

The acute hot joint in medical practice

ABSTRACT—We have studied patients with acute hot joints presenting to general practice, casualty and inpatient rheumatology services. Their investigation, management and outcome were measured against guidelines. Different spectra of disease were seen in the different health care settings. The guidelines were not adhered to for crystal arthritis, particularly when it affected the first metatarso-phalangeal joints. The guidelines were broadly adhered to and useful for other joints, especially where septic arthritis was considered to be the likely diagnosis. We found no benefit on outcome from adhering to the guidelines. There was a tendency for the outcome to be worse where the guidelines were followed in full, suggesting that more investigations are performed in the more difficult cases. We conclude that drawing up guidelines for patient management is difficult even in an area where there is broad medical agreement.

The British Society for Rheumatology (BSR) and Royal College of Physicians (RCP) have produced guidelines for the management of the acute hot joint [1]. Our aim was to test these guidelines in practice in different settings. The guidelines include standards of investigation and treatment against which management may be judged and a suggestion as to outcome measures that may be useful in auditing these standards. Table 1 summarises these guidelines. A recent study of septic arthritis in rheumatological practice suggested that these guidelines were useful and broadly adhered to [2].

Awaking one morning with an acutely painful, swollen joint, most people would probably take themselves to their general practitioner (GP) or to a hospital casualty department. Only a small proportion will ultimately be seen by a rheumatologist and even fewer will be admitted to a rheumatology ward. We have, therefore, studied the presentation of acute hot joints in general practice, casualty and to rheumatology inpatient services. Further, we have measured the management against the guidelines in order to assess both the management and the usefulness and practicability of the guidelines.

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Table 1. Recommendations for management of acute hot joint.

Structure
Prompt assessment by experienced clinician
Investigations
Microscopy, including polarising microscopy of synovial fluid
Gram stain and culture of synovial fluid
Blood culture
Full blood count
Measures of acute phase reaction (eg ESR and C-reactive protein)
Joint x-rays
Treatment
Appropriate to diagnosis and responding to investigations
Outcome measures
Death
Joint destruction
Disseminated infection
Length of hospital stay

Methods

Study 1: general practice

A general practice with good computerised records was chosen. This practice covers a mixture of a market town and a rural area and has a total of 13,434 registered patients. Every consultation made over the past few years has been entered on to a computer system. There were 3,458 consultations during the study period. A search was made on 'Read codes' for gout, rheumatoid arthritis, pyogenic arthritis and haemarthrosis; the records were then reviewed to assess which of these patients had presented with an acute hot joint. From the records we extracted information on diagnosis, investigations performed, management and outcome. A questionnaire was sent to these patients at the time of study to ascertain information on subsequent course, satisfaction and outcome. After the initial study, a further search was made of all the practice records for cases of haemarthrosis and septic arthritis.

Study 2: casualty

Cards at a district general hospital casualty department over a period of six months were reviewed by IY,

looking for patients who had presented with acute pain and swelling of a joint. Information was extracted on diagnosis, investigations, management and outcomes. A questionnaire was sent to patients seeking information on the subsequent course of the problem.

Study 3: rheumatology inpatients

Discharge summaries from a subregional rheumatology ward, held on a computerised medical audit system, were searched for patients with septic arthritis, haemarthrosis, gout and anyone else presenting with an acute hot joint, and the notes reviewed to ascertain diagnosis, investigations, management, outcomes and subsequent course.

Results

Study 1: general practice

Twenty-one patients were found presenting with an acute hot joint. All were diagnosed as suffering from acute gout; in seven of them gout had previously been diagnosed. Twenty subjects presented with pain in the first metatarso-phalangeal (MTP) joint, one of them also had ankle pain and one presented with knee pain. No patient's diagnosis was subsequently changed. Details of these patients appear in Table 2, along with the crystal arthritis patients from the other populations.

Process—In no case were the recommended guidelines followed. The patient with knee involvement was the only one to be referred to hospital and this was a routine referral to the orthopaedic department.

Serum uric acid estimations were performed in 14

of the patients; three had had previous uric acid estimations and four had none at all. No patient's joint was aspirated. A presumptive diagnosis of gout was made in all cases and all but one were treated with anti-inflammatory drugs. The one patient not so treated was appropriately treated with co-proxamol. In 17 patients discussion of long-term management was recorded in the notes.

