



## Management of the patient with suspected *Vibrio* infection

### Key Article

King M, Rose L, Fraimow H, Nagori M, Danish M, Doktor K. *Vibrio vulnificus* Infections from a Previously Nonendemic Area. *Ann Intern Med.* 2019;

Daniels NA. *Vibrio vulnificus* oysters: pearls and perils. *Clin Infect Dis.* 2011;52(6):788-92.

**Patient evaluation:** 54-year-old male with a h/o unknown, “liver problems” presents to the ED with leg pain. Was on a family vacation in Delaware and returned to Philadelphia yesterday when he developed leg pain and acutely worsening nausea/vomiting/diarrhea. Patient was febrile & hypotensive on arrival with a swollen, erythematous right calf that was indurated and ecchymotic. Surgery was consulted immediately for a possible necrotizing soft tissue infection.

### Background & Infectious Characteristics

- *Vibrio vulnificus* is a gram-neg rod bacteria that lives in bodies of salt-water
- Case fatality rate > 50%
- Leading cause for seafood-related deaths in the US
  - Causes an estimated 80,000 illnesses & 100 deaths in the US every year
- Organism lives in tissues of oysters (most common), clams, mussels, crabs, and other crustaceans.
- Location:
  - Most common in Gulf of Mexico, but increasing prevalence nationally
  - Notable increase in northeast/mid-Atlantic (Delaware, Maryland this year)
  - Warmer water temperature increases risk (pay attention in the summer!) as bacterial densities are highest when the water temp is > 70 degrees F.
- Beware of raw & undercooked shellfish – known to increase risk of not only vibrio, but also *Salmonella*, *Typhi*, and viral pathogens *Hepatitis A* and *caliciviruses*. **Vibrio is the most lethal infection associated with consumption of raw oysters.**
- *Vibrio vulnificus* is an opportunistic infection, particularly in those with
  - Liver disease: Cirrhosis (\*), alcoholic liver disease, HVB, HCV – 80 times more likely to develop infection
    - Patients with portal hypertension
    - Elevated serum iron levels
  - Hemochromatosis
  - Renal disease, diabetes, with immunosuppression
- Interesting prevention facts
  - CDC recommends physicians warn patients w/ liver disease to avoid raw oysters
  - California has been aggressive about *vibrio* prevention, as they have banned importation of raw oysters from the Gulf of Mexico April 1 – October 31<sup>st</sup>!

- Increasing climate temperatures are causing sea surface temperatures to rise in the summer, resulting in non-endemic areas to develop *V vulnificus*.

### Clinical Characteristics

- 3 distinct syndromes, diagnosis usually confirmed with routine blood cultures or tissue cultures
  - Wound infections (45%)
  - Primary Septicemia (43%)
  - GI limited infections (5%)
- Over 95% of primary septicemia cases report consumption of raw or undercooked oysters < 7 days prior to onset
- Wound infections
  - Often necrotizing soft-tissue infections
  - Occur when open wound is exposed to warm seawater or seafood drippings
  - Characteristic skin lesions: LE cellulitis with ecchymosis (*V. vulnificus* also produces extracellular toxins, which destroy tissue and basement membranes in blood vessels), and bullae that occur within 24 hours of onset of illness
- GI infection: Usually self-limited with very few deaths reported
- Symptoms: Fever/chills, diarrhea, vomiting (think cholera-like presentation), septic shock

### Treatment

- Vibrio-Associated Sepsis: Usual sepsis care to start
- Short incubation period and progression of disease is RAPID
- *Early antibiotics within 24 hours of illness onset* may decrease mortality to 33%, compared to:
  - 50% if given within 24-48 hours
  - 100% > 72 hours in one large case series
- Antibiotic choice:
  - Broad-spectrum PLUS doxycycline
  - Clinically, this probably means Vancomycin + 3+ generation cephalosporin (Cefepime/Ceftaz) + Doxy IV or Ciprofloxacin
    - Doxycycline dose: 100mg IV BID
- Aggressive surgical debridement in patients with necrotizing soft tissue infection
- Adjunctive tx: Consider early hematology consultation for initiation of iron chelation therapy with deferoxamine
  - Some data that combined cipro/deferoxamine therapy is synergistic – and clinically superior to abx therapy alone.

### Patient Conclusion

- Patient's tissue cultures were (+) for *Vibrio vulnificus* and ciprofloxacin/deferoxamine therapy was initiated on hospital day 2. A new diagnosis of hemochromatosis was

eventually made. Long hospital course but patient did recover with a right below the knee amputation.