



# Journal of Medical Sciences

ISSN 1682-4474

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**JMS (ISSN 1682-4474) is an International, peer-reviewed scientific journal that publishes original article in experimental & clinical medicine and related disciplines such as molecular biology, biochemistry, genetics, biophysics, bio-and medical technology. JMS is issued six times per year on paper and in electronic format.**

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## ***Salmonella gallinarum* Empyema-The First Case from Iran**

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*Salmonella gallinarum* infection primarily causes disease in chickens and turkeys, but, ducks, pheasants, peafowl and quail can be affected. *Salmonella gallinarum* is the cause of fowl typhoid with almost 100% mortality. However, to our knowledge, there is no report of such infection in human subjects. Herein, we report a 24-year-old man with empyema due to *S. gallinarum*. It is believe that this is the first report of its kind not only in the Iran but also in the world.

**Key words:** *Salmonella gallinarum* empyema, Iran

## INTRODUCTION

*Salmonellae* are gram-negative, facultatively anaerobic bacilli. Foods of animal origin including meat and poultry eggs or dairy products can become contaminated with *Salmonella* (Miller and David, 2000; Thamilikitkul *et al.*, 1996; Anonymous, 2000). *Salmonella* gastroenteritis is usually a self-limited disease. Although bacteremia develops in less than 5% of all patients with *Salmonella* gastroenteritis, certain patients including; persons with organ transplantation, lymphoproliferative disease and AIDS patients are at increased risk for invasive infection (Miller and David, 2000; Thamilikitkul *et al.*, 1996; Jong *et al.*, 1998). *Salmonella gallinarum* is the cause of fowl typhoid. Due to extensive testing and control by the poultry products, fowl typhoid is rare in countries with a modern poultry industry. The disease has gained incidence in south America, Africa and Asia. This bacteria limits itself to avian species and is not known to cause disease in humans (Jordan and Pattison, 1996). But non-typhoidal *Salmonella* bacteremia has been previously reported in AIDS patients (Altare *et al.*, 1998; Jong *et al.*, 1998; Gordon, 2002). Also, *Salmonella gallinarum* septicaemia in human have been reported in two apparently immunocompetent hosts (Chiu *et al.*, 1999). However, to our knowledge, there is no any report of *Salmonella gallinarum* empyema in human. This report describes a patient with *Salmonella gallinarum* empyema. According to our available data, we believe this is the first report of its kind not only in Iran but also in the world.

## CASE REPORT

A 24-year-old man was admitted to the Boalishospital in Zahedan (a city in Southeast of Iran) on September 2004 because of fever, headache and abdominal discomfort. On Physical examination, he appeared ill and toxic with a temperature of 39.4°C. On examination, blood pressure of 122/75, heart rate of 102 and a respiration rare of 25 per minute with an oxygen saturation of 95% while breathing room air. She was ill-appearing. Cardiovascular examinations were normal as were cranial nerves and neurologic examinations but there was a decreased pulmonary sound in right hemithorax. Erythrocyte sedimentation rate was 70 mm h<sup>-1</sup> and hemoglobin concentration had decreased to 9.8 g dL<sup>-1</sup>. Platelet, leukocytes, reticulocyte count were normal. Plain chest-xray and CT scan showed loculated pleural effusion at the right costophrenic angle. Ultrasound-guided paracentesis of pleural fluid was

performed. (Protein concentration: 7.8 mg dL<sup>-1</sup>; WBC: high, with 100% neutrophil; sugar concentration <20 mg dL<sup>-1</sup>; RBC: high; LDH>10000 IU L<sup>-1</sup>; PH:7.09; ADA:427 IU L<sup>-1</sup>). Normal results were obtained in all immunologic test including flow cytometry for CD3+, CD4+, CD8+, CD19+, CD56+, CD11a+, CD11b+, CD11c+, CD18+, CD 28+, CD80+, CD86+ and CD119+ molecules, neutrophil chemotaxis, NBT, serum immunoglobulin and complement levels. Serologic assays and PCR for HIV, HCV, HBV were negative. He was fully vaccinated. The tuberculin test was negative. He had a positive family history for tuberculosis. Also, in his past history, there was 2 courses of treatments for pulmonary tuberculosis at 18 years of age and at the age of 21 for relapse of pulmonary tuberculosis. Urinalysis was normal. Urine culture was negative but blood and pleural fluid cultures were positive for *S. gallinarum*. He was treated with ceftriaxon and oral ciproflaxacin for 21 days and chest tube was done. The above data clearly demonstrate that the our patients had no immunosuppression, especially cell mediated immunity but he was involved *Salmonella gallinarum* empyema.

## DISCUSSION

*Salmonella gallinarum* infection primarily causes disease in chickens, turkeys and other birds. It causes fowl typhoid and now this disease is rare in developed countries. Canada and Unite States are presently free of the disease (Miller and Davidm, 2000; De *et al.*, 1998). The infection and disease has gained incidence in south America and other countries throughout Africa and Asia in recent years. Outbreaks are characterizes by increased mortality, anorexia and a drop in egg production. Egg transmission may lead to increased dead or weak chicks. Recovered birds may be carriers (Jordan *et al.*, 1996). Southeast of Iran is an endemic area for non-typhoidal salmonellosis. Sometimes bacteremia due to non-typhoidal *Salmonella* occurs but patients with impaired cell-mediated immunity are at risk (Altare *et al.*, 1998; Soichi *et al.*, 1998). Disseminated non-typhoidal *Salmonella* infection have been previously in AIDS patients (Chiu *et al.*, 1999). In other report in 2001, two cases of *Salmonella gallinarum* septicaemia in two apparently immunocompetent patients have been reported. These cases were both from the Indo-Pakistan subcontinent and developed a septicaemic illness following TAB vaccination in Saudi Arabia (Yousuf *et al.*, 2001). Our patient was apparently immunocompetent because immunologic assays were normal. The course of illness was protracted with positive widal test and growth of nonmotile *Salmonella* on extended incubation of blood

and pleural sample cultures. Patients survived with slow response to a combination of ceftriaxon and ciprofloxacin as guided by the antibiotic sensitivity results. It is recommended that in any non typhoidal salmonellosis with protracted course, *Salmonella gallinarum* infection and a typical presentation should be kept in mind.

#### ACKNOWLEDGMENTS

We would like to thank all laboratory staff in Tehran and Zahedan.

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