Case Report

Acute rheumatic fever: an important differential diagnosis of septic arthritis

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Summary

We present three cases of suspected septic arthritis in which the joint fluid was sterile. Subsequently all three patients were diagnosed with established moderate-severe rheumatic heart disease. In retrospect it is likely that the earlier presentations were in fact episodes of acute rheumatic fever but were not recognized as such. These cases underline the importance of acute rheumatic fever as a differential diagnosis of septic arthritis when the joint fluid is sterile, particularly in regions where there are high rates of acute rheumatic fever and rheumatic heart disease.

Key words: acute rheumatic fever, septic arthritis, rheumatic heart disease.

Case 1

In November 2003, an 8-year-old Fijian boy was referred from a peripheral health center to the Colonial War Memorial Hospital in Suva, Fiji Islands, with right hip pain and fever. On examination he had a temperature of 38.5°C, and markedly reduced range of movement of the right hip. Cardiac examination was recorded in the notes as normal. Blood investigations at this time revealed an elevated erythrocyte sedimentation rate (ESR) of 75 mm/h and a normal peripheral white blood cell count (WCC). C-reactive protein is not measured at our hospital. An X-ray of the affected hip was normal. A diagnosis of septic arthritis of the right hip was made and arthrotomy was performed. Turbid fluid was drained from the hip—Gram stain revealed white blood cells but no organisms; a formal white cell count was not reported and there was no growth on culture of the fluid. A blood culture taken at admission was negative. He was treated with intravenous cloxacillin for 6 days and then oral flucloxacillin for a further 8 days which is shorter than the recommended duration of oral antibiotic therapy for septic arthritis in Fiji.

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In January 2007, he presented with left hip pain. He was afebrile and on examination of the right hip there was reduced range of movement. He was noted to have a grade 4 diastolic murmur heard loudest at the base of the heart and radiating to the carotids. An echocardiogram confirmed that he had severe aortic incompetence as well as thickening of both mitral valve leaflets. The ESR was 32 mm/h and a single anti-streptolysin O titre (ASOT) was 595 IU/ml. Anti-DNase B titres are not measured at our hospital. A diagnosis of acute rheumatic fever was made and he was commenced on enalapril and prophylactic benzathine penicillin G.

Case 2

In November 2003, a 9-year-old Fijian boy presented to the emergency department at the Colonial War Memorial Hospital with fever and pain and swelling of the right hip and ankle for 4 weeks. Further history revealed that he had been admitted with septic arthritis of the right knee 3 years prior but the medical notes for this admission were not available. On examination, he was febrile with a temperature of 38.2°C. There was marked reduction in the range of movement of the right hip, and the right ankle was warm, tender and swollen. Cardiac examination was recorded in the notes as normal. The ESR was 55 mm/h and the WCC was elevated at 19×10^9/l. X-rays of both joints were normal. A diagnosis of septic arthritis of the right hip and ankle was

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made and washout of both joints was performed. At arthrotomy, both joints were found to contain turbid fluid. Polymorphonuclear cells were noted on microscopy but a formal white cell count was not reported and no organism was cultured from either joint. Blood cultures taken at admission were also negative. The child was treated with parenteral-oral sequential cloxacillin for 2 weeks and recovered fully.

In January 2007, he presented with fever, shortness of breath, reduced appetite and lethargy for 1 month. On examination he was febrile, and in cardiac failure. Cardiac examination revealed a grade 4 pansystolic murmur heard loudest at the apex and radiating over the entire praecordium. An echocardiogram showed moderate mitral regurgitation with a dilated left atrium and left ventricle. The ESR was 36 mm/h, the white cell count was normal and an ASOT was 410 IU/ml. A diagnosis of acute rheumatic fever was made and he was commenced on frusemide and prophylactic benzathine penicillin G.

Case 3

In February 2005, a 10-year-old Fijian girl was referred to the Colonial War Memorial Hospital with fever and left knee and ankle pain. On examination her temperature was 39°C and she appeared unwell. She had clinical evidence of left knee and ankle arthritis. Cardiac examination was recorded as normal. Blood investigations at this time revealed an elevated ESR of 123 mm/h and a normal WCC. She was diagnosed with septic arthritis of the left knee and ankle, and an aspirate of the left knee was performed prior to the commencement of antibiotics. The joint fluid was turbid in appearance and microscopy revealed a white cell count of 5400 cells/mm^3 with 81% neutrophils. No organism was isolated from the fluid and there was also no growth from blood cultures. She was treated with parenteral-oral sequential cloxacillin for a total of 2 weeks and recovered fully.

