

CASE REPORT

# Acute infectious pancreatitis due to *Salmonella typhi*: Case report and literature review

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## Introduction

*Salmonella typhi* infection or typhoid fever remains an endemic disease in Madagascar.<sup>1</sup> As in low- and middle-income countries with poor water and sanitation systems, typhoid fever remains a persistent health problem in Madagascar, with an incidence of 171 per 100 000 individuals aged 5–14 years in rural setting.<sup>1,2</sup> *S. typhi* is responsible for various complications (cholecystitis, appendicitis, peritonitis, prostatitis, osteomyelitis, etc.).<sup>3</sup> Acute pancreatitis (AP) remains a rare complication of *S. typhi* colitis.<sup>3</sup> Despite its high prevalence in Madagascar, no case of acute *Salmonella* pancreatitis has been described. We report a case of benign AP complicating infection with *S. typhi*.

## Abstract

*Salmonella typhi* remains an endemic disease in Madagascar. Acute pancreatitis remains a rare complication of *S. typhi* colitis. We presented the case of a 27-year-old male, admitted to febrile diarrhea, vomiting, and severe abdominal pain. Blood work-up revealed elevated plasma lipase level. Abdominal CT scan showed acute pancreatitis without necrosis. Blood and stool culture positivity for *S. typhi*. Patient was diagnosed as acute pancreatitis caused by *S. typhi*. The outcome was favorable under symptomatic medical treatment (rehydration and analgesic) combined with adapted antibiotic therapy. Acute pancreatitis is a possible complication of *Salmonella* infections. The presence of severe abdominal pain and febrile diarrhea should draw clinicians' attention to possible *Salmonella* acute pancreatitis.

## Case report

A 27-year-old male was hospitalized for acute diarrhea with 6–7 stools per day associated with vomiting, severe periumbilical abdominal pain (visual analog scale of 9/10), and a fever of 38.5°C. He did not have a history of alcohol abuse. Clinical examination revealed a periumbilical guarding with an overall tenderness abdomen. The laboratory workup reported a hyperleukocytosis at 11.3 g/L (reference range: 4–10 g/L), an increase in C reactive protein (CRP) at 157 mg/L (reference range <10 mg/L), and lipasemia at 1045 IU/L (reference range: 60 IU/L). The liver function tests were normal. Serum calcium and triglyceride level were normal. Abdominal ultrasound did not show gallstone or intrahepatic lithiasis. Abdominal CT scan revealed a swollen but homogeneous

**Table 1** Few reported cases of acute pancreatitis due to *Salmonella typhi*

Years [ref]	Age (years)	Sex	Clinic signs	Bacteria Isolation site	Treatment	Outcome
1991 <sup>5</sup>	16	F	Periumbilical pain	Blood	Chloramphenicol	Favorable
1993 <sup>6</sup>	7	F	Abdominal pain, vomiting, fever, diarrhea	Stool	Ampicillin + sulbactam	Favorable
	10	F	Diarrhea	Stool	Cotrimoxazole + metronidazole	Favorable
1998 <sup>7</sup>	16	M	Abdominal pain, fever, headache, epistaxis	Blood	Ampicillin	Favorable
2009 <sup>8</sup>	11	M	Abdominal pain, stool anomalies, fever	Blood	Cefixime	Favorable
2015 <sup>9</sup>	30	M	Fever, headache, severe abdominal pain	Blood	Meropenem	Favorable

F, female; M, male; ref, references.

pancreas in favor of acute edematous B-stage Balthazar pancreatitis. Blood and stool culture were positive for *S. typhi*. The antibiogram showed a multi-sensitive *S. typhi*. The outcome was favorable under symptomatic medical treatment (rehydration and analgesics) combined with third-generation cephalosporin type antibiotic therapy (Ceftriaxone) with rapid clinical improvement and apyrexia at 48 h. We ultimately retained the diagnosis of benign infectious origin acute pancreatitis due to *S. typhi*.

## Discussion

The causes of acute pancreatitis are dominated by lithiasis and alcohol causes (>80%).<sup>4</sup> Infectious origin acute pancreatitis remains a rare entity. A variety of infectious microorganisms can cause infectious pancreatitis, including viruses, bacteria, and parasites.<sup>3</sup> *Salmonella* infection has been reported by several authors as a possible cause of acute bacterial pancreatitis.<sup>3,5–9</sup> The description of the few reported cases of acute pancreatitis due to *S. typhi* is reported in Table 1. However, further investigation needs to be done to rule out other causes of AP and correlate the infectious agent with a disease in order to avoid misdiagnosis and, subsequently, poor management of the disease.<sup>3</sup> In our patient, the diagnosis of AP was suspected due to the presence of intense epigastric pain and confirmed by a marked increase in lipasemia and a radiologic image in favor of acute edematous pancreatitis. The classic causes of AP (gallstones, alcohol, hypercalcemia, hypertriglyceridemia) have been ruled out. The presence of febrile diarrhea drew the authors' attention to a possible infectious origin. The presence of *S. typhi* on the bacteriological samples (blood and stool culture) and the favorable outcome with symptomatic medical treatment (rehydration and analgesic) associated with an appropriate antibiotic therapy allowed us to finally retain the diagnosis of an infectious AP with *S. typhi*.

Treatment for infectious AP is no different from treatment for AP due to other causes.<sup>5</sup> Since *Salmonella* AP is moderate in the majority of reported cases, symptomatic medical treatment is usually sufficient. The third-generation cephalosporins are currently the antibiotic therapy of choice. The initial antibiotic therapy must be adapted secondarily according to the antibiogram.<sup>10,11</sup>

The prognosis for *Salmonella* AP was good in all reported cases, including in our patient.<sup>3,5–9</sup> This could be explained by the young age of the patients and the mild nature of pancreatitis in the majority of *Salmonella* infections.

In conclusion, acute pancreatitis is a possible complication of *Salmonella* infections. The presence of pancreatic-type pain

and febrile diarrhea should draw clinicians' attention to possible *Salmonella* AP. This statement is more relevant in an area with endemic *Salmonella* infections. The prognosis was good with a favorable outcome under symptomatic medical treatment combined with appropriate antibiotic therapy.

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