Rare coexistence of gouty and septic arthritis: a report of 14 cases

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Abstract

Objective
To analyse the characteristic features of patients with coexistence of gouty arthritis and pyarthrosis at our university hospital in southern Taiwan, an area with high prevalence of hyperuricemia and gout.

Methods
A retrospective chart review was performed for patients who had concomitant gouty and septic arthritis from July 1998 to June 2008. Clinical and laboratory data of these patients were analysed. Furthermore, a comparison was made with published cases in English literature.

Results
Fourteen cases with coexistence of gouty arthritis and pyarthrosis have been identified during the past 10 years. There were 13 male and 1 female, all of Han Chinese in ethnicity, with ages ranging from 45 to 85 and an average of 63.7 years. At disease presentation, there were 11 oligoarticular cases (78.6%), 2 monoarticular cases (14.3%) and 1 polyarticular case (7.1%). Ankle and knee joints were most commonly involved. Bacteriological analyses demonstrated gram-positive cocci in 12 cases, of these 10 were oxacillin-sensitive Staphylococcus aureus (71.4%). Multiple tophi deposition was noted in 13 patients (92.9%) and among them 11 patients (84.6%) had associated chronic kidney disease.

Conclusion
Different clinical presentations and bacteriological characteristics have been identified in the present series. While the mechanisms responsible for such a coexistence remain to be elucidated, these cases underline the importance of thorough evaluation of the aspirated synovial fluid. Our report adds a novel insight into the understanding of the clinical and microbiological manifestations of such a rare concurrence of gouty and septic arthritis.

Key words
Gouty arthritis, septic arthritis, Staphylococcus aureus.
Introduction

Gout is caused by the deposition of monosodium urate (MSU) crystals in and around joints with clinical manifestations including acute gouty arthritis, tophi deposition in joints, chronic arthropathy and renal complications such as renal calculi and renal insufficiency, as well as chronic comorbidities including obesity, diabetes, hypertension and coronary heart disease (1, 2). Although gouty arthritis is an ancient disease and its management is largely based on empirical practice, there are increased evidence-based recommendations for treatment of acute and chronic gouty arthritis (3). Furthermore, the national evidence-based guidelines for the management of such patients have been developed (4). Taiwan, located in the Western Pacific off the southeast coast of China, is a world-famous high prevalence area of hyperuricemia and gout (5). A large series study from northern Taiwan area demonstrated a changing clinical pattern with earlier age of onset, a greater frequency of familial gout and proportionally more female involvement (6). Moreover, there were increased reports of unusual concomitant gout and infection such as septic arthritis and necrotizing fasciitis in that area (7, 8). Polyarticular gout and septic arthritis can both induce fever and swollen, warm, erythematous joints (1, 9). To distinguish them from each other is difficult, and bacterial cultures as well as Gram stain are necessary to rule out septic arthritis. Even in the ready presence of MSU crystals, microorganisms identified later from the aspiration of gouty joints have been documented. Although this phenomenon has not frequently been recognised clinically, a 15-year report in analyzing such cases was demonstrated from a university hospital located in northern Taiwan area (7). There is no available report of concomitant gouty arthritis and pyarthrosis in southern Taiwan. In the present study, we performed a retrospective 10-year chart review from 1998 to 2008 from our university hospital located within southern Taiwan (10). Different clinical observations and bacteriological analyses have been identified in the patients who had coexistent gouty and septic arthritis. Our report adds a novel insight into the understanding of clinical and bacteriological manifestations of the rare coexistence of gouty arthritis and pyarthrosis.

Patients and methods

Patients

A retrospective chart review was performed from July 1998 to June 2008 for patients who had gouty arthritis and/or pyarthrosis and were admitted to the National Cheng Kung University Hospital. The diagnosis of gouty arthritis was made according to the 1977 American Rheumatism Association Criteria (11). The coexistent gouty and septic arthritis was defined in those patients who had concomitant positive bacterial culture and MSU crystal in aspirated synovial fluid from the same joints. Permissions were obtained from our institutional review board for this retrospective study.

Clinical and laboratory assessments

Clinical and laboratory data in these patients were analysed, including age/sex, presence of fever, involved joints with duration of attacks, associated medical conditions, surgical procedures, disease outcome, synovial fluid white cell counts with differentials and bacteriological analyses including microbiogramism identification and Gram stain, and blood culture. Furthermore, a comparison was made with published cases from northern Taiwan and other patients reported in English literature (7, 12-28). The comparative features contained demographic characteristics, clinical presentations, survival outcome and microbiological analyses.

Results

Fourteen patients altogether met the required definition of concomitant positive bacterial culture and MSU crystal in aspirated synovial fluid from the same joints. Their demographic, clinical and laboratory characteristics and bacteriological analyses were shown in Table I. There were 13 male and 1 female, all of Han Chinese in ethnicity, with ages ranging from 45 to 85 and an average of 63.7±10.9 years. Fever was noted in 10 out of 14 patients (71.4%).

