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Acute Polyarthritis

Acute polyarthritis has a very wide differential diagnosis, presenting significant diagnostic difficulties. Where oligoarthritis (fewer than five joints affected) is the presenting feature, some of the causes of acute monoarthritis must be considered, of which the most important not to miss is septic arthritis (particularly that due to gonococcal infection which may affect several joints).

This article also considers conditions which may cause polyarthralgia which can present in a similar fashion to the inflammatory diseases.

Careful clinical assessment should give a reasonable differential diagnosis which can be further narrowed down by appropriate investigations. Autoantibody tests used to aid diagnosis of rheumatological conditions can be misleading if not considered in the context of the clinical presentation [1]. They are best used to confirm a clinical suspicion, rather than as suggesters of a diagnosis.

Conditions more commonly considered to be chronic and indolent can present floridly in the acute phase. It can take time for a disease to evolve into its classical pattern and for the decision to be reached as to whether it is a chronic condition or a one-off phenomenon. In some cases a definitive diagnosis may never be reached [2].

History

See also separate Aching Joints - Assessment, Investigations and Management in Primary Care and Rheumatological History, Examination and Investigations articles.

- Demographic details such as age, sex, ethnic origin and occupation can give useful diagnostic clues. For example, juvenile idiopathic arthritis is the most common arthritis in children.
- Family history may be present in cases of rheumatoid arthritis (RA), seronegative arthropathies and osteoarthritis (OA).
- Pain is not often discriminatory in diagnostic terms. Speed of onset may help - gout tends to come on abruptly, whereas RA is usually more gradual. Similarly, gout tends to cause very severe, excruciating pain.
- Diurnal variation of symptoms may give useful clues. An inflammatory arthritis tends to be worse on waking and eases as the day goes on. Mechanical pain tends to have the opposite effect.
- Ask about morning stiffness and joint swelling.
- Migratory arthritis (flitting from joint to joint over a period of days) might suggest gonococcal infection, rheumatic fever (RF), sarcoidosis, systemic lupus erythematosus (SLE), Lyme disease or bacterial endocarditis.
- Pattern of joint involvement is very useful in suggesting a diagnosis. For example:
    - OA of the hand affects the distal interphalangeal (DIP) and proximal interphalangeal (PIP) joints but spares the metacarpophalangeal (MCP) joints.
    - RA affects the MCP and PIP joints but spares the DIP joints.
    - Psoriatic arthritis, crystal arthropathies and sarcoidosis can affect all these joints.
    - Large weight-bearing joints and facet joints of the spine are often affected by OA.
    - Axial involvement in younger patients suggests a seronegative arthropathy such as ankylosing spondylitis or inflammatory bowel disease-associated arthropathy.

- Symmetrical joint involvement tends to occur in systemic syndromes such as RA, SLE, viral arthritis and drug/serum sickness reactions.
- In asymmetrical joint involvement consider gout, psoriatic arthritis and reactive arthritis.
- Extra-articular symptoms should be asked about and can aid diagnosis. The eyes, parotid glands, skin, mouth, genitals and muscles can all be affected by rheumatological diagnoses.
- Take a full drug history - some drugs (eg, hydralazine, procainamide, quinidine and minocycline) can cause a lupus-like syndrome [3] and there have been reports of a variety of drugs associated with polyarthralgia (eg, moxifloxacin) [4].
- Systemic symptoms should also be sought - eg, fever and weight loss [5].
- Note whether there any other associated presenting symptoms - eg, abdominal or respiratory disease.

Examination

- Check temperature.
- Nail changes (eg, pitting) may suggest psoriatic arthropathy.
- Look at the eyes for signs of inflammation.
- Check major lymph nodes for evidence of lymphadenopathy.
- Check the skin for rashes (eg, psoriasis, SLE) and evidence of vasculitis. Feel extensor aspects of forearms for nodules. Check shins for evidence of erythema nodosum.
- Cardiac examination - listen for murmurs if there is reason to suspect RF.
- Abdominal examination - may reveal evidence of hepatomegaly and/or splenomegaly.
- Examine other systems as indicated by the history and clinical hypotheses.

