Systemic lupus erythematosus as well as severe systemic vasculitis often present with acute inflammatory polyarthritis. Behcet's disease, Lofgren's syndrome (acute sarcoidosis) erythema nodosum syndrome, infective endo-

carditis, acute rheumatic fever, Still's disease and adult-onset Still's disease and Poncet's disease often present as acute inflammatory polyarthritis.

*Is the patient presenting with a chronic non-inflammatory polyarthritis?*

In this category, osteoarthritis (OA), especially the primary generalized nodular variety, is the commonest condition. The involvement of small joints in the hands in a symmetrical fashion may be mistaken for rheumatoid arthritis. However, the elderly age group (always above the age of 50 years) with little constitutional symptoms and absence of features of a systemic inflammatory disease would be strong clinical pointers against inflammatory arthritis. Moreover, the pattern of involvement of hand joints is rather characteristic for OA. Thus, there is prominent involvement of the distal interphalangeal joints often with bony nodule formation (Heberden's nodules). The disease may involve the proximal interphalangeal joints often with bony nodules (Bouchard's nodules). This disease completely spares the metacarpophalangeal (MCP) joints, an important point of distinction from rheumatoid arthritis, which predominantly involves the MCP joints. Most other conditions in this category are uncommon or rare endocrine/metabolic conditions and include hypothyroidism-related joint symptoms, amyloidosis-joint disease, ochronosis, hemochromatosis, and Wilson's disease (the last 3 metabolic conditions presenting as premature OA).

*Is the patient presenting with an acute non-inflammatory polyarthritis?*

This is an interesting question. Is there any such clinical condition? Possibly none. However, somatization problems, fibromyalgia, psychogenic rheumatism and hysterical arthritis may present with 'acute pains' in the MSK without features of any systemic inflammatory disease.

*Is the patient presenting with an inflammatory monoarthritis?*

As mentioned above, an important question that must be addressed right at the outset is whether the patient actually has monoarthritis and not a polyarthritis. It is not uncommon for the patients to complain of pain in one joint

only; the most prominently affected one, without mentioning the minor pains that may have been present in some of the additional joints. Repeated questioning and a careful physical examination is the only sure way not to miss a case of polyarthritis that has been wrongly labeled as a monoarthritis.

Like polyarthritis, depending upon the duration of the symptoms, monoarthritis could also be classified into 2 categories:

- Acute inflammatory monoarthritis (duration < 6 weeks);
- Chronic inflammatory monoarthritis (duration > 6 weeks).

### Acute Inflammatory Monoarthritis

Acute inflammatory monoarthritis is a rheumatological emergency. Making a precise diagnosis urgently is a priority. Delay in instituting appropriate management may prove disastrous. (Note: Be sure that the condition is monoarthritis as careful clinical assessment may show that the patient actually has more than one joint involvement). The presence of the 5 classical signs of acute inflammation (red, hot, tender, swollen and non-functional) makes it easy to put the label 'acute inflammatory' joint disease. Urgent synovial fluid examination in these patients is mandatory. The aspirated synovial fluid must be immediately examined for:

- Crystals (under polarized light microscopy);
- Pathogens (Gram staining and microbial culture);
- White cell count (> 2000/cmm is diagnostic of inflammatory joint disease).

It is to be noted that a high white cell count by itself does not distinguish between the three major causes of inflammatory diseases in the joints (Table 4). It is increased in all the three conditions that cause inflammation in the joint, irrespective of the etiology. Thus, high white cell count in the synovial fluid does not always mean infection. The same is seen in immuno-inflammatory joint disease as well and in crystal deposition joint disease. Probably the commonest cause of acute inflammatory monoarthritis in daily practice is immuno-inflammatory (especially in younger persons and female sex, i.e. monoarticular presentation of rheumatoid arthritis, SLE, psoriasis, reactive arthritis etc.). The second commonest

**Table 4. Three common causes of inflammation in joint(s)**

- Immunological mechanism (autoimmune)
  - Common in <50 age group, women predominate
  - Most of the serious systemic, disabling and life-threatening musculoskeletal diseases belong to this group
- Crystal deposition arthritis
  - Occurs almost exclusively in men above 40 years of age
- Sepsis/infection
  - Uncommon in the joints without a definite underlying cause (e.g. extremes of age, underlying background joint disease, immunocompromized host due to debilitating diseases, drugs, radiation etc., immunodeficiency states etc.)

