

JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH

How to cite this article :

MUKHOPADHYAY C, RAO P S, SHETTY A K, VIDYASAGAR S, VARMA M. HAEMORRHAGIC PLEURAL EFFUSION IN AN HIV PATIENT WITH *SALMONELLA TYPHIMURIUM*. Journal of Clinical and Diagnostic Research [serial online] 2007 August [cited: 2007 Aug 6];4:299-302.

Available from

[http://www.jcdr.net/back_issues.asp?issn=0973-](http://www.jcdr.net/back_issues.asp?issn=0973-709x&year=2007&month=August&volume=1&issue=4&page=299-302&id=102)

[709x&year=2007&month=August&volume=1&issue=4&page=299-302&id=102](http://www.jcdr.net/back_issues.asp?issn=0973-709x&year=2007&month=August&volume=1&issue=4&page=299-302&id=102)

CASE REPORT

Haemorrhagic Pleural Effusion in an HIV infected patient with *Salmonella typhimurium*

MUKHOPADHYAY C*, RAO P S*, SHETTY A K*, VIDYASAGAR S**, VARMA M**

ABSTRACT

Non-typhoidal salmonellosis is rarely encountered in immunodeficient individuals, including HIV/AIDS, where pleural effusion is an unlikely manifestation as well. Tuberculosis and *Pneumocystis carinii* pneumonia are the two leading causes of pleural effusion, which are mainly non-haemorrhagic. We report a rare case of haemorrhagic pleural effusion in an HIV-positive patient with *Salmonella typhimurium* as the only opportunistic infection. It was diagnosed timely and treated successfully with institution of appropriate antibiotics. *S. typhimurium* is a rare opportunistic infection to cause haemorrhagic pleural effusion in HIV positive patients with decreased CD4+ count.

Background

Infections due to non-typhoidal *Salmonella* have been described in patients with impaired host defences like neoplastic diseases, transplantation, cirrhosis, collagen vascular diseases, renal failure requiring haemodialysis and immunosuppressive therapy [1],[2]. The increased incidence of non-typhoidal salmonellosis in HIV-infected patients was originally noted in early 1980s and became an AIDS-defining complex in 1987 [3]. Disseminated and drug-resistant *Salmonella* infections with higher mortality have started increasing with the advent of AIDS [4],[5]. However, pleural effusion with *Salmonella* infection is not frequent in

HIV/AIDS (2%), where *Mycobacterium tuberculosis* and *P. carinii* are the two most common organisms responsible [6]. *S. typhimurium* is a rare, non-typhoidal salmonella, which was isolated from haemorrhagic pleural effusion in immunocompromised patients, especially in HIV/AIDS.

Case Presentation

A 30-year-old male was diagnosed to have massive right-sided pleural effusion, as he presented with cough, fever, exertional breathlessness and right-sided chest pain. He also had a history of chronic recurrent diarrhoea for last 1 year, which was not investigated. He was started on HAART (lamivudine, stavudine and nevirapine), as he was HIV positive with low CD4⁺ T-cell count (17 cells/mm³). Pleural fluid was exudative with WBC count of 400 cells/mm³ (predominantly lymphocytes), RBC 0.20 million/mm³, glucose 84 mg/dl, protein 6.8 g/dl, LDH 866 U/L and ADA 115 U/L; however, there were no pus cell, malignant

*Department of Microbiology, Kasturba Medical College, Manipal- 576104, Karnataka, India

**Department of Medicine, Kasturba Medical College, Manipal- 576104, Karnataka, India

Corresponding author: Dr. Chiranjay Mukhopadhyay, Associate Professor, Department of Microbiology, Kasturba Medical College, Manipal - 576104, Karnataka, India
Tel.: 91-820-2571201, extn. 22322; fax: 91-08252-571927; e-mail: chiranjay@yahoo.co.in

cell, acid-fast bacilli as well as cyst or trophozoite of *P. carinii* (Giemsa staining). Culture grew no bacteria including *M. tuberculosis*, nor fungi. PCR for *M. tuberculosis* from blood and pleural fluid was negative. Blood, sputum and stool cultures were negative. Pleural biopsy had no evidence of malignancy or tuberculosis. Mantoux test was negative. Based on fever, high ESR, exudative effusion and high ADA level, he was empirically started on ATT. Prophylactic cotrimoxazole therapy was also started. He was discharged as fever subsided and improved symptomatically.

