Acute Renal Failure Secondary to Myoglobinurinia Associated with Legionnaires' Disease*

Sue L. Hall, M.D.; Mark Wasserman, B.A.; Laurence Dall, M.D.;† and Timothy Schubert, M.D.‡

A case of nonfatal Legionnaires' disease was complicated by rhabdomyolysis, myoglobinuria, and acute nonoliguric renal failure. It was not determined whether the rhabdomyolysis was secondary to direct toxic effect of the organism or due to a circulating factor causing muscle necrosis. This case provides additional evidence that rhabdomyolysis with subsequent renal failure may be a serious complication of Legionnaires' disease.

Since the discovery of Legionella pneumophila as the etiologic agent of Legionnaires' disease, many cases of multisystem disease have been reported. There is a wide spectrum of extrapulmonary involvement that includes the renal, gastrointestinal, musculoskeletal, and central nervous systems. Although renal failure occurs in 15 percent of cases, only one case of rhabdomyolysis and myoglobinuria has previously been reported, and in this case, renal failure did not occur.

A case of nonfatal Legionnaires' disease was associated with pneumonia, rhabdomyolysis, myoglobinuria, and acute nonoliguric renal failure.

CASE REPORT

A previously healthy, 26-year-old black man was admitted to the hospital in September 1982 with a four-day history of fever, headache, and myalgias. Since becoming ill, the patient had taken acetaminophen, 1 to 2 tablets every four hours. He had consumed four beers a day for the past eight months, most recently two days prior to admission. He smoked one-half pack of cigarettes daily for 16 years.

On admission to the hospital, his temperature was 39.9°C, blood pressure was 130/70 mm Hg, pulse rate was 120 beats per minute, and respiratory rate was 30 per minute. Physical examination was unremarkable, except for arm and thigh muscles which were tender but without appreciable edema, erythema, or weakness. Lungs were clear to auscultation.

Laboratory evaluation revealed the following values: hematocrit, 45.2 percent; white blood cell count, 11,200 cells/mm³ with 60 polys, 16 bands, 5 lymphs, 19 monos, and normal platelet estimate. Serum electrolytes were normal, BUN value was 20 mg/dl, serum creatinine level was 2.3 mg/dl, and liver function tests were mildly elevated. Urinalysis revealed hematuria, proteinuria, and cylinduria. The chest roentgenogram showed a hazy 3.5 cm density in the right base.

On the second day, the chest roentgenogram showed progression of the right lower lobe infiltrate, and the patient was mildly hypoxemic on room air. Bacterial cultures and viral titers were negative, as were the monospot test, febrile agglutinins, cold agglutinins, ANA, and hepatitis screen. Legionella serology was drawn.

The presumptive diagnosis of Legionnaires' disease was made, and erythromycin, 500 mg intravenously every six hours, was begun. The patient remained febrile, and on the second day, became hypertensive; vigorous intravenous fluid replacement was begun. Within 24 hours, the BUN level rose to 47 mg/dl, and creatinine value to 5.1 mg/dl. Repeat urinalysis showed brown urine with continuing hematuria, proteinuria, and cylinduria. The CPK on day 3 was 108,400 U/L, all muscular fraction, rose to a peak of 165,600 U/L, then returned to normal as the patient recovered. Urine immunoelectrophoresis was positive for myoglobin on day 4 and again on day 14. Serum aldolase level was 104 mIU/ml (normal 1.5 to 8.1), and serum myoglobin value was greater than 250 ng/ml (normal 6 to 85). The sickledex prep was positive, and hemoglobin electrophoresis verified presence of sickle cell trait (SA hemoglobin). The patient refused to have a muscle biopsy performed.

The daily urine output remained 1,000 ml or greater, but hemodialysis was begun when the BUN level reached 122 mg/dl, and creatinine level was 17.7 mg/dl. The patient was discharged on the 30th day after dialysis was no longer necessary; he had received three weeks of erythromycin therapy. At discharge, BUN level was 59 mg/dl, and creatinine level, 5.2 mg/dl; at follow-up, BUN value was 25 mg/dl, and creatinine value, 1.2 mg/dl (Fig 1). Indirect fluorescent antibody testing of the patient's serum against a polyvalent antigen with serogroups 1 to 4 of Legionella pneumophila was <1:64 on day 5 and positive at 1:512 on day 15. Serogroup identification, done by the Center for Disease Control in Atlanta, showed both serogroups 1 and 4 to be positive at 1:512.

