

CPPD versus Septic Arthritis – Getting The Diagnosis Right

Introduction

Patients admitted to hospital for investigation of an acute swollen joint are frequently presumed to have septic arthritis requiring admission for intravenous antibiotic therapy and less commonly, arthroscopic washout. In our institution the rheumatology service often consults on such patients who typically have been commenced on antibiotics for presumed septic arthritis. We observed that many cases did not include aspiration of joint fluid for assessment with polarizing light microscopy (PLM) before intravenous antibiotic therapy was commenced. We therefore decided to audit patients with a label of septic arthritis to determine if their work up included PLM and if indeed septic arthritis was the correct diagnosis at all.

Method

We retrospectively identified all patients with a Hospital In-Patient Enquiry (HIPE) label of septic arthritis who were discharged from the Mater Misericordiae University Hospital, Dublin, Ireland between 01/01/2019 to 30/11/2020. The medical records, laboratory results and radiology results of these patients were reviewed in order to determine if patients with culture negative septic arthritis possibly had had an alternative diagnosis that better explained their symptoms. Permission was obtained from our institutions Clinical Audit & Effectiveness Committee.

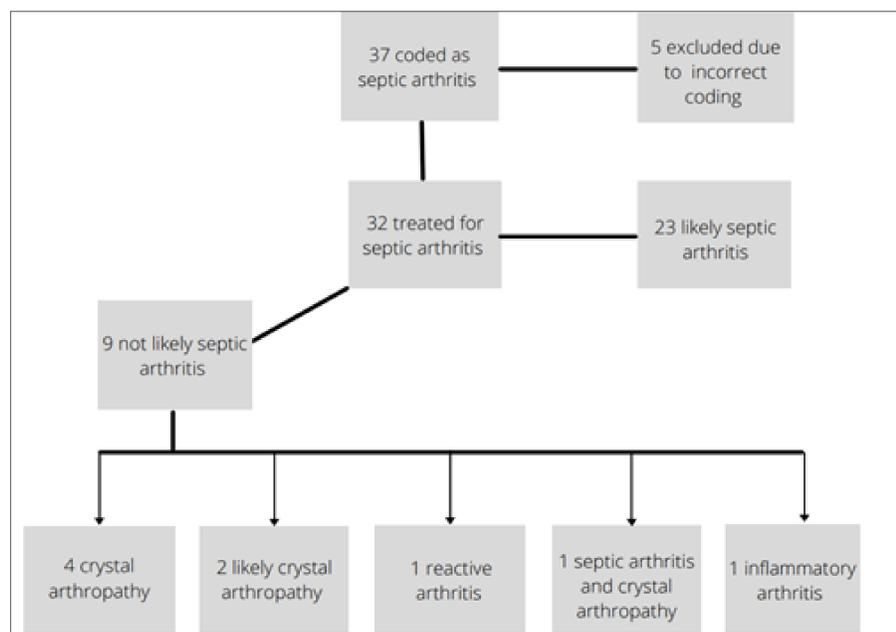
Results

37 patients were identified with a label of septic arthritis and 3 were excluded for incorrect diagnosis coding. Of the 32 patients remaining, only 6 patients had assessment with PLM. We identified 9 patients in total where an alternative diagnosis was more likely. 7 of these were treated for septic arthritis with intravenous antibiotics without a positive joint or blood culture and without evidence of septic arthritis on imaging. 4 of these patients had features consistent with a diagnosis of calcium pyrophosphate (CPP) arthritis, with a further 2 highly suspicious for a diagnosis of crystal arthritis. These 9 patients accounted for a total of 139 inpatient bed days, an average of 15 days admission each. The average length of hospital admission for all patients in this study was 25.9 days. The most common joint affected was the knee (12), followed by the shoulder (5), hip (3), elbow (3), ankle (2), wrist (2), sacroiliac joint (2), lumbar facet joint (1), finger (1) and toe (1). Two of these patients were noted as having two involved joints (knee and hip; knee and elbow) with aspiration only taken from the knee in both cases.

Results

Age	Range: 20 to 101 years	Median: 57
Gender	Male: 17 patients (53.1%)	Female: 15 patients (46.9%)
Length of Stay	Range: 2 to 115 days	Average: 25.9 days
Joint aspiration performed	Yes: 24 (75%)	No: 8 (25%)
Joint culture	Positive: 15 (62.5%)	Negative: 9 (37.5%)
Cell count performed	Yes: 14 (43.7%)	No: 18 (56.3%)
Cell count	Range: 200 – 76,800/ul	Average: 20,765/ul
Crystal analysis performed	Yes: 6 (18.7%)	No: 26 (81.3%)
White cell count	Range: 4.8-25.8 x 10 ⁹ /l	Average: 10.46 x 10 ⁹ /l
C-reactive protein	Range: 12-421 mg/dl	Average: 167.5 mg/dl
Blood cultures performed	Yes: 28 patients (87.5%)	No: 4 (12.5%)
Blood culture positivity	Positive: 10 (35.7%)	Negative: 18 (64.3%)

Final Diagnosis



Conclusions

Septic arthritis is a dangerous condition with significant morbidity and mortality. The differential diagnosis can be broad with many inflammatory and crystal arthritis conditions mimicking it. The co-existence of septic arthritis and crystal arthritis should be considered. However this is a rare occurrence much less likely in the absence of a positive joint culture or blood culture.

Crystal arthritis is readily diagnosed on analysis of joint fluid and does not require incubation time unlike joint culture. Screening of patients with suspected septic arthritis for crystal induced arthritis may reduce inpatient stay and the need for intravenous antibiotics.

In our study, 9 patients (28.1%) were identified where an alternative diagnosis was more likely. 7 of these (21.8%) were treated for septic arthritis with antibiotics without a positive joint or blood culture and with no evidence for septic arthritis on imaging. 4 of these patients (12.5%) met the criteria for a definite diagnosis of CPP arthritis, with a further 2 (6.25%) were highly suspicious for a diagnosis of crystal arthritis.

More input from rheumatology services would be of benefit to this patient cohort as would better access to PLM either as a bedside test performed by a rheumatologist or in a hospital laboratory with appropriately trained technicians. The development of new classification criteria for CPP deposition (CPPD) disease is currently underway. It is anticipated that these will improve awareness and detection of this condition, potentially reducing inpatient length of stay and the administration of unnecessary antibiotic therapy.