Reviewer's report

Title: Infectious sacroiliitis: a retrospective, multicentre study of 39 adults.

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Reviewer: Chi-Lai Ho

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Non-brucellar and non-tuberculous infectious sacroiliitis (ISI) is a rare disease with diagnosing difficulty. The study aims to identify different clinical, bacteriological and imaging findings that are related to ISI in order to identify a parameter or method to achieve early diagnosis. This study found that clinical manifestations of ISI usually led to delayed diagnosis of ISI. MRI was suggested to be useful to diagnose arthritis in 25 patients and it was thus recommended in clinical situations characterized by lumbogluteal pain and symptoms of infectious disease, such as fever.

General weakness:

The authors made a comprehensive review of the clinical, bacteriological and imaging parameters on their 39 patients with diagnosis of ISI. Among these 39 patients, they found that 25 patients had abnormal MR signal changes at the sacroiliac joint and concluded with recommendation that MRI of the spine and sacroiliac joints should be performed in patients with suspected ISI. An important weakness of this study is the assumption that their patients do not have preexisting underlying pathology such as degenerative, traumatic or autoimmune SI joint disease that might just coexist with rather than the cause of their clinical features. The duration between onset of symptoms to MR imaging is not mentioned. The number of patients with abnormal MRI finding confirmed by the “gold standard” - articular puncture with culture of aspirated joint fluid - is not mentioned. For those without positive aspiration proof but diagnosed of ISI by ancillary evidence with abnormal MR findings, there is no follow-up imaging proof of improvement after treatment to exclude preexisting arthritic conditions. Even for those patients with MR follow-up studies, the authors cannot prove that ISI is the sure cause of the MR abnormalities because, as also stated by the authors, persistence of pathological signals on MRI could be up to 19 months after diagnosis. This raises an important limitation of MRI that is not discussed by the authors. The authors might want to touch on the difficulty of MRI in treatment monitoring and exclusion of pre-existing conditions, which might be more confidently evaluated by other functional imaging modalities such as PET/CT (briefly mentioned by this paper).

More specific questions:

“Magnetic resonance imaging (MRI) (n=27), when focused on the SI (n=25), allowed for a definitive ISI diagnosis in 100% of cases – P2
“MRI always confirmed the diagnosis of ISI, provided that the slices were made through the SI.” – P9

# Diagnostic criteria and imaging sequence of MRI in diagnosing ISI is not stated
# The 25/39 cases had MRI (focused on SI) diagnosis of ISI.
# Does the MRI signal abnormality have any specific feature for ISI when compared with other types of sacroiliitis, e.g. autoimmune or preexisting degenerative causes?
# MRI in this study is NOT for a definitive ISI diagnosis in 100% of cases (actually 25/39 = 64% in this study; the rest of 36% is not certain)

“The persistence of pathological signs was noted on MRI performed between 5 weeks and 19 months after diagnosis (n=4)” – P7

“MRI signal anomalies persist for several months” and “There are no typical features differentiating spondyloarthopathies from ISI” – P9

# Does it mean that the MRI abnormality has no specific feature to differentiate acute from post-treatment ISI, previous or other causes of sacroiliitis?

ISI was diagnosed if sacroiliitis was confirmed bacteriologically or, in the absence of pathogenic agents, if clinical, biological, and radiological data was compatible with this diagnosis and evolution was favourable under antibiotic therapy – P2

# In the absence of pathogenic agents, does antibiotic therapy with improvement exclude brucellar sacroiliitis?

“MRI of the lumbar spine and SI in a febrile patient with gluteal pain should allow for a more rapid diagnosis of ISI” – P12

# Specificity of MRI in diagnosing ISI not addressed

Data and statistical mistakes should not be found in a carefully written paper:

“an abdominopelvic scan (n=27) was abnormal in 21 cases, suggesting arthritis of the SI joints in 13 cases (48.1%) and a psoas abscess in seven” – P2

# 13+7=20. What is the finding of the 21st case?

“The study included all patients with ISI hospitalized between 1995 and 2011” – P4

# 16 years! The MRI scanners and technical specifications have changed at least 3 generations. How did the MR results compare between the 1st and last case?
# Are all patients with previous sacroiliitis or underlying sacroiliac joint pathology excluded from the study?

“Fever was defined as a temperature above 38.2oC” – P4

# Why choose 38.2oC? Some defined fever using infrared tympanic thermometry above 37.8oC

# “17 out of 39 patients (41%) were febrile (mean temperature 37.7 +/- 1oC)” – P5, not match the definition of above 38.2oC
“17 out of 39 patients (41%) were febrile (mean temperature 37.7 +/- 1°C)” – P5
# Should be 44%

“Time to diagnosis was evaluated with certainty in 36 cases, but remained long
(mean 43.3 +/- 69.1 days) – P5
# How was the diagnosis established in the patient diagnosed at > 100 days

“(CT) scans were carried out, revealing arthritis of the SI in <50% of cases” – P6
# What kind of arthritis?

Format comments
Standardization of number of decimal place used in the paper
Use same normalized: abdominopelvic scan – CT scan
Typo : P3 “lombogluteal” – lumbogluteal

Strength
Clinical discussion and literature review of ISI in general.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No, the manuscript does not need to be seen by a statistician.