He was readmitted after 2 weeks with fever, increased exertional dyspnoea (grade III) and right-sided chest pain. A chest X-ray showed persisting massive pleural effusion. A repeat pleural tap revealed WBC 320 cells/mm³ with lymphocytosis, RBC 7200 cells/mm³, glucose 36 mg/dl, protein 6.1 g/dl, LDH 810 U/L and ADA 42 U/L. *S. typhimurium* was grown in culture, as confirmed by standard biochemical tests [7] and serotyping with specific antisera (Murex Biotech Limited, UK). The isolate was sensitive to chloramphenicol, ampicillin, cotrimoxazole, ciprofloxacin and ceftriaxone by disk diffusion method [8]. The organism was re-isolated 3 days later with less growth. There was no evidence of mycobacterial infection in pleural tap, and blood, sputum and stool showed similar negative results.

The patient was started treatment with oral ciprofloxacin (1.5 g/day for 14 days) along with HAART and cotrimoxazole. ATT was withdrawn. Patient improved clinically and radiologically on follow-up after 2 weeks, with a little effusion left and with pleural fibrosis.

Discussion

The reported prevalence of pleural effusion among patients hospitalised with AIDS has varied markedly (1.7–18.3%), though most of the studies observed prevalence closure to 2% [9]. The distribution of diseases responsible for pleural effusion in AIDS also varies from series to series – Kaposi's sarcoma, aerobic and anaerobic bacterial pneumonia, tuberculosis and opportunistic infections like *P. carinii* are the common predisposing factors. Haemorrhagic pleural effusion with *S. typhimurium* is rarely encountered. *Salmonella* infection in HIV-positive patients have largely

been limited to non-pulmonary sites, with only few case reports describing patients with cavitary infiltrates, empyema and non-haemorrhagic pleural effusion in immunocompromised patients [10-13]. This is the first documented case from India to the best of our knowledge (5.2 million estimated cases of HIV/AIDS by 2005) [14] where *S. typhimurium* was the only opportunistic infection in the patient with very low CD4 count as isolated from haemorrhagic pleural effusion. There is no clear explanation to how *Salmonella* produced pleural effusion in this patient. The patient in our study had negative blood cultures in two different occasions, ruling out the possibility of haematogenous dissemination, though previous episodes of salmonella bacteraemia are not always a prerequisite. Aspiration of infected gastric secretions does not seem to be the source of infection, since the patient was not on antacids for a long period, which could lead to colonisation of *Salmonella* in oesophagus and stomach from the gallbladder and the upper intestinal tract [2]. Trans-diaphragmatic passage from an abdominal focus of infection could be a rare possibility, since the patient had a history of chronic recurrent diarrhoea, which had never been investigated previously and not been isolated after getting admitted.

The nearly similar presentation of the patient with tuberculosis, a common opportunistic infection in India [14], and *P. carinii* pneumonia created initial diagnosis and treatment conundrum. Absence of acid-fast bacilli in pleural fluid or sputum does not rule out tuberculosis, since the detection rate from each of the samples is only 40–50% in AIDS [14]. The low CD4⁺ count itself decides against the diagnosis of tuberculous pleuritis, which is predominantly due to delayed-type hypersensitivity, rather than direct infection of pleural space. *Salmonella*, on the other hand, has known pathogenetic mechanism of direct endovascular invasion, which is more likely to cause haemorrhagic pleural effusion. *P. carinii* is another unusual cause of pleural effusion, which is almost always associated with patients receiving aerosolised pentamidine. The non-corroborative microbiological, clinical and radiological presentation and relatively high protein level (6.1 g/dl) were helpful to rule out *P. carinii* infection.

Drug resistance against chloramphenicol and quinolones is not uncommon in this part of the world, though not encountered in this case. The young age of the patient might also be a contributing factor for successful outcome, since mortality is high over the age of 60 years, with underlying immunosuppressive disease [2].

