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Pyogenic infection and rheumatoid arthritis

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Summary: Ten episodes of severe pyogenic infection occurring in nine patients with rheumatoid arthritis are reported. There was a wide range of presenting features including pyoarthrosis in 7 episodes. Three cases presented with meningitis, bacterial endocarditis and probable multiple abscesses respectively. Infection was caused by *Staphylococcus aureus* in 7 episodes and by *Staphylococcus epidermidis*, *Streptococcus pneumoniae* and β-haemolytic *Streptococcus* in each of one episode. Three infective episodes were fatal. Pyogenic, especially staphylococcal, infection should be considered in patients with rheumatoid arthritis with unexplained illness with or without sudden deterioration in joint symptoms. It is important to recognize and treat infection rapidly.

Introduction

Patients with rheumatoid arthritis are especially susceptible to acute pyoarthroses or other pyogenic infections, predominantly due to staphylococci.[1] In some patients the classical features of infection in joints may be masked by the presence of active synovitis. In others, however, severe life-threatening infection may occur in the absence of specific joint symptoms or of leucocytosis or pyrexia. We investigated the presenting clinical features, the nature of the infecting bacterium and the mortality in ten episodes of severe pyogenic infection occurring in patients with rheumatoid arthritis treated in our hospital within the last 4 years.

Cases

Clinical details of the cases are summarized in Table I.

Discussion

Acute septic arthritis, usually due to *Staphylococcus aureus* is a well documented complication of rheumatoid arthritis,[1] over 100 cases being reported in the literature[2] since the first report by Kellgren *et al.* in 1958.[3] Mortality can be as high as 30%, although this may be reduced if treatment is initiated early.[4] Some cases are, however, unrecognized.[2] The clinical features of pyoarthrosis may be impossible to distinguish from those of an exacerbation of rheumatoid arthritis or may be accompanied by no pyrexia or significant leucocytosis, as confirmed in our cases, seven of which presented with septic arthritis. It is therefore of importance to recognize and treat this complication quickly and patients with acute onset of joint inflammation should be encouraged to seek medical advice as soon as possible and, if appropriate, joint aspiration should be undertaken. Although not always positive, especially if antibiotics have already been administered Gram staining of synovial fluid is a useful emergency procedure giving an almost immediate result which may help to guide management well before results of cultures become available. If microbiological facilities are not immediately available, in many cases it may be necessary to start patients on antibiotics including anti-staphylococcal agents while awaiting results of culture.

Staphylococci account for over 80% of cases of pyoarthrosis in rheumatoid arthritis.[2] Joint infection due to β-haemolytic *Streptococcus* (Case 8) has been reported in a single case previously.[5] Pyoarthrosis caused by *Streptococcus pneumoniae* has not been reported previously (Case 4) and was probably also the cause of a pneumonia in this patient. No patients with pyoarthrosis had a recent history of joint trauma, aspiration or steroid injection. Three patients (Cases 1, 8, 9) had long-standing skin ulceration perhaps allowing a portal of entry for bacteria subsequently infecting joints. Good skin care is therefore very important in patients with rheumatoid arthritis and particular attention should be paid to pressure areas in immobile patients. As more joint replacements are being inserted infection in prostheses is becoming an increasing problem. Infection may occur many months or years after replacement as illustrated in Case 5.

In other patients with rheumatoid arthritis, pyogenic

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Table 1 Clinical features of 10 episodes of pyogenic infection in 9 patients with rheumatoid arthritis.

Case no	*Age*	*Sex*	*RF*	*Current drugs at presentation*		*Clinical presentation*	*Presentation*		*Organism*	*Blood cult*	*Other + ve cultures*	*Survival*
				Steroids	*Others*		*T°C*	*WBC × 10^9/l*				
1	72	M	+	No	NSAID	Confusion, painful R knee. Ulcer R foot	37.7	10.0	*Staph. aureus*	+	R knee	Yes
2	70	F	+	Yes	NSAID Chloroquine	Generalized joint pain, especially neck and L ankle	37.0	12.0	*Staph. aureus*	+	csf	No
3	68	F	−	No	NSAID Penicillamine	Confusion, back pain, tender in R hypochondrium	40.0	9.6	*Staph. aureus*	+		Yes
4	60	M	+	Yes	NSAID	Rigors, painful R knee, pneumonia	38.8	19.0	*Strep. pneumoniae*	+	R knee	Yes
5	72	F	−	Yes	−	Painful R elbow (prosthetic joint for 18 months)	37.0	9.9	*Staph. epidermidis*	−	R elbow	Yes (prosthesis not removed)
6A	64	F	+	No	NSAID	Rigors, malaise, painful R elbow	37.0	4.4	*Staph. aureus*	+	R elbow	Yes
6B	77	F	+	No	NSAID	Confused, feverish, incontinent, new pan-systolic murmur (BE)	37.4	16.7	*Staph. aureus*	+		No (PM confirmed vegetations mitral and aortic valve)
7	76	F	+	No	NSAID	Back pain, pain in wrist and hands	37.7	14.1	*Staph. aureus*	+	R pipj, mcpj, wrist both knees/hips	No
8	55	F	+	No	NSAID	Confusion, dehydration, painful R knee, sacral ulcer	39.0	5.0	*Streptococcus* (β-haemolytic)	+	R knee	Yes
9	67	F	+	No	NSAID	Painful R knee, rigors, Ulcers feet for 2 years	37.0	11.4	*Staph. aureus*	+	R knee	Yes