(Note: Synovial fluid white cell count is high in all these 3 classes of inflammatory joint disease. Therefore, high white-cell count in synovial fluid by itself does not mean sepsis, it is high in other inflammatory conditions as well.)

cause is crystal deposition disease [mainly men above 40 years of age or those with chronic compromised renal function or on drugs (e.g. cyclosporine)]. Septic arthritis is the least common cause of acute monoarthritis. Such individuals usually have a predisposing factor (immunocompromized state) or history of unprotected sexual contact (gonococcal arthritis). However, considering that any delay in the treatment of septic arthritis would quickly lead to joint destruction, it may be prudent to initiate antibiotic treatment empirically before laboratory reports give a definitive diagnosis. Differential diagnosis of acute inflammatory monoarthritis is given in Table 5.

**Table 5. Differential diagnosis of acute monoarthritis**

- A. Acute monoarticular presentation of chronic inflammatory polyarthritis
  - Frequent in psoriatic arthritis
  - May occur in rheumatoid arthritis and other seronegative inflammatory polyarthritides
  - Not uncommon in SLE  
But, it is a 'diagnosis of exclusion'
- B. Crystal arthropathies
  - Gout
  - Pseudo-gout
  - Uncommon ones  
Clinical setting very important: Age and sex, any underlying disease, drugs being taken (diuretics, cyclosporine). Synovial fluid examination decisive for confirming the diagnosis
- C. Septic arthritis
  - Gonococcal: in normal healthy young persons
  - Non-gonococcal: Immunocompromized host or compromised joint(s):
    - e.g. some background joint disease, joint prosthesis, underlying debilitating diseases, immuno-compromized conditions of any type including extremes of age
    - Mostly non-gonococcal (Gram negative infections, anaerobes, and other rare ones – fungal, Borrelia, parasitic etc.)

## Chronic Inflammatory Monoarthritis

This is a small yet important category of arthritis. Tuberculosis, brucellosis, fungal infection and rare parasitic joint infections (guinea worm disease) are some of the causes. The clinical dictum is that in any case of chronic inflammatory polyarthritis synovial fluid microbiology and/or biopsy MUST be performed to get the actual diagnosis. The treatment can then be planned accordingly. No other method of diagnosis is valid for this class of arthritis. (Synovial fluid PCR for *M. tuberculosis* gives inconsistent and unreliable results.) This category also includes many cases with monoarticular presentation of immuno-inflammatory arthritides (e.g. rheumatoid arthritis, psoriatic arthritis, several other seronegative arthropathies etc.). However, this category remains a diagnosis of exclusion. If the synovial fluid microbiological studies and the biopsy fail to show any definitive infective pathology, then the diagnosis of 'idiopathic inflammatory monoarthritis' would be appropriate. The treatment would be intra-articular steroids and synovectomy.

*Is the patient presenting with a non-inflammatory monoarthritis?*

### ACUTE NON-INFLAMMATORY MONOARTHRITIS

Internal derangements, trauma, bleeding in the joint due to any hemorrhagic diathesis (diseases, drugs) and palindromic rheumatism are some of the common causes of non-inflammatory monoarthritis. Careful history and joint aspiration for synovial fluid analysis would help in establishing the diagnosis. An important clinical point is that in hemorrhagic diathesis the large joints, mainly the knee, are affected.

### CHRONIC NON-INFLAMMATORY MONOARTHRITIS

This is one of the least common categories of arthritis. Neuropathic joint disease (Charcot's joint) in tertiary syphilis was common in the past. However, at present, diabetes mellitus with severe peripheral neuropathy is the commonest cause of Charcot's joint, the most common site being the ankle joint. The other relatively uncommon condition causing chronic non-inflammatory monoarthritis is villonodular synovitis. It is a rare non-inflammatory proliferative condition of synovium with depo-

sition of pigment in the tissue. Diagnosis is established by biopsy of the synovium and the treatment is surgical. Rare synovial tumours may also present as a chronic non-inflammatory monoarthritis.

