

Case Report

A purulent pericarditis caused by *Salmonella typhimurium*

Fusun Can,¹ Muge Demirbilek,¹ Birsal Erdem,² Ugur Ciftci,³ Mine Tunaoglu³ and Yahya Laleli³

Correspondence
Fusun Can
drfusuncan@yahoo.com

¹Department of Microbiology and Clinical Microbiology, Başkent University School of Medicine, Ankara, Turkey

²Department of Microbiology and Clinical Microbiology, Ankara University School of Medicine, Ankara, Turkey

³Duzen Laboratories, Ankara, Turkey

Received 26 August 2003
Accepted 5 June 2004

A case of *Salmonella typhimurium* pericarditis is reported. The diagnosis was based on blood and pericardial effusion cultures.

Introduction

Salmonellosis is an important health problem worldwide (Haggman *et al.*, 1986). Poor sanitation conditions and lack of careful monitoring of food processing cause large outbreaks of salmonellosis, especially in developing countries. *Salmonella* infections may occur in different clinical forms in humans. Extraintestinal *Salmonella* infections are seen in less than 30 % of cases. Localized infections are an important form of *Salmonella* infection and are frequently seen during salmonella bacteraemia, but may also occur with enteric fever or gastroenteritis. Urinary tract, central nervous system, soft tissue, bone and joint infections due to different *Salmonella* serotypes have been reported previously (Aksoycan *et al.*, 1958; Erler *et al.*, 1994). Although the pericardium is rarely involved, accounting for less than 2 % of cases, the mortality rate is as high as 50 % or more (Cohen *et al.*, 1987).

We describe a case of purulent pericarditis caused by *Salmonella typhimurium*.

Case report

A 42-year-old man was admitted to hospital with a history of fever and dyspnoea. He gave a 2-week history of chest pain, palpitations, nausea and diarrhoea. On examination he was tachycardic and tachypnoeic with a temperature of 38.2 °C, and heart sounds were diminished. Examination of the abdomen showed no organomegaly or ascites. Jugular venous pressure was raised and peripheral oedema was not observed. The white cell count was normal ($8.6 \times 10^9 \text{ l}^{-1}$), the erythrocyte sedimentation rate was 75 mm h⁻¹ and the level of C-reactive protein was 58 mg l⁻¹. He was presented to us with a diagnosis of pericardial effusion demonstrated by transthoracic echocardiography. Pericardiocentesis was carried out and haemorrhagic fluid was drained. Three blood cultures were drawn. The patient died 24 h after he was

admitted to the hospital. Gram-negative rods were seen by Gram staining and lactose-negative colonies grew on EMB agar (Oxoid) after overnight incubation of pericardial fluid culture. *Salmonella* was identified by sugar fermentation and gas and H₂S production on triple-sugar–iron agar and by urea hydrolysis tests. Identification was confirmed by the Vitek identification system (bioMérieux). Slide agglutination with polyvalent antisera for *Salmonella* serogroup O antigen showed that it was included in group B of the Kauffmann–White scheme. Based on the agglutination reactions with specific antisera to O and H antigens the organism was identified as *Salmonella typhimurium*. It was also isolated from blood cultures.

Both of the isolates (from pericardial fluid and blood) were found to be sensitive to ampicillin and ciprofloxacin.

Discussion

With the use of antibiotics in medicine, bacterial infection of the pericardium has become uncommon; however, is still a life-threatening condition (Badawi *et al.*, 2002). Although Gram-positive bacteria such as *Streptococcus pneumoniae*, *Staphylococcus aureus* and *Streptococcus pyogenes* and Gram-negative bacilli are the most important causative agents of bacterial pericarditis, Gram-negative rods are isolated more frequently than Gram-positive bacteria from patients with pericardial infection (Klacsman *et al.*, 1977). Extraintestinal salmonellosis more frequently affects patients with some predisposing factor and/or underlying disease than patients without these features (Rodriguez *et al.*, 1998). Pre-existing pericardial effusion due to uraemia, thoracic surgery and other factors and the immuno-status of patients are important predisposing factors for the development of purulent pericarditis. Transient salmonella bacteraemia from the gastrointestinal tract has also been previously noted (Sabeel *et al.*, 1997). Our patient was known to have pericardial

effusion symptoms at least 2 weeks before his presentation. Gastroenteritis might have preceded the illness and *Salmonella typhimurium* could have entered the pericardium from the blood.

