A rare combination of rare conditions: *Salmonella* septic sacroiliitis and hepatitis

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SUMMARY

We report an unusual presentation of sacroiliitis and hepatitis secondary to *Salmonella* systemic infection. A high index of suspicion, early blood cultures, prompt investigations and treatment with parenteral antibiotics can result in complete resolution of symptoms and prevent long-term sequelae of either condition.

BACKGROUND

Salmonella

The *Salmonella* genus consists of a large heterogeneous group of motile, Gram-negative, non-spore-forming, rod-shaped bacilli that affects both humans and animals. Humans are infected with *Salmonella* almost solely via ingestion of contaminated food or water.¹

Salmonella infections can manifest in a multitude of ways. Gastroenteritis is the predominant presentation, and sequelae can include enteric fever; bacteraemia with or without endovascular infections such as aortitis and endocarditis; and focal metastatic infections such as sacroiliitis, osteomyelitis and abscess formation.²

Sacroiliitis

Bacterial septic sacroiliitis is an uncommon spinal infection that occurs most commonly in children and young adults and is thought to arise from haematogenous spread of bacteria. It has been suggested that 10% of children with pyogenic sacroiliitis have a history of pelvic trauma. Although, in adults, the most common predisposing factor is intravenous drug use.³

The most common pathogens implicated are *Staphylococcus aureus* and *Streptococci* with *Pseudomonas aeruginosa* more common in intravenous drug users.⁴

Other rarer causes include *Escherichia coli*, *Salmonella* sp, *Tuberculosis* and *Brucella*.^{5 6}

CASE PRESENTATION

A 15-year-old, previously fit and well, boy presented to our emergency department in May 2012. He complained of a 2-day history of right buttock and lower back pain associated with inability to bear weight. He recalled a non-specific history of falling while playing football 2 weeks back. He also complained of abdominal pain and vomiting for the previous 24 hs. He had been to Bali 4 weeks back but denied any associated diarrhoea, nausea or vomiting.

On the day of admission, examination revealed fever (38.2°C) with a blood pressure and pulse within normal limits. Physical examination was

unremarkable except for his abdominal and musculoskeletal examination.

He had tenderness in his right gluteal and sacral region with a palpable fullness over the sacrum on the right side. Active and passive flexion and external/internal rotation of the hip was limited due to pain.

He had generalised abdominal tenderness maximal in the right upper quadrant with associated guarding. Bowel sounds were normal.

Of note, there were no other joints involved and no skin rashes or eye involvement.

INVESTIGATIONS

Significant laboratory findings included a normal white blood cell count of $5.2 \times 10^9/l$ (neutrophils $4.9 \times 10^9/l$, lymphocytes $0.2 \times 10^9/l$), elevated erythrocyte sedimentation rate of 32 mm/h and elevated C reactive protein measuring 255 mg/dl.

On admission, abnormal liver function tests were noted with a bilirubin of 41 mg/dl, alanine aminotransferase (ALT) 34 U/l and alkaline phosphatase (ALP) 146 U/l. Five days postadmission bilirubin was 45 mg/dl, ALT 133 U/l, ALP 169 U/l and GGT 143 U/l.

Urea and electrolytes, APTT, PT, creatine kinase, corrected calcium, serum immunoglobulin and complement levels were within normal limits. Tests for malaria parasite, hepatitis A (HAV IgM), B (HBsAg) and C (anti-HCV) were negative.

Urine dipstick was negative. Mid-stream urine sent before antibiotic therapy was initiated was sterile. Blood cultures grew *Salmonella enteritidis* (phage type PT 6a).

HLA-B27 and antinuclear antibody were negative.

The sacroiliac joints, pelvis, lumbosacral spine and hip joints were normal on initial radiographs.

CT abdomen was performed on day 3 (figure 1). This revealed marked hepatomegaly. This was associated with periportal and pericholecystic fluid with a small amount of ascites—consistent with an acute hepatic process. The gallbladder was distended but acalculus and thin walled. The appendix was visualised and had a normal appearance.