### AVASCULAR NECROSIS OF THE BONE – OSTEONECROSIS

It is a bone disease that may clinically resemble non-inflammatory arthritis. The multi-site osteonecrosis could be confused with a non-inflammatory polyarthritis while that localized to a single site may be a differential diagnosis of non-inflammatory monoarthritis. The list of causes for osteonecrosis is long. However, a history of prolonged steroid intake is probably the most important among them and an important clue its diagnosis. Obviously Cushing's syndrome is one of its causes. It is of interest to note that osteonecrosis is also often seen in rheumatoid arthritis, systemic lupus erythematosus, systemic vasculitis, scleroderma and other collagen-vascular diseases even without steroid therapy. The other causes include trauma (including radiation, thermal and electrical), hemoglobinopathies, coagulopathies, bleeding disorders, alcoholism, pancreatitis, organ transplant, chronic dialysis, hypertriglyceridemia, pregnancy (mainly 3<sup>rd</sup> trimester), sepsis and infections (HIV), rare conditions (decompression syndrome, Gaucher's disease), and idiopathic variety. The distinction of osteonecrosis from actual arthritis may be difficult and may require MRI study to confirm the diagnosis.

### Basic Management Strategy for MSK Diseases

It is beyond the scope of this presentation to discuss the details of treatment for different forms of musculoskeletal diseases discussed above. Only an outline of the management strategies is given below.

### TREATMENT OF LOCAL, REGIONAL OR NON-INFLAMMATORY (MECHANICAL/STRUCTURAL) MUSCULOSKELETAL CONDITIONS; THE SO-CALLED 'GREEN FLAG' MUSCULOSKELETAL DISEASES

This group of conditions mainly requires advice related to the physical conditioning of the body (appropriate diet, weight reduction, general toning of the muscles by aerobic exer-

cises), other physical measures including physiotherapy, occupational therapy, heat, cold and electrical treatments, 'pool therapy' and advice related to change in lifestyle for the protection of joint and musculoskeletal tissue damage in day-to-day use. Other physical devices including orthotic devices may also be necessary in some of these conditions. Medical treatment using drugs is mostly of little or no use in this group of diseases. Occasionally, in certain special situations local injection of corticosteroids may be very useful. Patient education and reassurance that these diseases are, by and large, non-crippling and not life-threatening, goes a long way in making the patients feel better.

#### **TREATMENT OF INFLAMMATORY CONDITIONS; THE SO-CALLED 'RED FLAG' MUSCULOSKELETAL DISEASES**

Unlike local/regional or non-inflammatory rheumatic diseases, inflammatory rheumatic diseases require immediate, often prolonged and complicated regimens of drug therapy. Recent studies have demonstrated that not only acute inflammatory MSK diseases but also, more importantly, chronic inflammatory polyarthritides should be considered a medical emergency.<sup>14,15</sup> This is because permanent joint damage sets in rapidly within a few weeks of the onset of inflammation in the joint and becomes irreversible within the first two years.<sup>16</sup> This has led to strong argument in favor of early aggressive treatment of RA with remission inducing drugs.<sup>14,15,17-20</sup> Delay in initiating remission inducing drugs may lead to poor outcome and permanent joint damage.<sup>17,21</sup> Because of these evidences early aggressive treatment for RA has now become standard practice.<sup>18-20,22-24</sup> Thus, the present day drug treatment protocol for treating inflammatory polyarthritis (prototype rheumatoid arthritis), recommends that if a 12-week course of nonsteroidal anti-inflammatory drugs fails to achieve compete remission, the patient must be referred to a rheumatologist for a detailed evaluation and planning for initiating remission-inducing drugs.<sup>22,25</sup> These include the so-called disease modifying drugs (DMARDs) and the newer biological response modifiers (BRMs), e.g. anti-tumor necrosis factor (anti-TNF) agents and anti-interleukin-1.<sup>22,26</sup> The main DMARDs include methotrexate (the 'anchor drug'), sulfasalazine, leflu-