- Joint examination:
    - Look for signs of inflammation in the joint, such as heat, tenderness and synovial thickening.
    - Establish whether there are symmetrical or asymmetrical joints involved.
    - Active and passive movements of affected joints and the degree of pain and/or crepitus may also be helpful. However, crepitus and pain will not differentiate between inflammatory and non-inflammatory causes of joint pain. They may, however, give some indication as to the degree of damage.
    - Also examine the structures around the joint and determine if the symptoms are intra-articular or periarticular.

Discriminating features of common causes of polyarthritis [2]

	Development over time	Inflammation	Pattern joint involvement	Symmetry	Axial involvement	Extra-articular manifestations/other features
Rheumatoid arthritis (RA)	Chronic	Yes	Small and large joints	Yes	Neck	Nodules
Osteoarthritis (OA)	Chronic	No	Weight-bearing joints, proximal interphalangeal (PIP) joint, distal interphalangeal (DIP) joint, first carpometacarpal (CMC) joint	Variable	Neck and lower back	None, Heberden's nodes (distal) and Bouchard's nodes (proximal)
Systemic lupus erythematosus (SLE)	Chronic	Yes	Small joints	Yes	No	Malar rash, mouth ulcers, pleuritis, pericarditis
Psoriatic arthritis	Chronic	Yes	Large and small joints	Variable	Variable	Psoriatic rash, dactylitis, nail changes, tendonopathy
Human parvovirus B19 infection	Acute and remitting	Yes	Small joints	Yes	No	Lacy rash, malar rash
Ankylosing spondylitis	Chronic	Yes	Large joints	Yes	Yes	Iritis, aortic regurgitation, tendonopathy

Differential diagnosis

The diagnoses below are not exhaustive but cover the vast majority of causes of polyarthritis.

Differential diagnosis	
Viral infections [6] • Parvovirus B19 • Enteroviruses • Adenoviruses • Epstein-Barr virus • Coxsackievirus • Cytomegalovirus • Hepatitis viruses [7] - especially B • Mumps • Rubella • HIV	**Direct bacterial infections** • Gonococcal infection • *Staphylococcus aureus* • Streptococci • Gram-negative organisms • Bacterial endocarditis
Other infections • Lyme disease (*Borrelia burgdorferi*) • Tuberculosis (mycobacterial) • Fungal infection • Weil's disease (leptospirosis) • Whipple's disease (*Tropheryma whippelii*)	**Reactive to bacterial infection** • Gonococcal infection • *Campylobacter* spp. • *Chlamydia* spp. • *Salmonella* spp. • *Shigella* spp. • *Yersinia* spp. • Rheumatic fever (RF) - group A streptococci • Reactive arthritis
Crystal arthropathy/metabolic disease • Gout (urate) • Pseudogout (calcium pyrophosphate) • Hydroxyapatite • Wilson's disease • Haemochromatosis • Amyloidosis • Hyperlipidaemia • Multicentric reticulohistiocytosis • Alkaptonuria	**Systemic rheumatological disease** • Rheumatoid arthritis (RA) • Systemic lupus erythematosus (SLE) • Polymyositis/dermatomyositis • Juvenile idiopathic arthritis • Scleroderma • Sjögren's syndrome • Behçet's disease • Familial Mediterranean fever • Fibromyalgia
Systemic vasculitic disease • Vasculitis - eg, Henoch-Schönlein purpura • Polyarteritis nodosa • Granulomatosis with polyangiitis (Wegener's granulomatosis) • Giant cell arteritis • Hypersensitivity vasculitis	**Spondyloarthropathies** • Ankylosing spondylitis • Psoriatic arthritis • Enteropathic arthropathy (inflammatory bowel disease-associated)
Endocrine disease • Hyperparathyroidism • Hyperthyroidism • Hypothyroidism • Acromegaly	**Malignancy** • Metastatic cancer • Multiple myeloma
Degenerative/structural • Primary generalised (erosive) osteoarthritis (OA) • Secondary osteoarthritis • Neuropathic joints	**Miscellaneous** • Sarcoidosis • Fibromyalgia • Hypertrophic pulmonary osteoarthropathy • Hypermobility syndromes (eg, Ehlers-Danlos syndrome or Marfan's syndrome) • Osteomalacia • Drug/serum reactions • Polymyalgia rheumatica • Sweet's syndrome • Palindromic rheumatism

