EM CASE OF THE WEEK

BROWARD HEALTH

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Foodborne Illness

A 23-year-old female presents to the ED with abdominal pain and vomiting. Symptoms began last evening following a steak and mashed potatoes dinner. Patient states the abdominal pain is in her lower abdominal area. The pain is an 8/10, made worse with vomiting and changing position. The patient also endorses having watery stools with increased frequency since last evening. The patient denies tobacco use, admits to mild alcohol use, and discloses unknown amount of marijuana use. On physical examination there is epigastric and lower abdominal tenderness to palpation. Blood pressure is 95/52, the remaining vitals are within normal range. Labs demonstrate a WBC count of 14.1 and a +1 hemolysis index. What is the best next step in treatment?

A. Gather a stool sample

B. IV Fluid resuscitation

C. Administration of Ciprofloxacin

D. Administer Ondansetron

E. Discharge the patient, the illness is self-limiting

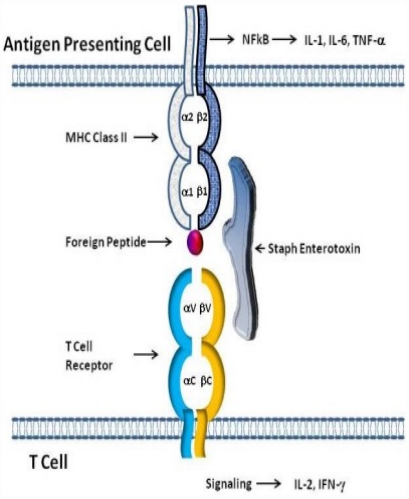

Figure 1. From Pinchuk, Irina V et al. "Staphylococcal enterotoxins." Toxins vol. 2,8 (2010): 2177-97. doi:10.3390/toxins2082177

Differential:
Preformed Toxins- Staph Aureus or Bacillus Cereus
Gastroenteritis- Viral/Bacterial
Cannabinoid Hyperemesis Syndrome
Hyperemesis Gravidarum/ Pregnancy

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Discussion

Answer: B. Most foodborne illnesses are self-limiting; however, frequent episodes of vomiting and diarrhea can deplete total body water leading to dehydration and hypotension, as was depicted in this patient. IV fluids should be given to help prevent further volume depletion and subsequent organ hypoperfusion. Antibiotics are not generally used to treat gastroenteritis but can be considered if there is concern for an invasive infection (*Shigella, Campylobacter, E. coli, Yersinia, Vibrio*).

Types of Foodborne Diseases

Preformed Toxins:
When foods are not stored properly, bacteria like *Staphylococcus aureus* and *Bacillus cereus*, to produce preformed enterotoxins. These preformed toxins cause nausea, vomiting, diarrhea.

Watery Diarrhea:
Pathogens induce increased secretion of water into the gastrointestinal tract. Common foodborne causes include *Vibrio cholera*, *Enterotoxigenic E. coli (ETEC), Giardia lamblia, Cryptosporidium parvum, Clostridium perfringens*, and enteric viruses.

Inflammatory Diarrhea:
Pathogens damage and invade the intestinal mucosa leading to an increased inflammatory response, resulting in blood in the stool. Characterized by fever, abdominal pain, and bloody or mucoid diarrhea. Some common causes include *Shigella, Campylobacter, and Enterohemorrhagic E. coli (EHEC).*

S. aureus and B. cereus multiply when food is left out at room temperature, producing preformed toxins. Both toxins predominantly cause nausea and vomiting. *S. aureus* can predominantly be found in dairy products, produce, eggs, meats, and salads. The *Staph* enterotoxin is classified as superantigen that is both heat- and acid-resistant. The toxin causes nausea, vomiting, and abdominal cramps, usually within 1-6 hours following ingestion. *B. cereus* can be found in starchy foods like rice. The *B. cereus* enterotoxin causes nausea and vomiting within 1-6 hours of ingestion and diarrhea within 6-15 hours of ingestion.

Most of the other causes of foodborne illnesses will exhibit a combination of the following symptoms: Nausea, vomiting, diarrhea, and abdominal discomfort. Consider the key symptoms the patient is exhibiting, any food ingested, and timing of symptoms following ingestion of the suspected contaminated food. Differentiating between watery and inflammatory diarrhea may also help narrow the diagnosis.

Treatment

Foodborne illnesses are usually self-limiting. Supportive therapy is the mainstay treatment. Most patients are dehydrated from vomiting and diarrhea and will need IV fluid resuscitation. Antibiotics are generally not warranted, especially if preformed toxins are the root cause. If there is bloody diarrhea, the Infectious Disease Society of America recommends empiric ciprofloxacin or azithromycin only in adults with documented fever and suspected *Shigella* infection, adults with fever and history of recent international travel, and immunocompromised adults with severe illness. Empiric treatment for children meeting above criteria or infants <3 months old should be a third-generation cephalosporin or azithromycin.

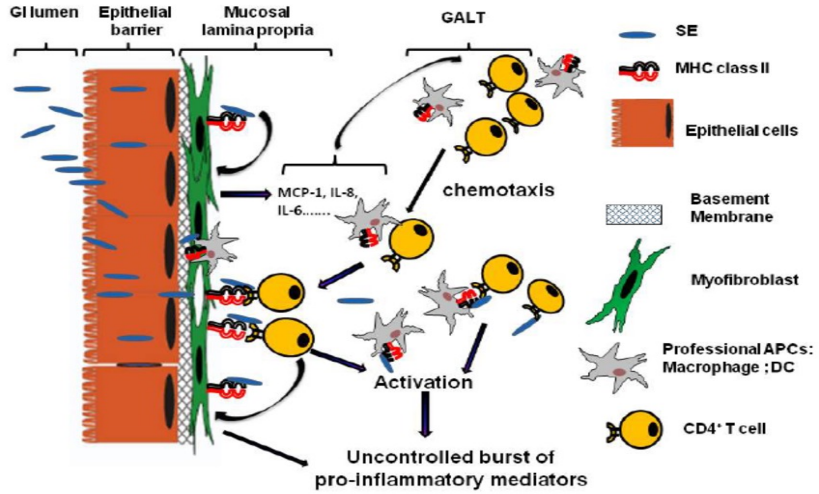

Figure 2. From Pinchuk, Irina V et al. "Staphylococcal enterotoxins." Toxins vol. 2,8 (2010): 2177-97. doi:10.3390/toxins2082177.

Take Home Points

- **Attempt to identify the pathogen by patient symptoms, including watery diarrhea and inflammatory diarrhea (if present), and the estimated onset of symptoms following ingestion of the suspected contaminated food.**
- **If onset is within a few hours, the most likely causative pathogen are preformed enterotoxins from either *S. aureus* or *B. cereus*.**
- **The most common complication of foodborne illness is dehydration. Fluids and supportive care are the first steps in supportive treatment.**
- **The vomiting and diarrhea from foodborne illness are mostly self-limiting - antibiotics are typically not needed.**

About the Author

This month's case was written by Harilaos (Harry) Tsarbopoulos. Harry is a 4th year medical student from AUC. He did his emergency medicine rotation at BHMC in January 2022. His interest currently lies between Internal Medicine and Emergency Medicine.

References

1. Pinchuk, Irina V et al. Staphylococcal enterotoxins. Toxins. Vol. 2,8 (2010): 2177-97. doi:10.3390/toxins2082177

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