Outcome—None of the guidelines' outcomes (ie death, degree of joint destruction, disseminated infection, length of hospital stay) were appropriate to this population. Only two patients had further attacks of gout during a follow-up period averaging 16 months (range five to 28 months); neither of them was taking allopurinol but both had discussed its use.

The search of the computer records for the whole practice produced only three cases of septic arthritis and four of haemarthrosis; they had all been appropriately referred.

Study 2: casualty

Over the six months period, 31 patients attended casualty with an acute hot joint. A further 16 had an infective bursitis which is therefore a major differential diagnosis of acute hot joint in casualty departments. Of the 31 with acute arthritis, nine were suffering from gout (six occurred in the first MTP joints, two in knees and one in the ankle), two from septic arthritis, two from acute trauma; the remaining 18 were labelled as acute exacerbation of osteoarthritis, acute inflammatory arthritis or with no specific diagnosis.

Gout—Table 2 shows how far the criteria for investigation and treatment of gout were achieved. Joint aspiration was performed in only one patient; none were

Table 2. Management of patients with crystal arthritis from the different studies.

	Source of patient							
	General practitioner: gout (n = 21)		Casualty: gout (n = 9)		Rheumatology inpatient: gout (n = 9)		Pyrophosphate (n = 8)	
	Yes	No	Yes	No	Yes	No	Yes	No
First MTP	20	1	6	3	1	8	0	8
Investigation								
Aspiration	0	21	1	8	6	3	8	0
X-ray	0	21	5	4	8	1	8	0
FBC/ESR	1	20	2	7	9	0	6	2
Blood culture	0	21	0	9	2	7	5	3
Urate	14	7	6	3	9	0	8	0
Treatment								
NSAID	20	1	8	1	9	0	8	0
Advice	17	4	8	1	9	0	8	0

admitted to hospital. The average delay from onset of symptoms to presentation at the casualty department was 40 hours, with a range from eight hours to seven days.

Septic arthritis—Two cases of septic arthritis were found; both occurred in knees and both were admitted to hospital. Details of these are shown in Table 3, along with the cases of septic arthritis from the ward. The delay from onset of symptoms to presentation was two days for one patient and 15 days for the other; for one, the delay between presentation and diagnosis was two days and three days for the other. The outcome was the same for both patients. There was no dissemination of infection in either patient.

Other diagnoses—Both traumatic problems concerned knees; they were x-rayed but not further investigated. In the other 18 patients, knees were involved in 13, ankles in three, the wrist in one and the MTP joint in one. Table 4 shows the investigations and treatment undertaken in these patients. Most had x-rays, but aspiration of the joint was unusual. The delay from onset of symptoms to presentation averaged 43 hours (range two hours to five days). Advice was usually documented as having been given.

Seventeen of the 18 patients without a satisfactory diagnosis were sent a questionnaire after a period averaging eight months (range four to 12 months). None returned for medical attention with an alternative diagnosis.

Study 3: inpatients

Thirty-six patients were admitted to the rheumatology ward with an acute hot joint: 13 were diagnosed as septic arthritis (Table 3), nine as gout (Table 2), two as reactive arthritis, four as haemarthrosis and eight as pyrophosphate arthritis (Table 2).

Crystal arthritis—In this population, gout occurred in an unusual combination of joints: ankles, knees and elbows. Investigations and treatments are shown in Table 2. There were fewer failures to comply with the guidelines in this population than in the others, though no blood cultures were done in seven patients. The average delay from onset of symptoms to presentation was five days (range 1 to 14 days). The average hospital stay was eight days.

Pyrophosphate arthritis was diagnosed in eight patients (Table 2). Again the average delay to presentation was five days. Average hospital stay was 11 days. Five fulfilled the criteria completely.

Septic arthritis—Of the 13 patients with septic arthritis, infection was in the knees in six, in elbows in two, in the shoulders in three and in the first MTP joints in two. Only two had no pre-existing disease, five were known rheumatoid arthritis sufferers, one had psoriatic arthritis, two suffered from osteoarthritis and one from scleroderma and had recently had the attention

Table 3. Management of patients with septic arthritis from the different studies.