Investigations

Where there is any suspicion of septic arthritis, immediate aspiration of synovial fluid should be carried out. Synovial fluid analysis may play a role in diagnosis of crystal arthropathies and inflammatory conditions but results need to be carefully interpreted in context. The table below shows the findings in the more common causes of arthritis:

Synovial fluid changes in common causes of monoarthritis [9]	
Normal	• Appearance: clear, viscous fluid • WBC count (cells per 10^{-6}/L): 0-200 • Crystals: nil • Culture: sterile
Septic arthritis	• Appearance: turbid, low viscosity • WBC count (cells per 10^{-6}/L): 50,000-200,000 neutrophils • Crystals: nil • Culture: positive (in some cases)
Gout (uric acid)	• Appearance: clear, low viscosity • WBC count (cells per 10^{-6}/L): 500-200,000 neutrophils • Crystals: needle-shaped and negatively birefringent • Culture: sterile
Pseudogout (pyrophosphate)	• Appearance: clear, low viscosity • WBC count (cells per 10^{-6}/L): 500-10,000 neutrophils • Crystals: block-shaped and positively birefringent • Culture: sterile
Inflammatory - eg, rheumatoid arthritis	• Appearance: turbid, yellowish-green (chicken soup), low viscosity • WBC count (cells per 10^{-6}/L): 2,000-100,000 neutrophils • Crystals: nil • Culture: sterile
Osteoarthritis/injury	• Appearance: large volume, normal viscosity, may be blood-stained if trauma/haemarthrosis • WBC count (cells per 10^{-6}/L): 0-2,000 mononuclear • Crystals: usually none (5% have pyrophosphate crystals) • Culture: sterile

- Urinalysis - indicates any renal involvement.
- Blood tests - FBC, ESR, CRP and U&E are useful screening investigations which give diagnostic clues.
- Autoantibodies - can help to confirm a diagnosis but are often relatively nonspecific or insensitive [2]. They should be interpreted in the context of the clinical presentation, preferably with specialised rheumatological input for the less common markers.
- Radiology - X-rays play a variable role in their contribution to diagnosis but are a useful first-line investigation. Other imaging modalities may need to be conducted with rheumatological/radiological advice.
- Joint aspiration is helpful in the differential diagnosis of arthritis and is the definitive method for diagnosis of septic arthritis and crystal arthritis [8].

Management

Directed at the underlying diagnosis. See the links to the individual diagnoses for detail.

Symptomatic treatment of inflammatory conditions with non-steroidal anti-inflammatory drugs should be considered whilst awaiting the evolution of an arthritis, where there are no contra-indications or significant drug interactions.

Where there is a significant inflammatory illness as revealed by clinical severity and CRP/ESR, etc, early advice for disease-modifying interventions can significantly reduce joint pathology in some conditions.

If in doubt, seek advice on the appropriate course.

Further reading & references

- Rheumatoid arthritis in adults: management; NICE Clinical Guideline (February 2009)
- Osteoarthritis: care and management in adults; NICE Clinical Guideline (February 2014)
- Management of early rheumatoid arthritis; Scottish Intercollegiate Guidelines Network - SIGN (February 2011)

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