Competing interests: none declared.
The numbers of joints involved at disease presentation were oligoarticular in 11 cases (78.6%), monoarticular in 2 cases (14.3%) and polyarticular in only 1 case (7.1%) with the duration ranging from 2 days to 2 weeks and an average of 6.5±4.0 days. The most commonly involved joint area was ankle (78.6%), followed by knee (57.1%) and elbow (21.4%). Except for the patient No.14, the other 13 patients had the gout history for more than 10 years. The most common associated conditions were tophi deposition in 13 cases (92.9%), followed by chronic kidney disease in 11 cases (78.6%) and diabetes mellitus in 3 cases (21.4%). The surgical managements included debridement in 5 cases (35.7%) and amputation in one case (7.1%). The disease outcome was improvement and survival in 10 cases (71.4%). The synovial white cell counts were done in 6 cases with numbers varying from 11,610 to 85,000/mm³ and an average of 44,102 ±30,306, and a classification dominant in neutrophil (87 to 99%). The bacteriological analyses demonstrated gram-positive cocci in 12 cases including oxacillin-sensitive *Staphylococcus aureus* in 10 patients (71.4%), oxacillin-resistant *Staphylococcus aureus* (ORSA) in one patient (7.1%), group G streptococcus in one patient (7.1%), and gram-negative bacilli in 2 cases including *Pseudomonas aeruginosa* in one patient (7.1%) and *Klebsiella pneumoniae* in another patient (7.1%). Positive gram stains of joint fluid samples were found in 10 cases (71.4%) and positive blood cultures were in case no. 1, 3, 4, 5, 8, 11 and 13 (50%).

Table II demonstrated the comparison of our patients with earlier reported cases. There were similar demographic data with male predominance; however, the average age was slightly younger in the series reported from northern Taiwan. The oligoarticular presentation was frequently seen in our patients and those observed in English literature outside Taiwan, and rarely polyarthritics in all series. Although the ankle is the most commonly affected joint in our cases, knee joint involvement is frequently observed in all series. Tophi deposition was noted in most patients reported from northern and southern Taiwan areas. Possibly due to the high frequencies of associated systemic diseases such as chronic kidney disease, the survival outcome was slightly lower in the present series. Gram-positive cocc...
coccii were identified in most infected joints with oxacillin-sensitive *Staphylococcus aureus* as the leading microorganism in southern Taiwan.

**Discussion**

In spite of the rare copresence of gouty arthritis and pyarthrosis in English literature, some characteristic features have been observed (7, 12-28). Fever was a usual clinical feature at initial presentation, and the knee joint was commonly involved in all reported series. Subcutaneous tophi deposition is often observed in patients with gout from southern Taiwan, and the foot is a commonly accumulated part (29, 30). Since the Tropic of Cancer runs across the middle of our island, southern Taiwan has a tropical climate with higher temperature and humidity. These patients were vulnerable to local trauma with ulceration and subsequent susceptibility to *Staphylococcus aureus* infection. Most likely, staphylococcal bacteremia leads to metastatic infection in inflamed joints with intraarticular crystal deposition. Indeed, most (53.8%) of our patients with tophi deposition had positive blood culture. Furthermore, the first case report of gouty arthritis complicating pyarthrosis from the Temple University Hospital in 1971 had clinical manifestations very similar to our patients (12). In that report, an 84-year-old male victim of gout for 15 years with multiple tophaceous deposits had inflamed right knee, followed by left knee arthritis and fever. The joint aspiration revealed MSU crystals, and oxacillin-sensitive *Staphylococcus aureus* was identified from both synovial fluid and blood cultures. In addition, the underlying systemic diseases such as chronic kidney disease and diabetes mellitus could predispose our patients to septic arthritis, and the MSU crystal-induced local environment abundant with inflammation and effusion could provide the milieu for the accumulation of blood-borne microorganisms and growth of bacteria (28).

Septic arthritis is an emergent rheumatological problem due to its rapidly destructive process and high mortality and the diagnosis acumen is required to distinguish if it concurs with gouty arthritis. As bacterial and gouty arthritis resemble each other clinically, some efforts have been tried to use quick laboratory tests as the diagnostic aids for bacteriological examinations (32). Although the diagnosis of acute gouty attack could be immediately reached by the identification of MSU crystals from the joint aspiration, these crystals might not be the sole answer to the arthritis presentation. Therefore, if clinical suspicion of the concomitant bacterial arthritis is high, it is imperative to treat with empirical antibiotics first (33). While the coexistence of pyarthrosis and gouty arthritis is clinically unusual, our patients had a chronic history of gout with multiple tophaceous deposition and a high association with chronic kidney disease, and presented with fever and oligoarthritis involving the ankle and/or knee joints.

In conclusion, fourteen cases of the coexistent gouty and septic arthritis have been reported. While the mechanisms responsible for such a coexistence remain to be elucidated, these patients underline the importance of thorough evaluation of the aspirated synovial fluid from acutely inflamed joints. The diagnosis of isolated gouty arthritis, even in the presence of synovial MSU crystals, should be carefully made after the exclusion of coincident infection in high-risk patients.

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References