

The first description of liver abscesses due to *Salmonella enterica* subsp. *enterica* in an African HIV-infected young woman: case report and review of the literature

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ABSTRACT

Salmonella is Gram-negative bacilli that cause a foodborne infections. When the disease occurs in patients living with HIV (PLWHA), salmonellosis is an AIDS defining illness. Here we describe the case of a 26-year-old HIV-infected female patient who was hospitalized for pain in the right upper quadrant of the abdomen, and whose explorations revealed a liver abscess due to *salmonella enterica enterica* that progressed well after needle aspiration and antibiotic treatment.

KEYWORDS: *Salmonella*. AIDS. Liver abscess. HIV. Bacteriology.

INTRODUCTION

Salmonella spp are Gram-negative bacilli, characterized by O, H, Vi antigens, and flagellum. It is a foodborne infection¹ with signs and symptoms varying from gastroenteritis to enteric fevers, and focal abscesses are rare¹. When it occurs in patients living with HIV (PLWHA), salmonellosis is an AIDS defining illness². We present the case of bacteriologically-confirmed liver abscess due to *Salmonella* in a young PLWHA woman.

CASE REPORT

Here we describe the case of a 26-year-old female patient with an HIV-1 infection (PLWHA) initially revealed by a pulmonary tuberculosis correctly treated and cured, who was on a combined antiviral triple therapy based on *efavirenz/emtricitabine/tenofovir disoproxil* (TDF/FTC/EFV) for three years, but which she stopped one year before the present hospitalization. She sought the emergency department for a one month complaint of melena with chronic liquid diarrhea at a rate of three stools a day, accompanied by fever and weight loss, but without rectal syndrome. On admission, the patient was conscious, presented with a Glasgow coma score of 15/15, was hemodynamically and respiratory stable, febrile with a body temperature of 38 °C, heart rate of 100 per min, respiratory rate of 20 cycles per min, blood pressure of 110/40 mmHg, weighting 46 kg, in addition to an oral candidiasis with possible esophageal involvement. On the abdominal examination, the patient had pain on the right upper quadrant, epigastric tenderness associated with a homogeneous hepatomegaly (21 cm) and splenomegaly (14 cm) and the hernia orifices were free. The abdominal ultrasound showed multiple collections at the level of the segments I, IV, and V related to liver abscesses of which the

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largest lesion measured 5.8 by 4.2 cm with hepatomegaly associated with an anechoic peritoneal effusion of moderate abundance (Figure 1). The patient was treated empirically with ceftriaxone, metronidazole and gentamicin for the liver abscesses, fluconazole for oral and esophageal candidiasis, and a medication to slow down the intestinal transit.



Figure 1 - Ultrasound of the liver showing an abscess due to *Salmonella* sp. at the level of the segment IV associated with hepatomegaly: 1 = 5.8 cm; 2 = 4.2 cm; FH = size of hepatomegaly.

On the blood count, the patient had normochromic normocytic anemia, 5.8 g/dL of hemoglobin (11.5 – 16.5), lymphopenia, with 840/mm³ (1,000 – 4,000), normal leukocytes - 6,040/mm³, (3,600 – 11,000), normal neutrophils - 4,490/mm³ (1,800 – 7,500), and a normal platelet count of 166,000/mm³, (140,000 – 400,000), and the CD4 – positive T cell count was 27 cells/mm³. She had hepatitis flares and cholestasis with AST 162 IU/L (5N) (< 30), ALT 55 IU/L (N) (< 50), ALP 495 IU/L (5 N) (30–100), γ GT 280 IU/L (6 N) (<45), CRP 117 mg/L (< 5 mg/L), normal renal function; negative serology to hydatid, amebiasis, hepatitis B virus (HBV), hepatitis C virus (HCV), syphilis and toxoplasmosis, while serology to CMV IgG was positive but negative to IgM, COVID-19 RT-PCR and IgG antibodies raised to SARS-CoV-2 were negative, and the patient also presented with negative sputum evaluated by the Xpert MTB/RIF (Genexpert® Cepheid Inc, California, USA) and three Acid-Fast Bacilli (AFB) smear microscopy, three cultures of stool and parasitological stool examination were also negative, in addition to a blood culture.

An ultrasound-guided puncture was performed which

revealed the presence of a *Salmonella enterica* subsp. *enterica* in the purulent secretion that was only resistant to cefalotin, ceftiofloxacin, gentamicin, amikacin, but was sensitive to amoxicillin (Figure 2). The Genexpert® on the purulent secretion was negative. A wet smear was negative for *Entamoeba histolytica* trophozoite. Next, we stopped metronidazole and gentamicin and we continued the treatment with intravenous amoxicillin plus clavulanic acid 1 g tid for eight days; then we switched to oral amoxicillin 1 g tid during three weeks and the antiretroviral therapy was restarted. Ten days after the treatment, the patient improved clinically and the CRP decreased to 13 mg/L. A follow-up ultrasound showed that the size of the abscess had decreased and the patient had a favorable outcome.