In April 2006, she was seen by a rheumatic heart disease school screening team. The team noted a grade 4 pansystolic murmur heard loudest at the apex and a grade 4 diastolic murmur heard loudest at the base. An echocardiogram confirmed that she had severe mitral regurgitation and severe aortic regurgitation with an enlarged left atrium and left ventricle. Further history revealed that she had been experiencing progressive dyspnoea over the preceding 2 years. She was diagnosed with rheumatic heart disease and commenced on enalapril, frusemide and prophylactic benzathine penicillin G.

Discussion

These three cases underline the importance, in countries where acute rheumatic fever and rheumatic heart disease are common, of considering acute rheumatic fever as a differential diagnosis in children with suspected septic arthritis when the joint fluid is sterile. It is likely that the initial presentations described for all three children were in fact presentations of acute rheumatic fever rather than septic arthritis with sterile synovial fluid cultures. If an earlier diagnosis of acute rheumatic fever had have been made and secondary prophylaxis been started it is likely that all of these children would have avoided moderate to severe rheumatic heart disease. Instead they all may require cardiac surgery in adolescence.

Of course, we cannot be sure of the retrospective diagnosis of acute rheumatic fever. The diagnosis may well have been septic arthritis; the culture rate from synovial fluid in suspected septic arthritis has a wide range with reports of as low as 16% [1]. Another important diagnosis to consider is transient synovitis. However, all three children, when eventually diagnosed with rheumatic heart disease, had moderate to severe valvular disease, and so it is likely that they had at least one episode of rheumatic fever prior to the diagnosis eventually being made.

In the second and third case, if anti-streptococcal titres had have been measured at the initial presentations and found to be elevated, these presentations would have fulfilled the Jones Criteria for acute rheumatic fever; there was one major manifestation (polyarthritis) with two minor manifestations (fever and raised inflammatory markers). In the first case, the episode of hip monoarthritis alone could be argued to be a major manifestation on its own; some experts have advocated for monoarthritis to be considered as a major manifestation in high-risk populations, and Australian guidelines allow this for populations where there are high rates of acute rheumatic fever (incidence >30 per 100 000) or rheumatic heart disease (prevalence >2 per 1000) [2, 3]. Monoarthritis as part of acute rheumatic fever has also been described in industrialized countries where acute rheumatic fever is far less common; one study in the USA reported three cases of monoarthritis that were initially treated as septic arthritis but were subsequently diagnosed as acute rheumatic fever after the development of carditis during the same presentation [4].

None of these children were noted to have a cardiac murmur at their initial presentations. Careful cardiac examination by a physician familiar with acute rheumatic fever is crucial in any patient with arthritis in areas where rheumatic fever is common. Subtle murmurs may have been present in these children, and if detected may have dramatically altered the outcome. However, absence of carditis in the first presentation of acute rheumatic fever does not necessarily mean that there will be absence of carditis in subsequent episodes [3]. We believe that, where available, an echocardiogram should be performed as part of the work-up for any child suspected of having acute rheumatic fever, regardless of whether a

murmur is present or not. Although subclinical or silent carditis (echocardiographic evidence of carditis but without obvious clinical signs) is not included in the Jones criteria, the most recently published World Health Organization guidelines suggest that this form of carditis is part of the spectrum of rheumatic carditis and should be treated with secondary prophylaxis [5]. Recent large surveys of rheumatic heart disease in Cambodia and Mozambique have indicated that there are up to 13 times as many cases of rheumatic heart disease detected by echocardiography compared with clinical auscultation [6].

In areas where acute rheumatic fever and rheumatic heart disease are common we strongly recommend that patients with suspected septic arthritis whom have sterile joint fluid cultures have a work-up for acute rheumatic fever. This includes a thorough clinical assessment by a physician familiar with acute rheumatic fever, an echocardiogram and blood investigations including measurement of antistreptococcal antibodies. A more prompt diagnosis may have a profound impact on outcome.

References

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