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Case Report

Salmonella enterica and *Entamoeba histolytica* co-infection presenting as multiple liver abscesses in an immunocompetent patient

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ABSTRACT

People living with the human immunodeficiency virus (PLHIV) are likelier to have Salmonella infections and bloodstream invasion than immunocompetent people. Here, we present a case with liver abscess due to co-infection *Entamoeba histolytica* and *Salmonella enterica* with no co-morbidities, immunocompromised states or any alcohol or other substance abuse history. A 36-year-old male with no significant co-morbidities presented with complaints of abdominal pain and fever. On examination, the right hypochondrium was tender without guarding or rigidity. Amoebic serology was positive. Stool culture isolated Salmonella group B and abscess culture revealed *Salmonella enterica*. HIV serology was negative. The ultrasound revealed hepatomegaly, two well-circumscribed abscesses in the liver, with right-sided pleural effusion. The patient was managed with ultrasound-guided pigtail drainage, followed by antibiotic therapy. Even though the co-infection of Salmonella and Entamoeba leads to abscess in immunocompetent individuals, which is rare, we should not overlook the possibility of the diagnosis.

Keywords: Immunocompetent individual, Pigtail drainage, Salmonella and entamoeba co-infection

INTRODUCTION

Liver abscesses are very rare presentations in the current world. Two main etiologies are amebic and pyogenic, with an incidence of one and 11 cases per million persons per year, respectively.[1] Salmonellosis is a significant public health problem in resource-constraint countries. It is a food-borne infection with varying forms, from gastroenteritis to enteric fevers.[2]

Meanwhile, liver abscess as a complication of Salmonella infection is extremely rare and out of the few cases seen, most are in immunocompromised individuals.[3-5] The most common pathogens responsible for pyogenic abscesses in the liver are Streptococci, Staphylococci, *Escherichia coli*, *Klebsiella pneumonia*, Bacteroides and Enterococci.[6] *Entamoeba histolytica* is a protozoan that causes amebiasis and is responsible for approximately 50 million cases and 100,000 deaths worldwide annually. Amoebic colitis and liver abscess development are principal characteristic features.[7] Co-infections with two etiologies become a rarer entity in a combined form. With this, we present a case with liver abscess due to co-infection *Entamoeba histolytica* and *Salmonella enterica* with no co-morbidities, immunocompromised states or any alcohol or other substance abuse history.

CASE REPORT

A 36-years-old male with no significant co-morbidities presented to the hospital with complaints of abdominal pain for eight days and fever for three days. The pain was insidious in onset, localized to the right hypochondrium and right flank, dull aching in nature, moderate in intensity and associated with nausea. The pain was non-radiating, non-migrating and had no specific aggravating or relieving factors. The fever was intermittent and high-grade, accompanied by chills and rigours and was

temporarily relieved by medications. He had a history of weight loss, lethargy and yellowish discolouration of the skin for the past month. There is no history of vomiting, decreased urine output, altered bowel or bladder habits or abdominal trauma.

Figure 1: Contrast-enhanced computed tomography (CECT) portal phase.

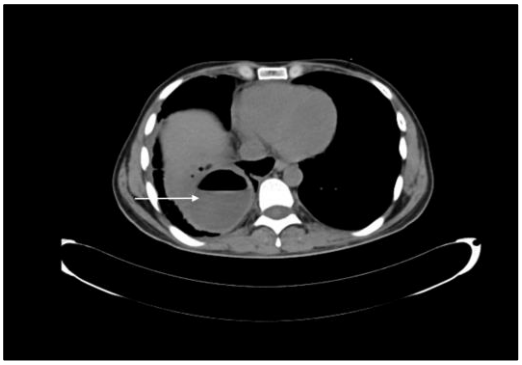

Figure 2: High-resolution computed tomography (HRCT) liver.

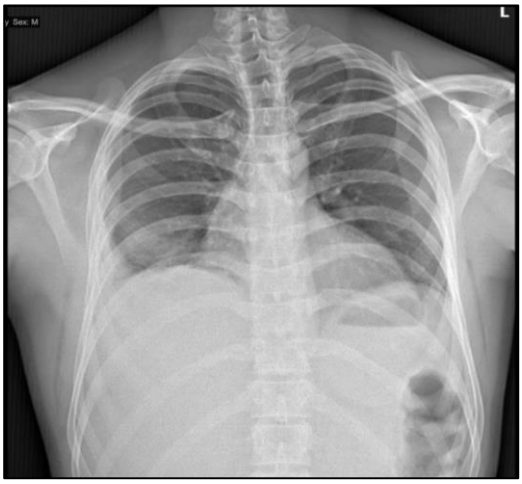

Figure 3: Chest X-ray posteroanterior view before pigtail insertion.

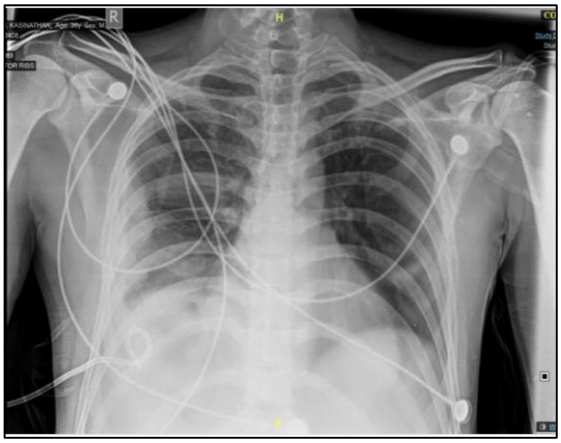

Figure 4: Chest X-ray anteroposterior view after pigtail insertion.