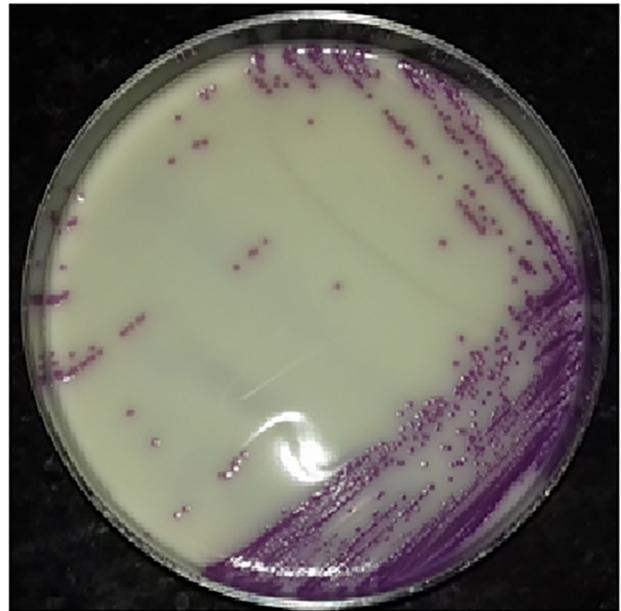


Figure 2 - Morphology of *Salmonella enterica* subsp. *enterica* colonies on the Chromogene OXOID™ Brilliance™ medium.

DISCUSSION

Salmonellosis is a major public health problem in resource-constraint countries¹. Severe forms of *Salmonella* infection usually occur in immunocompromised hosts¹. To our knowledge this case is the first description of an African PLWHA with bacteriologically-confirmed liver abscess caused by *Salmonella* and the third case in the world^{2,3}.

The pathogens responsible for liver pyogenic abscesses are *Streptococci*, *Staphylococci*, *Escherichia coli*, *Klebsiella pneumoniae*, bacteroides and *Enterococci*⁴. Isolation of *Salmonella* from a liver abscess is rare, and its occurrence in HIV-infected individuals is very exceptional. A review of the literature on the PubMed database using the terms:

Table 1 - Review of the literature on *Salmonella* spp. liver abscess cases in HIV-infected patients and recent published cases in non-HIV patients.

Publication year	Type of HIV	CD4 count (cells/mm ³)	Age (years)	Sex	Unique or multiple	Isolated from				Treatment			Outcome	Reference
						Abscess	Blood	Stool	Other	Antibiotics	Drainage	Surgery		
2017	–	–	27	–	Unique	×	×			×	×	×	Good	Ladic <i>et al.</i> ⁹
2017	–	–	53	F	Unique	×				×	×	×	Good	Tee Yu <i>et al.</i> ¹²
2015	–	–	65	M	Multiple	×	×			×	×		Good	Kamatani <i>et al.</i> ¹⁷
2015	–	–	64	M	Multiple				×	×			Dead	Hung <i>et al.</i> ¹³
2014	–	–	30	M	Unique	×			×	×			Dead	Mahajan <i>et al.</i> ¹¹
2014	–	–	54	M	Unique	×				×	×		Dead	Imoto <i>et al.</i> ⁸
2014	–	–	24	M	Multiple	×	×			×	×		Lost to follow-up	Jorge <i>et al.</i> ¹⁴
2013	–	–	58	M	Unique	×	×			×	×	×	Good	Qu <i>et al.</i> ¹⁰
2013	–	–	43	M	Unique			×		×			Good	Tulachan <i>et al.</i> ¹⁵
2011	–	–	56	M	Unique	×				×	×		Good	Sheikh <i>et al.</i> ⁶
2006	–	–	8	M	Multiple		×			×	×		Good	Kabra and Wadhwa ¹⁶
2019	HIV-1	88	51	M	Unique	×				×	×		Good	Lin <i>et al.</i> ³
2003	HIV-1	265	31	M	Unique	×		×		×	×		Good	Vidal <i>et al.</i> ²
2021	HIV-1	27	26	F	Multiple	×				×	×		Good	This study

salmonella, salmonellosis, liver abscess, hepatic abscess, in the period from 1952 to 2021 found only 26 cases of which only two occurred in PLWHA^{2,4-17} (Table 1).

The weight loss was constant in our patient and in the two other published cases of liver abscesses due to *Salmonella* in PLWHAs^{2,3}. The mechanism behind this is the chronic diarrhea leading to severe malnutrition and dehydration. Ultrasound images of the liver *Salmonella* abscess like the amebic abscess shows a solitary hypoechoic image located in the middle of the liver or in the right liver, unlike other pyogenic abscesses that most often manifest by multiple hypoechoic images. Imaging results obtained by ultrasound or CT scan can guide the liver puncture so as to isolate the causative pathogen².

For uncomplicated *Salmonella* gastroenteritis, the antibiotic treatment is not recommended because it does not reduce the duration of the disease, on the contrary, it significantly prolongs the duration of the fecal excretion of the bacteria and increases the risk of resistance to antibiotics¹. Salmonellosis should only be treated with antibiotics when there is bacteremia, enteric fever, focal infection or abscesses.

The treatment of abscesses can be limited to the antibiotic therapy if the size of the abscess is less than 4 cm^{2,15}. The combination of needle aspiration and antimicrobial therapy for treating multiple pyogenic liver abscesses is associated with a similar efficacy but a shorter hospitalization time compared to drainage of the abscess

only. The percutaneous drainage is indicated for patients who continue to be febrile even after 72 h of adequate medical treatment and aspiration; liver abscesses > 6 cm; and clinical or ultrasound features suggesting impending perforation, but drainage should always be undertaken before surgery to promote the comfort of the patient and reduce costs. The surgical drainage is reserved for patients who do not respond to treatment with percutaneous aspiration or drainage and antibiotics or who have concomitant intra-abdominal disease requiring a surgical intervention¹⁸. Our patient had multiple liver abscesses and improved well after needle aspiration associated with antibiotic treatment.

CONCLUSION

We conclude that even though it is rare, a liver abscess due to *Salmonella* in a PLWHA is a diagnosis that should not be overlooked among the pyogenic causes of liver abscesses and that a careful guided needle aspiration together with an antibiotic treatment is frequently associated with a good prognosis.

CONFLICT OF INTERESTS

There are no financial or other relationships of any kind of the authors that might lead to any conflict of interests.

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