

Introduction

Infection with *Vibrio vulnificus* is the leading cause of death related to seafood consumption in the United States (1). *V. vulnificus* is a virulent gram-negative rod that can cause two distinct syndromes, septicemia and necrotizing wound infections.

The consumption of raw or undercooked seafood, often oysters, can cause bacteremia and sepsis with fatality rates being >50% (1). *V. vulnificus* can also cause severe necrotizing wound infections when an open wound is exposed to seawater with high concentrations of the bacteria which can lead to necrotizing fasciitis and death (1). Skin symptoms can be accompanied by fever and chills and is often followed by progression to bacteremia and septic shock. (5,6).

Patients with *V. vulnificus* often require intensive care with aggressive and prompt surgical debridement of wounds and early amputation has been shown to reduce mortality (7,8). Here we present a case of a 51-year-old female with a history of alcoholic hepatitis and decompensated cirrhosis secondary to alcohol and NASH complicated by ascites and esophageal varices who was transferred to TJUH with multi-organ failure and septic shock in the setting of gram-negative sepsis, later found to have *V. vulnificus* bacteremia which led to her death.

Case Presentation

The patient is a 51-year-old female with a history of hypertension, alcoholic hepatitis, and decompensated cirrhosis secondary to alcohol and NASH which is complicated by recurrent ascites and esophageal varices. Over the span of 1 day she developed increased abdominal distension and lower extremity edema, bruising over lower extremities and abdomen, shortness of breath, dark tarry stools, and fever to 102 which prompted her to present to the emergency department.

On presentation she was afebrile, HR 118, BP 134/49, satting 100% on room air. Labs significant for Na 122, Cr 1.5, bicarb 9, glucose 43, WBC 9, Hgb 13.5, plts 138, TB 6.8, AST 132, ALT 53, ALP 67, INR 13.1, pH 7.17, lactate 13. Shortly after arrival patient had cardiac arrest and ROSC was achieved after 1 round of chest compressions. She was sent to the ICU on 3 pressors, a bicarbonate infusion, protonix infusion, octreotide infusion, and broad spectrum antibiotics with vancomycin and zosyn.



Figure 1. Abdominal and lower extremity necrotizing skin wounds in a patient with *V. vulnificus* bacteremia

Blood cultures drawn on admission were positive for gram negative rods, and she was transferred to our hospital two days after initial presentation in multi-organ failure. Upon transfer her exam revealed hemorrhagic bullae over abdomen and extremities (Figure 1). Her shock and multi-organ failure was initially thought to be from gram negative sepsis from spontaneous bacterial peritonitis vs urinary source and her wounds were thought to be purpura fulminans from DIC until her blood culture results drawn on initial presentation grew *Vibrio vulnificus*.

Upon further questioning of family patient had eaten shrimp, oysters, and sushi three days prior to admission. Antibiotics were transitioned to doxycycline and cefepime and surgery was consulted for evaluation of necrotizing wounds. The surgery team felt the patient would require bilateral above the knee amputations, a panniculectomy, and an exploratory laparotomy with possible intra-abdominal debridement all of which would likely not be lifesaving in the setting of her severe multi-organ failure and shock. Patient ultimately developed progressive shock, lactic acidosis, and coagulopathy and died. Prior to her death labs were sent to evaluate for HFE gene mutation in the setting of elevated ferritin and severe *v. vulnificus* infection and came back negative.

Discussion and Significance

This deadly case of *V. vulnificus* demonstrates the severity and rapid progression of infection in patients with underlying chronic liver disease.

The prognosis of *V. vulnificus* infection is linked to the timing to diagnosis and treatment. A delay in treatment of just 24 hours can significantly increase mortality rates and studies have shown that patients who have treatment delayed for 72 hours have a mortality of 100% (5). Patients with underlying immunocompromising conditions are at increased risk of severe infection and death from *V. vulnificus* and approximately 80% of patients who die from *V. vulnificus* infections have underlying chronic liver disease. Studies have shown that patients with liver disease who die from *V. vulnificus* infections often have iron overload and studies demonstrate environments with high levels of free iron have increased growth and lethality of *V. vulnificus* (3, 4,9).

While data demonstrates the high mortality of *V. vulnificus* infections, it is not seen commonly in practice. *V. vulnificus* is not covered by typical broad-spectrum antibiotic coverage and delay in onset of treatment, even by enough time for a blood culture to speciate as *V. vulnificus*, dramatically increases mortality. *V. vulnificus* infection is important to keep on the differential diagnosis in any patient with gram negative sepsis, necrotizing skin wounds, and a history of underlying liver disease or iron overload, and questions about raw seafood and swimming in sea water should be routinely asked to help guide clinicians to an early diagnosis of *V. vulnificus*. This case demonstrates a classic presentation of an uncommon infection and suggests that the clinician must have a high index of suspicion to diagnosis and consider empirically treating for a *V. vulnificus* infection.

References

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