On examination, he was conscious, oriented, febrile and hydrated. Icterus was noted. No signs of pallor, cyanosis, clubbing, lymphadenopathy or pedal oedema. His vital signs were stable: a blood pressure of 104/76 mmHg, a pulse rate of 119 beats per minute and an oxygen saturation of 96% on room air. Systemic examination revealed tenderness in the right hypochondrium without guarding or rigidity. Bowel sounds were normal. Other system examinations were normal.

Laboratory investigations showed mild anaemia, mild leukocytosis and mildly elevated bilirubin levels. Blood cultures revealed amoebic serology positive by immunoglobulin-G enzyme-linked immunosorbent assay (IgG ELISA). Stool culture isolated Salmonella group B and the abscess culture revealed Salmonella enterica. Human immunodeficiency virus (HIV) serology was also negative.

The ultrasonography (USG) report revealed hepatomegaly (enlarged liver measuring 18.3 cm) with multiple ill-defined, heterogeneous hypoechoic areas in segments 6 and 7, the largest measuring 10×6.2×9.6 cm, indicative of liver abscess. No internal vascularity was noted and there was no evidence of intra-hepatic biliary radicular dilation (IHBRD). A computed tomography (CT) scan of the thorax and abdomen revealed two well-circumscribed hypoechoic lesions in segments 6, 7 and 8 of the liver, showing subcapsular extension suggestive of hepatic abscesses. The larger abscess had extended into the right pleural cavity through a diaphragmatic defect, with right-sided pleural effusion (Figure 1-3). The patient was initially managed with ultrasound-guided pigtail drainage of the liver abscess (Figure 4).

The drain culture turned out to be positive for Salmonella enterica. He was also started on non-invasive ventilation (NIV). He was started on empirical antibiotics, including ceftriaxone and metronidazole, but due to clinical deterioration and persistent fever spikes, treatment was escalated to piperacillin-tazobactam. Later, based on the results of the culture sensitivity test, the antibiotics were

changed to co-trimoxazole. He responded to the antimicrobial therapy. His respiratory status improved. He was gradually weaned from NIV to room air. Repeat imaging showed a reduction in the size of the liver abscess. On discharge, he was afebrile, tolerating oral intake and his bowel and bladder functions had returned to normal. He was advised to follow a high-protein diet, practice incentive spirometry and chest physiotherapy and maintain good local hygiene. He was instructed to monitor the output from the pigtail drain and return for follow-up in the surgery outpatient department for pigtail removal and further management. He was also advised to follow up with the pulmonary medicine department for evaluation of the pleural effusion.

DISCUSSION

According to the available literature, non-typhi Salmonella infestations are rarely described in the general population, especially in the developed world. Hepatic abscess, as a presentation, is an even more rare entity. The pathogenesis has been well-defined in patients with HIV.[8] People Living with HIV (PLHIV) are at least 20 times more likely to have Salmonella infections and bloodstream invasion is 100 times more common in them than in immunocompetent people. Despite this, there are few reports of localized or suppurative infections in immunocompromised.[5] Our patient had no co-morbidities like tuberculosis or HIV. He had no history of steroid usage, alcohol addiction, etc, which could render him immunocompromised.

USG of the liver in Salmonella and the amebic abscess usually shows a solitary hypoechoic lesion in the middle or right liver. Meanwhile, the USG of other pyogenic abscesses often shows multiple hypoechoic images.[9,10] In contrast, our patient having culture positive Salmonella positive, USG showed hepatomegaly and multiple hypoechoic lesions. It also showed invasion of the pleura, leading to pleural effusion through a diaphragmatic defect. Modalities like ultrasound or CT-guided aspiration can be used to isolate the causative pathogen.[1] This is a rare case of concurrent Salmonella and amoebic liver abscess in an immunocompetent individual presented with multiple abscesses. Blood and abscess drain cultures were well documented for salmonellosis and serological results in drained abscess for amoebiasis.

The mainstay of treatment of salmonellosis is antibiotic therapy. For Entamoeba abscess, we use metronidazole. The combination of abscess drainage and antimicrobial therapy for treating multiple pyogenic liver abscesses shows a similar efficacy but with a shorter hospitalization time than abscess drainage alone. Percutaneous drainage is recommended for patients with persistent fever even after 72 hours of appropriate medical treatment and aspiration, liver abscesses larger than 6 cm and clinical or ultrasound features of impending perforation. Drainage is recommended before surgery to minimize costs and improve patient comfort. Patients who have concurrent intra-abdominal disease requiring surgical intervention or who do not respond to percutaneous aspiration or drainage combined with antibiotics should be considered for surgical drainage.[11] Here, in our case, we did ultrasound-guided pigtail drainage of the liver abscess, followed by antibiotic therapy using Piperacillin-Tazobactam and Metronidazole.

CONCLUSION

In conclusion, even though the co-infection of Salmonella and Entamoeba leads to an abscess in immunocompetent individuals, which is rare, we should not overlook the possibility of the diagnosis. Proper laboratory and imaging investigations should be done to rule out such conditions. A good chance of complications like pleural effusion and the requirement of NIV should be kept in mind while treating the patients. USG or CT-guided drainage followed by appropriate antibiotic therapy is associated with a good prognosis and should be the treatment of choice. The empirical treatment should be started as soon as possible and, later on, shift to a specific treatment based on the culture findings.

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