nomide and hydroxychloroquine.<sup>26,27</sup> These two classes of drugs are often combined to increase their efficacy.<sup>19,20,24,25,28</sup> Till recently, the combinations of DMARDs were mostly chosen on empirical basis. However, recent advances in the molecular basis of the efficacy of these drugs is promising a rational approach to combining DMARDs in the near future.<sup>29</sup> The anti-TNF agents include infliximab, etanercept and adalimumab. A new and very promising new BRM rituximab has recently been reported for inducing prolonged remission in RA.<sup>30</sup> The use of these drugs requires expertise and experience that may not usually be available at the primary care level. Therefore, it is strongly recommended that before the decision to start them (or systemic corticosteroids) is taken the patient must have a rheumatology consultation, preferably within 3 months of the onset of the disease [O'Dell 2004].

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#### **References**

1. Dequeker J, Rasker JJ, Woolf AD. Educational issues in rheumatology. *Baillieres Best Pract Res Clin Rheumatol* 2000;14:715-29.
2. Dequeker J, Rasker H. High prevalence and impact of rheumatic diseases is not reflected in the medical curriculum: The ILAR Undergraduate Medical Education in Rheumatology (UMER) 2000 Project. Together everybody achieves more. *J Rheumatol* 1998;25:1037-40.
3. Smolen JS. Combating the burden of musculoskeletal diseases. *Ann Rheum Dis* 2004;63:329.
4. Freedman KB, Bernstein J. Educational deficiencies in musculoskeletal medicine. *J Bone Joint Surg Am* 2002;84-A:604-8.
5. Freedman KB, Bernstein J. The adequacy of medical school education in musculoskeletal medicine. *J Bone Joint Surg Am* 1998;80:1421-7.
6. Woolf AD, Walsh NE, Akesson K. Global core recommendations for a musculoskeletal undergraduate curriculum. *Ann Rheum Dis* 2004;63:517-24.
7. Rheumawire Report Rheumatalk. *Residents inadequately trained in musculoskeletal medicine*. April 10, 2002. Available from: URL: <http://www.jointandbone.org>