Abbreviations: BE, bacterial endocarditis; csf, cerebrospinal fluid; mcpj, metacarpophalangeal joints; NSAID, non-steroidal anti-inflammatory drug; pipj, proximal interphalangeal joints; PM, post-mortem; RF, rheumatoid factor.

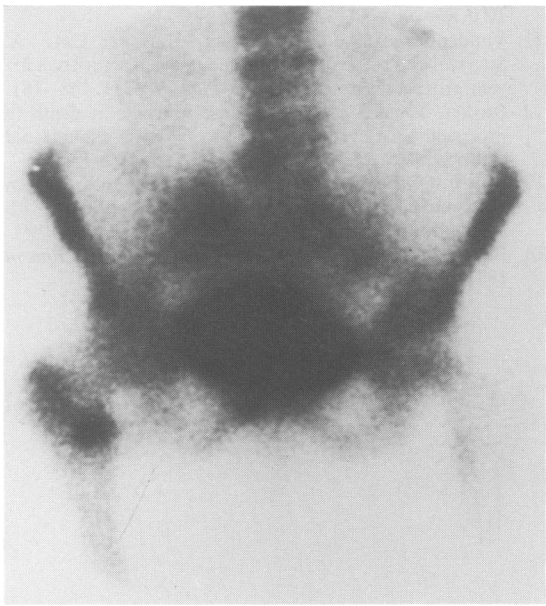

Figure 1 Tc^{99m} bone scan of pelvis showing increased isotope uptake in the right lesser trochanter and patchy uptake in relation to the lumbar spine and sacroiliac joints (Case 3).

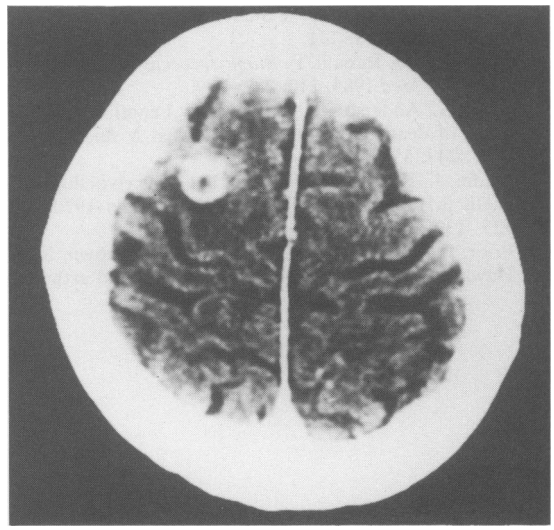

Figure 2 Brain CT scan showing a lesion compatible with a cerebral abscess in the left posterior frontal region (Case 3).

infection may present in unusual ways.[6] In three of our patients infection presented with features other than pyoarthrosis. In case 2, the presence of neck pain with limitation of movement, although not an uncommon feature of rheumatoid arthritis, together with the other clinical features, raised the possibility of meningitis which was confirmed by lumbar puncture. Staphylococcal meningitis is an uncommon but extremely severe illness[7] and has not to our knowledge been previously reported in association with rheumatoid arthritis. Case 3 presented with features suggesting acute cholecystitis, and although the cause of abdominal pain was not found in this case, it appears that the patient had staphylococcal abscesses in the brain and possibly also in the lesser trochanter (Figures 1 and 2), joints of the axial skeleton and the abdomen. Case 6 presented with evidence of endocarditis confirmed as being due to *Staphylococcus aureus*.

Several studies have shown an increased death rate from infection in rheumatoid arthritis[8–13] and suggest that patients may have an increased susceptibility to infections. The precise mechanisms underlying such increased susceptibility remain, however, to be elucidated and may result from a primary defect of the immune system in rheumatoid arthritis, an acquired defect of the immune response or a non-specific decrease in resistance to infection associated with chronic disease.[14] It is of interest that only one (Case 9) out of three (Cases 1, 3, 9) of our patients investigated with staphylococcal infection developed significant increase in antistaphylolysin titres following infection. The possible contribution of steroids or other immunosuppressive agents in predisposing to infection is also unclear[3]. The possibility of infection should, however, always be considered in patients with rheumatoid arthritis presenting with a deterioration in joint symptoms or other unexplained illness.

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