Salmonella paratyphi A-infected ovarian cyst in returning traveller—an unusual complication of enteric fever

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Abstract

We report a case of Salmonella paratyphi A enteric fever in a returned New Zealand traveller complicated by an infected ovarian cyst, which resulted in clinical and microbiological relapse despite appropriate antibiotic treatment. Extraintestinal manifestations of enteric fever are infrequent but should be considered in situations where treatment response to first-line antibiotics for adequate duration is suboptimal.

Salmonella enterica serotype typhi (S. typhi) and S. enterica serotype paratyphi (S. paratyphi) A, B, and C. These Salmonella enterica serotypes are well adapted in human intestines, and are important causes of systemic febrile illness in crowded and deprived populations with inadequate sanitation exposed to unsafe water and food.

Travellers to endemic areas like South Central and South East Asia are therefore at risk of infections. In 2000, typhoid fever caused an estimated 21.7 million illnesses and 217,000 deaths, and paratyphoid fever caused an estimated 5.4 million illnesses worldwide.

Although S. typhi is considered the dominate pathogen causing enteric fever and complications, infections from S. paratyphi types A, B and C are becoming an increasingly common and important since typhoid vaccine is not protective against S. paratyphi. In New Zealand, a vast majority of enteric fever cases are acquired overseas.

In 2013–14 (between April and March) there were 1074 notifications on salmonellosis (non-typhi) with an estimated rate of 24/100,000 population compared to S. typhi infections in 1/100,000 population. Recently there has been a marked increase in S. paratyphi A diagnosed from blood cultures of Cambodian citizens reported between January and August 2013.

Complications are associated with 10–15% of enteric fever with gastrointestinal bleeding or intestinal perforations being the most common, but this is usually much lower in travellers who have access to appropriate treatment more readily. There are sporadic reports of genitourinary infection in literature, and none reported in Australia or New Zealand since 1989.

Case report

A 29-year-old female secondary school teacher, with no prior medical history, was referred to hospital in May 2013 a with a 3-week history of intermittent fever, abdominal discomfort and occasional non bloody diarrhoea that started while en route to New Zealand from a 2-week history school trip to Vietnam and Cambodia.
She was initially managed in the community by her GP with treatment for presumed giardia, after malaria was ruled out on basis of blood films and antigen testing. Symptoms persisted after which blood cultures were performed. Positive growth was recorded after 24 hours of incubation with Gram-negative bacilli seen on Gram stain, resulting in referral to hospital.

She was previously fit and well, without any comorbidities, and no long-term medications. She received appropriate pre-travel advice, malaria chemoprophylaxis, and vaccination including typhoid polysaccharide vaccine (Typherex®).

Blood cultures were confirmed as Salmonella paratyphi A by conventional testing and confirmation by Vitek2® automated identification system. Isolate was fully susceptible to amoxicillin, ceftriaxone and nalidixic acid. On initial examination, she was cardiovascularly stable, febrile at 38°C, without localising signs. She responded well to initial treatment with defervesence, improvement in symptoms, and negative follow-up blood cultures.

She was treated after 3 days of IV ceftriaxone 2 grams once daily and discharged with 10 days oral ciprofloxacin 500 mg bd. C-reactive protein (CRP) decreased from 130 mg/L on admission to 80 mg/L on discharge. However 8 days into ciprofloxacin treatment she developed fever and rigors and intermittent lower abdominal pains, which persisted requiring readmission at day 12. Examination revealed a low grade temperature (37.6°C) and mild right iliac fossa tenderness. Repeat blood and stool cultures were negative.

IV ceftriaxone was again initiated, but intermittent fevers to 38.9°C, ongoing malaise, and a rising CRP resulted in CT abdomen and pelvis being performed which demonstrated a pelvic collection shown and reported in Figure 1.

**Figure 1**

![Image of CT scan](image-url)

**Note:** There is a large well-defined mass within the Pouch of Douglas, with approximate measurements of 11.0x10.5x8.5 cm, exerting mass effect on the adjacent uterus and rectum. The differential is wide and includes ovarian serous cystadenoma, endometrioma or haemorrhagic ovarian cyst.
Under ultrasound guidance, a 10 French pigtail catheter was inserted and 415ml brown turbid fluid was aspirated. Routine culture grew *Salmonella paratyphi A*. Following drainage the fever resolved, and the CRP normalised during a further 4 weeks of once-daily IV ceftriaxone administered via a PICC line as an outpatient.

**Discussion**

Both *Salmonella typhi* and *S. paratyphi* are known for spread beyond the alimentary track and can infect almost every organ, causing localised suppurative complications.\(^7\) These bacteria avoid significant host immune response when translocating the gut mucosa. After phagocytosis they replicate within cells of the gut-associated lymphoid tissue and of other cells of monocytic lineage that are disseminated throughout the reticuloendothelial system.\(^8\)

Prolonged bacteraemia which is likely in this case, is presumed to have resulted in haematolagous spread to an undiagnosed ovarian cyst or endometrioma. The cystic medium provided a harbour from lethal concentrations of antibiotics over 13 days of treatment, with survival and relapse of a febrile illness and culture of the organism from the tubo-ovarian collection.

There have been at least 17 case reports of *Salmonella* spp. causing ovarian or tubo-ovarian abscesses in the literature since 1975,\(^9\) mostly due to *S. typhi* and nontyphoid salmonella. This would be the third involving *S. paratyphoid A*, and given the lack of effective vaccine may become a more prominent pathogen causing localised suppurative complications in returned travellers.\(^10\)

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**References:**
