

## Salmonella Induced Myocarditis

### Background

Myocarditis has an annual incidence of 0.02% and can be contributed to about 10% of unexplained cardiomyopathy cases. Myocarditis is frequently attributed to infectious agents, but inflammatory myocarditis caused by non-viral causes is seldom seen.

### Case Presentation

A 57-year-old woman on chronic immunosuppression for rheumatoid arthritis was found to be in shock and severely dehydrated with a blood pressure of 70/40 and heart rate of 122 bpm. Laboratory workup was significant for leukocytosis, elevated procalcitonin (13.7), elevated lactic acid (2.6), and troponin elevation with a peak of 108 (ng/mL). An initial electrocardiogram showed diffuse ST-segment elevations. Stool multiplex PCR and stool culture revealed *Salmonella* species. Echocardiogram showed an ejection fraction of 35-40% with global hypokinesia. The patient's shock was complicated with multiple organ failure manifested as acute renal failure and shock liver. She required maximal pressor support with 3 medications (norepinephrine, dopamine and vasopressin). She received stress dose steroids in addition to ceftriaxone for the *Salmonella* infection. Ultimately, she received a right internal jugular vein temporary vascular catheter to initiate renal replacement therapy. Eventually, she began to clinically improve. Her antimicrobial regimen was modified to meropenem and ciprofloxacin. The patient improved significantly, was extubated and her blood pressure support medications were discontinued. Repeat echocardiogram showed improvement of her ejection fraction to 40-45%.

### Discussion

Myocarditis occurring almost at the onset of bacterial gastroenteritis has been rarely reported in the literature, with *Campylobacter* and *Salmonella* spp. being the main responsible bacteria. *Salmonella* more commonly causes endocarditis, although autopsy case reports of *Salmonella* endocarditis have revealed that the myocardium is often involved in the inflammatory process. *Salmonella*-associated myocarditis has been described in rare but increasing numbers of case reports, possibly reflecting its recognition and learned association with myocarditis or improved diagnostics. In cases of myopericarditis, such as in this patient, standard therapies for pericarditis and management of myocarditis-associated arrhythmias are indicated. Due to multi-drug resistance, fluoroquinolones and third generation cephalosporins are first-line empirical agents. Relapsing bacteremia following a therapeutic course should prompt investigations to rule out endocarditis or other endovascular infections. Myocarditis and pericarditis are extremely uncommon presentations of salmonellosis. The lack of clinical suspicion of and the high percentage of self-limited clinical course contribute to the underestimation of the true incidence of myocarditis in general.