CLINICAL VIGNETTE

Perils of Surfing: A Case of Vascular Trauma and Infectious Diarrhea

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Case Presentation

A 40-year-old male presented to his primary care physician following hospitalization for vascular trauma. He surfs multiple times a week and wiped out by a large wave, with the fin of the surfboard lacerated his right thigh. He was able to make it out of the water onto the beach, where a lifeguard found him profusely bleeding, tied a tourniquet around his thigh, and called 911. At the hospital, he was found to have ruptured his right femoral artery and vein and underwent an emergent bypass surgery with graft. The procedure went well. He was cleared by his vascular surgeon several months later to resume surfing.

Eighteen months later, the patient returned complaining of several weeks of crampy abdominal pain and watery diarrhea. He denied any recent travel, sick contacts, or recent antibiotics. Upon further questioning, he revealed he had continued to surf on days when water pollution warnings were in effect. Stool studies were ordered. Ova and parasites smear was positive for *Dientamoeba fragilis* and *Blastocystis hominis*.

Infectious Disease was consulted, and the patient was prescribed metronidazole 750 mg three times daily for 10 days and iodoquinol 650 mg three times daily for 20 days. The patient was not able to obtain iodoquinol and remained symptomatic following completion of metronidazole. Discussion with the pharmacy revealed iodoquinol was becoming less available in the United States. In lieu of iodoquinol, a 10 day course of tetracycline and paromomycin was prescribed. On follow up visit, the patient's symptoms had completely resolved. Repeat stool studies confirmed eradication.

Discussion

Surfing, popular in Southern California, is not without risks and is associated with various injuries and illnesses including lacerations, contusions, and sprains, envenomation from marine mammals; upper respiratory ailments including sore throat, cough, conjunctivitis, sinusitis, and otologic issues; skin and soft tissue infections; and gastrointestinal illness. Our patient suffered both an acute trauma and diarrheal illness related to surfing.

Gastroenteritis in beachgoers may be caused by the inadvertent ingestion of water contaminated with sewage, polluted storm water runoff, and animal waste. Common pathogens causing water-borne gastrointestinal illnesses include Cryptosporidium, Shigella, Vibrio, Salmonella, E coli O157, Norovirus and parasites. The risk of gastrointestinal complaints is 1.3 times higher in ocean bathers compared to non-bathers.[1] Frequency of surfing is associated with a greater risk of symptoms, with those surfing 5-10 times or more a month having three times the odds of having diarrhea compared to those who surf only once or twice a month.[2]

Risk of gastrointestinal illness increases following rainfall, with a two-fold increased risk of diarrhea in those who had surfed regularly during rain events compared to those who did not surf at all or surfed only sometimes during rain events.[2,3] One study examining Southern California beaches, found increases in bacterial concentration in ocean water samples during storms with greater than 6mm rainfall compared to dry conditions or storms with less than 2.5 mm rainfall.[4] Bacterial concentrations remained elevated for up to 5 days after a storm, but fell below state water quality recommendations within 3 days.[4] Unsurprisingly, water contamination from storm drain runoff is associated with an increased risk of illness.[3,5]

In this case, our patient surfed regularly despite rain advisories and presented with several weeks of watery diarrhea and abdominal pain. *Dientamoeba fragilis* and *Blastocystis hominis*, anaerobic intestinal protozoan parasites isolated from his stools, were presumed to be the cause of his symptoms. Their clinical significance remains controversial, as these organisms are found in the gastrointestinal tracts of asymptomatic individuals and therefore have been considered commensal parasites rather than true pathogens. As symptoms are often self-limiting, the necessity of treatment is unclear. However, given that our patient's symptoms had persisted for several weeks, treatment was initiated and resulted in the resolution of symptoms.

Both *Dientamoeba fragilis* and *Blastocystis* spp are thought to be transmitted through a fecal-oral route. Symptoms can include abdominal pain, diarrhea, and bloating. The diagnosis of both is made by the detection of trophozoites in fixed and stained stool samples or by polymerase chain reaction.

The most common treatment of *D. fragilis* consists of metronidazole 500-750 mg three times a day for 10 days. Paromomycin 25 to 35 mg/kg per day orally in three divided doses for 7 days, iodoquinol 650 mg three times a day for 20 days, or tetracycline 500 mg four times daily for 10 days have also been used. However, the availability of iodiquinol in the United States is

limited, and tetracycline is not recommended by the Centers for Disease Control as a treatment option for *D. Fragilis.* The literature on the optimal treatment for *D. fragilis* is conflicting. A study examining in-vitro susceptibility testing of *D. fragilis* to various antimicrobial agents showed 5-nitroimidazole derivatives such as metronidazole to be the most effective.[6] Another study reported, treatment with paromomycin, iodoquinol or both, resulted in much higher eradication rates than with metronidazole.[7]

Blastocystis spp, in the presence of persistent gastrointestinal symptoms where no other causative agent is identified, may also be treated with metronidazole 750 mg three times daily for 5-10 days or with tinadazole 2 g once. Despite its less frequent use, one study reported, paromomycin had greater eradication rates of *Blastocystis* compared to metronidazole (77% for paromomycin vs 38% for metronidazole).[8] Trimethoprim-sulfamethoxazole may also be used.

Our patient remained symptomatic despite a 10 day course of metronidazole but experienced resolution of his symptoms following paromomycin and tetracycline, further suggesting that paromomycin may be superior to metronidazole for these infections.

Conclusion

Many county and state health departments caution swimmers to avoid the ocean, especially areas near storm drains, for at least 72 hours following significant rainfall due to increased risk of illness. In addition, we recommend that all surfers and ocean swimmers check their local or state health department websites for the latest beach water quality testing results and beach health advisories prior to entering the water.

Although the true pathogenicity of *D. fragilis* and *Blastocystis* spp remains unclear, when these parasites are identified, treatment is reasonable in the setting of unexplained and persistent gastrointestinal symptoms. Metronidazole is often considered the treatment of choice, however, paromomycin may be more effective and should be used in cases of metronidazole treatment failure.

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