COMMENT

Mild impairments of renal function are far more common than renal failure in Legionnaires' disease (LD). Tsai et al. found that initial urinalysis among 123 patients hospitalized with LD in the first known epidemic of the disease in Philadelphia in 1976 showed 3+ or greater proteinuria in 25 percent of cases, and hematuria in 40 percent. In this series, 18 of 123 patients (15 percent) developed acute renal failure, usually after an episode of hypotension and shock. Englund et al. found that 49 of 392 patients (13 percent) in their series had renal failure requiring dialysis during the course of their illness.

The pathogenesis of renal failure in LD is unclear, and pathologic lesions of the kidney at biopsy or autopsy which have been associated with renal failure include acute tubular necrosis, tubulointerstitial nephritis, and pyelonephritis with abscess formation. Myoglobinuria has been suggested by Kurtz, Williams et al., and Friedman as a possible cause of renal failure in LD. Meyer et al. described a patient with LD and chronic renal failure who developed rhabdomyolysis. A case of rhabdomyolysis with myoglobinuria without renal failure in LD has also been reported.
The pathogenesis of rhabdomyolysis in LD is as yet uncertain. That high fever seen with LD could cause muscle cramps leading to myoglobinuria is one possibility, as extreme hyperthermia is known to cause skeletal muscle necrosis and secondarily renal failure. It is more likely that rhabdomyolysis results from some effect of the causative organism itself, either direct invasion of the muscle or due to an endotoxin-like effect of the bacterium. The primary site of infection in LD is thought to be the lung, with hematogenous spread of the organism occurring to extrathoracic sites as documented by identification of the organism in blood, liver, spleen, kidney, and myocardium.

In the case of rhabdomyolysis in a patient with LD previously described, no organisms were found in the muscle, suggesting that the changes in skeletal muscle are due to a circulating factor causing muscle necrosis. This case provides additional evidence that rhabdomyolysis with subsequent renal failure may be a serious complication of Legionnaires’ disease.

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Bronchorrhea*
A Presenting Feature of Active Endobronchial Tuberculosis

S. Y. So, M. B., F.C.C.P.; W. K. Lam, M. B., F.C.C.P.; and M. K. Sham, M. B.

A 32-year-old woman presented with a one-month history of bronchorrhea (500 ml daily). She had normal findings on chest roentgenogram, and negative results for malignant cells and acid-fast bacilli in the sputum. Fiberoptic bronchoscopic examination, however, showed subtotal obliteration of left main bronchus due to active tuberculosis. The protean manifestations of endobronchial tuberculosis and its association with bronchorrhea are stressed.

Bronchorrhea, defined arbitrarily as the production of more than 100 ml of sputum daily, is either idiopathic (mucous catarrh) or secondary to alveolar cell carcinoma, chronic bronchitis or asthma. Its association with tuberculosis has received little attention. Authors such as Crofton and Douglas, Fishman, Hinshaw and Murray, for example, did not mention the association in their textbooks. We report here a patient presenting with bronchorrhea associated with a normal chest roentgenogram and found that she had endobronchial tuberculosis.

CASE REPORT

A 32-year-old community nurse was referred to us in February, 1983 because of low-grade fever and cough with mucoid sputum for five months. Sputum became copious in the last month, amounting to 500 ml daily. There was no hemoptysis. She also complained of anorexia, weight loss of 3 kg, and occasional wheezing over the left side of the chest. Repeated sputum examinations for pyogenic bacteria, acid-fast bacilli, and malignant cells were negative. Many chest roentgenograms were taken, but no abnormality was found. She was treated with various broad-spectrum antimicrobial and bronchodilator drugs and antihistamines without improvement. She was a nonsmoker. There was no previous history of chronic cough or asthma, and no known exposure to tuberculosis.

On examination, she was afebrile. Wheeze could be heard over the left side of the chest only with forced expiration. Sputum was frothy and mucoid with 200 ml produced daily (Fig 1). It contained no pus cells, eosinophils or malignant cells. No pathogen was found on culture of sputum and no acid-fast bacilli were found with rhodamine-auramine stain. Chest roentgenogram was normal (Fig 2).

*From the Department of Medicine, University of Hong Kong, Hong Kong.