Pelvis MRI demonstrated a $4 \times 0.7 \times 3$ cm complex fluid collection lying deep to the right gluteus maximus muscle and overlying the sacroiliac joint (figures 2 and 3).

A further pelvis MRI performed on day 10 demonstrated right-sided sacroiliitis with marrow oedema on either side of the sacroiliac joint and inflammation within the joint (figure 4).

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Figure 1 MRI pelvis day 1.

TREATMENT

A period of 24 h after presentation, positive blood cultures for a Gram-negative bacillus prompted empirical treatment with intravenous metronidazole, gentamicin and ceftriaxone. Definitive treatment with intravenous ceftriaxone was started 48 h after presentation.

OUTCOME AND FOLLOW-UP

The patient made good recovery clinically and his blood test, including liver function tests, normalised over a period of 10 days intravenous antibiotics in hospital. He was discharged home on ambulatory intravenous ceftriaxone once daily for a further 2 weeks. After assessment in clinic 2 weeks following discharge, he completed a 2-week course of oral cefixime.

He has since made a full recovery with no lasting discomfort in his sacroiliac joint.

DISCUSSION

An extensive PubMed search and review of all the references identified 29 previously reported cases of *Salmonella* sacroiliitis.^{1–46} None of these cases were identified as having had deranged liver function tests.

Figure 3 MRI pelvis day 5.

This case illustrates the unusual presentation of *Salmonella* sacroiliitis.

Reactive arthritis following *Salmonella* gastroenteritis is a well-recognised clinical entity. HLA-B27 positive patients have an increase in the severity of acute disease and a poorer long-term prognosis.⁷ Pyogenic infection of the sacroiliac joint, as seen in this case, is rare.⁸

Previous case reports have frequently highlighted delays from presentation to diagnosis.² Consequently, a high index of suspicion is required in young patients presenting with fever and unexplained unilateral lower back pain.³

In this case, diagnosis was an increased challenge due to concurrent abdominal pain. In a review of 191 sacroiliitis cases by Cohn *et al*,⁹ 13% presented with abdominal pain, with 42% of them proceeding to laparotomy. However, in the patient presented above, it is likely that his abdominal pain was at least, in part, due to an acute hepatic process. Hepatitis is a commonly reported complication of *Salmonella typhi*,^{10 11} and deranged liver enzymes have also been reported in up to 35% of patients with *Salmonella enteritidis* enterocolitis.¹² Liver enzyme derangement is predominantly moderate and self-limiting.¹²

Figure 2 CT abdomen day 3.

Figure 4 MRI pelvis day 10.

In addition, the distended gallbladder could represent an empyema. However, this was not treated surgically and resolved with antibiotic therapy alone.

Despite a 48 h delay in confirming a definitive diagnosis, the patient was started on appropriate antibiotics on day 1 of admission. Previous reports have advised a wide range of antibiotic regimens; Zimmerman *et al*¹³ recommend a minimum of 4 weeks intravenous antibiotic therapy followed, in some cases, by a course of oral antibiotics. In contrast, Ulug *et al*¹ report using intravenous antibiotics for 1 week followed by 5 weeks oral therapy successfully.

In this case, we gave parenteral antibiotics for a total of 24 days followed by oral therapy for a further 4 weeks with full resolution of detectable disease process.

It has been reported that MRI provides optimum diagnostic accuracy in septic sacroiliitis.¹³ It has the unique ability to detect fluid in the sacroiliac joint, bone marrow oedema and soft tissue abscesses while concurrently not exposing the patient to large amounts of ionising radiation.¹³ ¹⁴ However, changes may be subtle especially at initial presentation and should be interpreted in the light of clinical symptoms.

Learning points

- ▶ Sacroiliitis should be considered as a diagnosis in all patients presenting with buttock or hip pain and difficulty in bearing weight.
- ▶ A high clinical suspicion and prompt antibiotic therapy is required to prevent long-term sequelae.
- ▶ Sacroiliitis is best imaged using MRI.
- ▶ *Salmonella* sacroiliitis is a rare condition and has not previously been reported with concurrent deranged liver enzymes.

Competing interests None.

Patient consent Obtained.

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