Salmonella Urosepsis Complicated by Metastatic Osteomyelitis of the Chest Wall

Carl V. Vartian

Although tens of thousands of Salmonella infections occur annually in this country, most involve the gastrointestinal tract with involvement of the urinary tract being quite infrequent.1-3 I would like to report a case of urosepsis due to Salmonella with eventual development of metastatic osteomyelitis of a rib that proved refractory to treatment.

A 59-year-old Latin American male who resided in the Texas Rio Grande Valley presented to an emergency room with inability to void, having first noted a decreased urinary stream and dribbling a few months earlier. In-and-out bladder catheterization yielded 700 cc of urine, and he was sent out on co-trimoxazole one double-strength tablet twice daily. The patient returned within several hours, again unable to void, and a Foley catheter was inserted draining 1100 cc of urine. The patient was admitted for further evaluation.

Past history was notable for long-standing inflammatory arthritis treated with injectable gold, hydroxychloroquine and nonsteroidal anti-inflammatory agents. He had previously undergone left shoulder replacement and synovectomy of both knees. Diabetes mellitus was diagnosed 6 years earlier and treated with oral hypoglycemic agents. The patient denied any gastrointestinal complaints.

Examination was notable for a temperature of 102.4°F and obvious sequelae of long-standing rheumatoid arthritis. The abdomen was entirely benign, but rectal examination revealed an enlarged, nontender prostate. White blood cell count was 11,200/mm³. Urinalysis revealed 10-12 white blood cells per high power field and 15-20 red blood cells per high power field. Two blood cultures from admission grew Salmonella species sensitive to all antibiotics. Urine cultured at the time of admission remained sterile.

The patient was treated initially with tobramycin and ciprofloxacin and was changed to ceftriaxone 1 g intravenously every 12 hr when the Salmonella was identified. Ultrasound examination confirmed an enlarged prostate but disclosed no ureteral or renal abnormalities. Intravenous pyelogram also revealed the enlarged prostate but was otherwise unremarkable. On the ninth hospital day a transurethral resection of the prostate (TURP) was performed with histologic evidence of abscesses containing acute inflammatory cells in the resected tissue. The tissue itself was culture negative. He gradually defervesced and completed a 14-day course of parenteral therapy.

The patient did well for about 6 months at which point he developed anterior chest wall pain for which he applied a heating pad. A second degree burn developed which ulcerated and began to drain. Culture revealed Salmonella species with a similar sensitivity pattern as the previous isolate. Local care as well as courses of oral ciprofloxacin and chloramphenicol failed to eradicate the drainage. The patient underwent surgical excision of the sinus tract 11 months after the initial bacteremia. Surgical specimens again grew Salmonella. Unfortunately, neither this nor the previous chest wall isolate was saved for further analysis. The area continued to drain and bone scan was consistent with osteomyelitis of the left sixth rib. Ceftriaxone 2 g intravenously per day was begun.

The following month (16 months after the initial bacteremia) the patient underwent extensive debridement of the anterior chest wall with removal of the sixth and seventh ribs, and closure via a pectoralis myocutaneous flap. Forty-eight postoperatively, the patient suffered an acute myocardial infarction and expired. Post-mortem revealed severe coronary artery disease. No additional focus of Salmonella infection was found.

Discussion

Although extraintestinal involvement by Salmonella is well known, infection of the urinary tract is uncommon.2-5 In a series of 7779 Salmonella infections reported by Saphra and Winter,7 49 (0.6%) involved the urinary tract, in some cases limited to the prostate. In a review of Salmonella infections from the Mayo Clinic, a patient with benign prostatic hypertrophy who had undergone a TURP had Salmonella isolated from the urine.8 Mitchell9 reported five cases of Salmonella urinary tract infection, two of whom presented with urinary retention secondary to prostatic disease. In their review of extraintestinal Salmonella infections, Cohen et al.10 note the fact that most cases of urinary tract involvement occur in immunocompromised hosts or in those with stones or structural anomalies of the urinary tract.

Carl V. Vartian, MD: Infectious Diseases Program, Memorial Hospital System, Houston, Texas.
Reprint requests: Dr. Carl V. Vartian, 7777 Southwest Freeway, Suite 740, Houston, Texas 77074.
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A chronic urinary carrier state with *Salmonella* has also been described, especially in individuals co-infected with *Schistosoma haematobium*. These patients can also develop intermittent bacteremia, and treatment of the schistosomiasis as well as the salmonellosis is necessary for eradication of the dual infection.

Osteomyelitis is a known metastatic complication of *Salmonella* bacteremia. Risk factors include hemoglobinopathy (especially sickle cell anemia), diabetes mellitus, corticosteroid therapy, and underlying bone disease or trauma to the affected area. Although medical therapy is often successful, chronic osteomyelitis may require surgical debridement of the involved bone.

The patient reported here had long-standing rheumatoid arthritis and diabetes mellitus. He lived near the United States-Mexican border, but the exact source of the *Salmonella* could not be determined. Given the lack of any recent gastrointestinal symptoms, he may have been a chronic urinary carrier. Only following urinary instrumentation did he become bacteremic. Possible explanations for the sterile urine culture include prior antimicrobial therapy given at the time of his earlier bladder catheterization, or involvement of the prostate rather than the bladder, a finding supported by the histologic abscess formation within the resected prostatic tissue. Although the *Salmonella* isolates were not available for direct comparison, it seems unlikely that this patient would have two separate infections.

In summary, a case of *Salmonella* bacteremia from prostatitis is described. Despite treatment of the acute infection, metastatic involvement of a rib occurred and progressed to chronic osteomyelitis. The patient required extensive debridement and died of a myocardial infarction in the postoperative period.

**References**