Purulent pericarditis is a rare complication of *Salmonella* infections (Doig *et al.*, 1991). Cohen *et al.* (1936) described the first case of non-typhoidal salmonella pericarditis in a 36-year-old woman in 1936. The majority of cases of salmonella pericarditis were in children in the preantibiotic era; in the antibiotic era the majority of cases are in adults (Cohen *et al.*, 1987).

Salmonella pericarditis cases are diagnosed by either pericardial fluid culture or Gram staining of pericardial fluid. Using these criteria, fewer than 30 non-typhoidal salmonella pericarditis cases have been reported in the literature (Kiughi *et al.*, 1998). In a review of the published literature up until 1987 by Cohen *et al.* (1987), there were 10 cases of non-typhoidal salmonella pericarditis: seven of the patients had positive pericardial fluid cultures during life, and two had positive cultures and one had Gram-negative rods at autopsy. In our case we isolated *Salmonella typhimurium* from both the blood and pericardial fluid cultures. *Salmonella typhimurium* is the most common organism isolated in non-typhoidal suppurative pericarditis, representing about 50 % of the reported cases (Sanchez-Guerrero & Alarcon-Segovia, 1990). Other *Salmonella* serotypes isolated from pericardial fluid in the literature are *Salmonella enteritidis*, *Salmonella paratyphi* A, *Salmonella choleraesuis*, *Salmonella newport*, *Salmonella panama* and *Salmonella paratyphi* D (Victor *et al.*, 1997).

In conclusion, we reported a case of non-typhoidal salmonella pericarditis secondary to bacteraemia in a 42-year-old man. It is a rare complication of *Salmonella* infection and atypical clinical findings in particular cause high mortality rates.

References

- Aksoycan, N., Ozsoylu, S. & Gulmezoglu, E. (1958). *Salmonella muenchen* osteomyelitis in a white boy with sickle cell disease. *Turk J Pediatr* **1**, 162–167.
- Badawi, R., Nageh, T., Walker, D. & Richard, W. (2002). Nontyphoidal salmonella pericarditis: a case of *Salmonella typhimurium* phage type 2 pericarditis. *Int J Cardiol* **82**, 187–189.
- Cohen, J. I., Bartlett, J. A. & Corey, G. R. (1987). Extra-intestinal manifestations of *Salmonella* infections. *Medicine* **66**, 349–388.
- Cohen, L., Fink, H. & Gray, I. (1936). *Salmonella* bacteraemia: with pericarditis, pneumonitis, and pleural effusion. *JAMA (J Am Med Assoc)* **107**, 331–333.
- Doig, J. C., Hilton, C. J. & Reid, D. S. (1991). *Salmonella*: a rare cause of subacute effusive-constrictive pericarditis. *Br Heart J* **65**, 296–297.
- Erlor, F., Aribal, E., Cicioglu, B. & Erdem, B. (1994). *Salmonella typhimurium* isolated from lymphadenitis. *Mikrobiyol Bul* **28**, 118–121.
- Haggman, D. L., Rehm, S. J., Moodie, D. S. & Mackenzie, A. H. (1986). Nontyphoidal *Salmonella* pericarditis: a case report and review of the literature. *Pediatr Infect Dis* **5**, 259–264.
- Kiughi, K., Endo, T., Nejima, J., Okamatsu, K., Takayama, M., Takano, T. & Hayakawa, H. (1998). Purulent pericarditis with tamponade caused by *Salmonella enteritidis*. *Jpn Circ J* **62**, 139–141.
- Klacsman, P. G., Bulkley, B. H. & Hutchins, G. M. (1977). The changed spectrum of purulent pericarditis: an 86 year autopsy experience in 200 patients. *Am J Med* **63**, 666–673.
- Rodriguez, M., de Diego, I. & Mendoza, C. (1998). Extraintestinal salmonellosis in a general hospital (1991 to 1996): relationships between *Salmonella* genomic groups and clinical presentations. *J Clin Microbiol* **36**, 3291–3296.
- Sabeel, A., Alrajhi, A. & Alfurayh, O. (1997). *Salmonella* pericarditis and pericardial effusion in a patient with systemic lupus erythematosus on haemodialysis. *Nephrol Dial Transplant* **12**, 2177–2178.
- Sanchez-Guerrero, J. & Alarcon-Segovia, D. (1990). *Salmonella* pericarditis with tamponade in systemic lupus erythematosus. *Br J Rheumatol* **29**, 69–71.
- Victor, F., Gras, D., Le Breton, H., Gras, S. & Amelot, J. (1997). *Salmonella* pericarditis: a case report and review of the literature. *Arch Mal Coeur Vaiss* **90**, 301–303.