8. Harris Jr ED. The initial evaluation: an approach to rapid diagnosis, In: Harris Jr ED & Genovese MC, editors.. *Primary Care Rheumatology*. Philadelphia: Saunders; 2000: p.13-22.
9. Lipsky's algorithms for the diagnosis and management of musculoskeletal complaints. *Am J Med* 1997;103(6A):51S.
10. Malaviya AN, Kumar A. Polyarthritis: A Clinical Approach. *J Assoc Physicians Ind* 1997;45:55-8.
11. Kumar A. Approach to Arthritis, In: Chaturvedi Col. VP, editor. Souvenir: Rheumatology Update 4-5 August 2001. Delhi Cantt. Department of Rheumatology, Army Hospital (Research & Referral).
12. Doherty M, Abawi J, Pattrick M. Audit of medical inpatient examination: a cry from the joint. *J R Coll Physicians Lond* 1990;24:115-8.
13. Courtney PA, Wright GD. Referrals to an "early synovitis clinic": are they appropriate? *Ann Rheum Dis* 2001;60:991-2.
14. Pincus T. Rheumatoid arthritis: a medical emergency? *Scand J Rheumatol Suppl* 1994;100:21-30.
15. Pincus T, Callahan LF. Remodelling the pyramid or remodelling the paradigms concerning rheumatoid arthritis: lessons from Hodgkin's disease and coronary artery disease. *J Rheumatol* 1990;17:1582-5.
16. Plant MJ, Jones PW, Saklatvala J, Ollier WE, Dawes PT. Patterns of radiological progression in early rheumatoid arthritis: Results of an 8 year prospective study. *J Rheumatol* 1998;25:417-26.
17. McCarty DJ. Suppress rheumatoid arthritis early and leave the pyramid for the Egyptians. *J Rheumatol* 1990;17:1115-8.
18. Mullan RH, Bresnihan B. Disease-modifying anti-rheumatic drug therapy and structural damage in early rheumatoid arthritis. *Clin Exp Rheumatol*. 2003;21(5 Suppl 31):S158 -64.
19. Korpela M, Laasonen L, Hannonen P, Kautiainen H, Leirisalo-Repo M, Hakala M, et al. Retardation of joint damage in patients with early rheumatoid arthritis by initial aggressive treatment with disease-modifying antirheumatic drugs: Five-year experience from the FIN-RACo study. *Arthritis Rheum* 2004;50:2072-81.
20. Wick MC, Anderwald C, Weiss RJ, Imhof H, Kainberger F, Smolen JS. Radiological progression of joint damage in a longitudinal cohort of early DMARD-treated rheumatoid arthritis patients followed for 10 years. *Scand J Rheumatol* 2004;33:162-6.
21. Lard LR, Visser H, Speyer I, vander Horst-Bruinsma IE, Zwinderman AH, Breedveld FC, et al. Early versus delayed treatment in patients with recent-onset rheumatoid arthritis: comparison of two cohorts who received different treatment strategies. *Am J Med* 2001;111:446-51.
22. American College of Rheumatology - Guidelines for the management of rheumatoid arthritis: 2002 Update. *Arthritis Rheum* 2002;46:328-46.
23. O'Dell JR. Treating rheumatoid arthritis early: a window of opportunity? *Arthritis Rheum* 2002; 46:283-5.
24. Gossec L, Dougados M. Combination therapy in early rheumatoid arthritis. *Clin Exp Rheumatol* 2003;21(5 Suppl 31):S174-8.
25. O'Dell JR. Therapeutic Strategies for Rheumatoid Arthritis. *New Engl J Med* 2004;350:2591-602.
26. Olsen NJ, Stein CM. New drugs for rheumatoid arthritis. *N Engl J Med* 2004;350:2167-79.
27. Rahman A, Ahmed S, Underwood M. Disease-modifying drugs in rheumatoid arthritis. *Practitioner* 2001;245:1018-25.
28. Kremer JM, Genovese MC, Cannon GW, Caldwell JR, Cush JJ, Furst DE, et al. Concomitant leflunomide therapy in patients with active rheumatoid arthritis despite stable doses of methotrexate. A randomized, double-blind, placebo-controlled trial. *Ann Intern Med* 2002;137:726-33.
29. Cronstein BN. Therapeutic cocktails for rheumatoid arthritis: Mixmaster's guide. *Arthritis Rheum* 2004;50:2041-3.
30. Edwards JC, Szczepanski L, Szechinski J, Filipowicz-Sosnowska A, Emery P, Close DR, et al. Efficacy of B-cell-targeted therapy with rituximab in patients with rheumatoid arthritis. *New Engl J Med* 2004;350:2572-81.

### CME/CPD Questions

After you have completed reading the article *A patient with musculoskeletal (MSK) pains - clinical approach*, take the test given below. Circle T (True) or F (False) in the answer sheet (page 96) to show the correct answer to each question. Questions 21 to 30 are related to the content in this article.

21. A clinical history of significant early morning stiffness is a feature that is specific for chronic inflammatory polyarthritis.
22. The presence of joint deformity distinguishes chronic inflammatory from non-inflammatory categories of arthritis.
23. A positive test for rheumatoid factor in laboratory investigations in an adult patient with joint symptoms helps distinguish chronic inflammatory from non-inflammatory categories of arthritis.
24. Trauma that causes bleeding in the joints is a recognized etiological factor in the inflammation of joints.
25. X-ray of the affected joint usually establishes the diagnosis of acute inflammatory monoarthritis.
26. The most likely diagnosis of acute inflammatory monoarthritis in a male of over 40 years of age is crystal deposition arthritis (e.g. gout).
27. Refecoxib is an effective disease modifying agent (DMARD) for inflammatory polyarthritis.
28. Joint aspiration and examination of the joint fluid for infection, white cell count and crystals is mandatory immediate diagnostic investigation in acute inflammatory monoarthritis.
29. Inflammatory polyarthritis is classified as chronic if it is of 4 to 5 weeks' duration.
30. Methotrexate is among the main DMARDs used for treating inflammatory polyarthritis.