In conclusion, *S. typhimurium* is a rare opportunistic infection in AIDS and may lead to haemorrhagic pleural effusion in young patients with CD4 count less than 100 and should be suspected when tuberculosis and *P. carinii* are ruled out. Early diagnosis, appropriate antimicrobial drug therapy and aggressive drainage are necessary to improve the outcome of the patients.

Acknowledgement

We sincerely acknowledge the cooperation of the patient and his relatives during management and we thank them for their helping attitude.

Competing Interests

There is no competing interest, as we interpret data or present information that is not influenced by our personal or financial relationship with other people or organisations. We do not have any financial or non-financial competing interests that may cause any embarrassment after the publication of the manuscript.

Abbreviation

ADA	Adenosine deaminase
AIDS	Acquired immunodeficiency syndrome
ATT	Antitubercular therapy
ESR	Erythrocytic sedimentation rate
HAART	Highly active antiretroviral therapy
HIV	Human immunodeficiency virus
LDH	Lactate dehydrogenase
PCR	Polymerase chain reaction
RBC	Red blood cells
WBC	White blood cells

References

[1] Chen YH, Chen TP, Lu PL, Su YC, Hwang KP, Tsai JJ, et al. *Salmonella choleraesuis* bacteremia in southern Taiwan. *Kaohsiung J Med Sci* 1999;15:202-8.

[2] George S, Sofia M, Charalambos K, Dimitrios M, Vassilios G. *Salmonella enterica* pneumonia in a patient with lung cancer. *J Clin Microbiol* 2004;41:5820-2.

[3] Gordon MA, Banda HT, Gondwe M, Gordon SB, Boeree M, Walsh AL, et al. Non-typhoidal *Salmonella* bacteraemia among HIV-Infected Malawian adults: high mortality and frequent recrudescence. *AIDS* 2002;16:1633-41.

[4] Reba K, Kumar A, Srinivasan S, Badrinath S. Pleural empyema due to Group B *Salmonella* in a child with diarrhea. *Indian Paediatr* 2001;38:186-9.

[5] Lal C, Lee L, Hsueh P, Yu P, Yu C, Yang P. Empyema thoracic from *Salmonella choleraesuis*. *Emerg Infect Dis* 2005;11:1493-4.

[6] Light RW, Hamm H. Pleural disease and acquired immune deficiency syndrome. *Eur Respir J* 1997;10:2638-43.

[7] Koneman EW, Allen SD, Janda WM, Schreckenberger PC, Winn WC. Color atlas and textbook of diagnostic microbiology. 5th ed. New York: Lippincott 1997:171-252.

[8] Wikler MA, Cockerill FR, Craig WA. Performance standards for antimicrobial susceptibility testing; clinical and laboratory standards institute. Fifteenth informal supplement. M100-S15. Vol. 25. No. 1. PA:Wayne 2005.

[9] Nadelman RB, Mathur-Wagh U, Yancovitz SR, Mildvan D. *Salmonella* bacteremia associated with the acquired immunodeficiency syndrome. *Arch Intern Med* 1985;145:1968-71.

[10] Glaser JB, Morton-Kute L, Berger SR, Weber J, Siegal FP, Lopez C, et al. Recurrent *Salmonella typhimurium* bacteremia associated with the acquired immunodeficiency syndrome. *Ann Intern Med* 1985;102:189-93.

[11] Owino EA, McLigeyo SO, Gathua SN, Nyong'o A. Prevalence of human immunodeficiency virus infection: its impact on the diagnostic yields in exudative pleural effusion at the Kenyatta National Hospital, Nairobi. *East Afr Med J* 1996;73:575-8.

[12] Satué JA, Aguado JM, Costa R, Robledo M, De Miguel E, Hernandez J, et al. Pulmonary abscess due to non-typhi *Salmonella* in a patient with AIDS. *Clin Infect Dis* 1994;19:555-6.

[13] Turkan P, Selmin M, Esat K, Musa K. Pleural empyema caused by *Salmonella typhimurium* in a patient with acute lymphoblastic leukemia. *Erciyes Med J* 2003;25:204-7.

[14] Park K. Park's Textbook of preventive and social medicine. Publisher: Banarsidas Bhanot. Jabalpur, India, 19th edn; 2007: 285-96.