	Casualty		Rheumatology inpatient (n = 13)	
	Yes	No	Yes	No
Investigation				
Aspiration	2	0	13	0
Polarising microscopy	0	2	9	4
FBC/ESR	2	0	13	0
Blood culture	1	1	10	3
X-ray	2	0	13	0
Diagnosis				
Within 24 hours	0	2	12	1
Treatment				
Antibiotics within 24 hours	2	0	12	1
Disseminate infection	0	2	3	10
Death	0	2	0	13
First MTP n = 2				

of a chiropodist. Investigations and treatment are shown in Table 3. Eight of the 13 fulfilled the criteria completely although there was a delay in one patient. The average delay from onset of symptoms to presentation averaged eight days (range 1 to 35). Length of stay in those fulfilling the criteria averaged 20 days (range 4 to 52), and 16 days (range 4 to 24) in those not fulfilling the criteria.

Appropriate antibiotics were used in all cases. There were no deaths. Disseminated infection occurred in three patients.

Other diagnoses—Reactive arthritis was the diagnosis in two patients. Average delay from onset of symptoms to presentation was 16 days. Hospital stay was 11 days. One patient completed the criteria. There were four

Table 4. Management of casualty patients where no satisfactory diagnosis was made (n = 18).

Investigation		X-ray		FBC/ESR		Blood culture		Urate	
Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
3	15	17	1	4	14	0	18	2	16
Treatment		NSAID		Advice					
Yes	No	Yes	No						
10	8	12	6						

patients with haemarthrosis, two of them in knees, one had a sporting injury, the other had pre-existing osteoarthritis; two occurred in anticoagulated patients. Two of the patients had neither blood cultures nor culture of the joint aspirate.

Discussion

Managers in the NHS hope that by setting guidelines and minimum standards for good clinical practice, they will be able to measure actual performance in these situations [3]. But this may be too simplistic a view [4].

The guidelines on the acute hot joint were produced by a working party of the BSR and the RCP. The acute hot joint was probably chosen as an area in which it was most likely possible to achieve a consensus on how it should be managed. The published guidelines do seem to be a sensible attempt in principle, but to be useful they must be tested in clinical practice to see if they are practical, relevant and result in a better outcome for the patient.

In this study we have tried to cover the different ways in which patients may present to medical services. The results show a wide spectrum in the presentation of diseases in different settings. In particular, gout, as seen in general practice, is nearly all pain in the first MTP, in casualty there is a mixture and in hospital rheumatology practice it is only patients with gout in unusual joints who are admitted. It is therefore likely that different guidelines are needed for different clinical situations. Similarly, in casualty practice, infective bursitis seems to be a major differential diagnostic problem and guidelines for casualty departments should take account of this. It is, however, fair to note that pyrophosphate arthritis can only be diagnosed after aspiration of the joint and would not have been diagnosed other than in inpatient rheumatology practice.

The different methods of searching for patients were determined by what could be done locally and are not entirely comparable. The definition of how acute is acute and how hot is hot also tends to confound this area of research and may influence management. Some of the patients attending casualty seem simply to have wanted no more than their joint to be witnessed medically.

This study has also raised some potential problems in clinical management. In the inpatient rheumat-

ology group, two of the haemarthrosis aspirates were not cultured and there was also a tendency not to do blood cultures if a confident diagnosis had already been made. While none of these omissions produced an adverse event, they do leave the possibility that a septic arthritis might have been missed or not optimally treated. Patients from casualty in whom no satisfactory diagnosis had been made are the most worrying group. Staff in casualty departments tended to depend on x-ray results for making a diagnosis rather than on aspiration of joints; fortunately no disasters due to missed septic arthritis were encountered.

Similarly, management of pain in the first MTP by the GP seems to have worked satisfactorily. The only cases of septic arthritis in the first MTP joints were secondary to other problems and so the risk of missing infection in the first MTP joint in general practice seems to be small.

Overall, with the exception of the first MTP joint, the guidelines for investigation and management appear to be sound and could be adhered to with benefit; but the suggested outcome measures did not prove useful. Length of hospital stay is confounded by many other factors and following the guidelines in full tended to be associated with a longer length of stay. Similarly, disseminated infection as an outcome measure was not useful in this population, though it may be in a bigger study restricted to the management of septic arthritis. The greatest surprise finding in all these groups was how long it took for patients to seek medical attention after the onset of symptoms. If this delay were shown to be associated with adverse outcome, then patients would need to be made more aware of this.

References

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