Travel Illness Outbreak Investigation and Treatment among Interprofessional Health Team Members in Guatemala.

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Abstract

Purpose**:** Americans travel each year and acquire illnesses. Gastrointestinal illness is a common self-reported illness and has many associated risk factors. Students from a medical school in Virginia traveled to Guatemala to provide medical care. Overall, 1,250 patients were seen by the student doctors. An outbreak investigation was initiated when members of the medical team began experiencing illness. Methods**:** Food and water safety was inspected and inquiries were made about the health of other travelers staying at the same host. Furthermore, a voluntary brief survey was completed after returning to the United States. The index patient had seen a patient in the clinic with similar symptoms. An incubation period of 24-36 hours was established. Results**:** After an adequate kitchen inspection including both food and water distribution, it was determined the illness was being spread from person to person. The survey was administered to 93 travelers and 69 completed the survey. Symptoms were reported by 74% of survey respondents. There was no correlation to consumption of food and water. Conclusions**:** Prevention measures such as hand hygiene practices should be emphasized to prevent spread of the illness among medical travelers. Limitations include recall bias.

Purpose

The primary purpose of this research was to determine the cause of illness among the medical travelers and to determine best methods for future prevention. Disseminating results of the outbreak investigation is intended to provide information for the purpose of preventing illness in other traveling groups.

Illness while traveling is a significant public health problem. Millions of Americans travel each year, and many illnesses are acquired and self-reported by the travelers. Gastrointestinal illness is among the most commonly reported by travelers to Latin America (Flores-Figueroa, 2011; Leung 2018). A study by Flores-Figueroa et al. indicates that the majority of these illnesses are acquired acute unspecified diarrhea, followed by Giardia infection and acute bacterial diarrhea (Flores-Figueroa, 2011).

Many risk factors can be associated with gastrointestinal illness while traveling. These include dietary behaviors such as drinking tap water and eating food prepared in unhygienic conditions (Herwaldt 2018). Fecal-oral route transmissions are also common (Koo, 2010).

Research also indicates which pathogens are responsible for travel illnesses. The most common illness found among travelers is caused by enteroaggregative *Escherichia coli* (EAEC) and is commonly called travelers' diarrhea. Although the cause of forty percent of the published cases have not been determined, it is believed to have been originated from "undetected bacterial and nonbacterial enteropathogens" (Koo, 2010). Studies have also shown that noroviruses are another common cause of traveler's diarrhea. In a study of travelers to India, Mexico and Guatemala, "E.coli was seen in 52.9% of travelers where as NoVs were in 10.2% of travelers" (Koo, 2010; LaRocque, 2018).

Many healthcare providers and students who travel abroad are in direct contact with the patients at the clinics. In June 2017, 93 people consisting of physicians, medical students, nursing students and public health professionals embarked on a seven-day journey to serve in an international medical outreach trip to Guatemala from a Virginia university. The goal of this trip was to provide quality in both care to the underserved population and education to the students. There was opportunity for mentoring, both faculty to student and peer to peer, as students worked in teams taking care of patients. The medical team consisted of: four faculty physicians, six community physicians, sixty-four

medical students, three nurses, two of which were faculty, four master of nursing candidates, eight bachelor of nursing candidates, and two public health professionals (93 total). In addition, 35 community members traveled with the medical team, but had separate projects while in country. They did, however, have the same accommodations and meals. The age range was 12-71 years old with most students being between 20-35 years of age.

Student doctors had the opportunity to provide osteopathic medical care by examining, treating, and educating their patients. Specialties included pediatric medicine, general adult medicine and vision care; overall, 1,250 patients were seen consisting of men, women and children. A Christian non-profit organization supported this event by providing accommodations, meals and transportation to assist the students and faculty. The same accommodations were provided to the 35 community travelers. Prior to the trip, all travelers were advised to obtain the vaccines recommended by the Centers for Disease Control and Prevention for travelers to Guatemala. Further, hand hygiene and protective practices such as use of gloves in patient care were emphasized in training.

Methods

Members of the medical team began experiencing illness on the second day of the trip. Due to the symptoms among students, staff, and faculty, an outbreak investigation was initiated. While still in Guatemala, faculty and staff questioned people with symptoms about risk factors, onset of symptoms, severity, and followed with treatment and recovery tracking. Further, food and water safety was inspected throughout the week to ensure that this was not the source of the outbreak. Other groups staying at the same host organization were interviewed to identify illness. After returning to the United States, a brief survey was voluntarily completed by travelers.

Results

The first symptoms occurred on Monday and were reported by one traveler with vomiting and diarrhea, which improved after a few hours. This case reported having brushed their teeth with unfiltered water. No other symptoms were reported until Tuesday when a traveler became very ill with vomiting, diarrhea, and fever. By Wednesday morning, six people were severely ill, unable to eat or drink, febrile, and experiencing profuse diarrhea. Others had less severe symptoms. The number of people with symptoms increased rapidly throughout the trip. The index patient who became ill on Tuesday had seen a patient in clinic on Monday with similar symptoms.

Other traveling groups staying at the host organization were questioned and only one case of illness was identified outside of the medical group (including community members). One volunteer with another group shadowed a physician in clinics with the medical group on Thursday and became ill with the same symptoms by Saturday morning. This helped to establish an approximate 24-36 hour incubation period.

Observations during clinic on Thursday included that students were not practicing hand washing before and after each patient and were not drinking adequate amounts of filtered water. Because of these findings, the established incubation period, and an adequate kitchen inspection, it was determined that the illness was likely being spread from person to person within the group and had probably been acquired initially from another sick person (likely a patient).

Because the traveling group was medical, several licensed physicians provided medical care to the ill members. One patient was treated with ciprofloxacin on Wednesday, and was observed to improve faster than the others. Because of this observation and the severity of

symptoms, ill travelers were subsequently treated with Cipro as well. Because those treated with Cipro recovered faster, a bacterial infectious agent was likely the cause.

The survey administered after returning to the U.S. was voluntarily and confidentially completed online by 69 of the 93 medical travelers. The results concluded that a total of 49 of the respondents (74%) reported symptoms either during or after the trip (or both). Those who became ill were all working together in the clinic and spending day and night hours in the group. There was no correlation to reported consumption of food or water. Despite the outbreak, only one traveler reported that they would not travel with the group again.

Conclusions

Due to the marked difference in illness incidence between the medical team and community travelers, investigating the outbreak was important. Food and water safety inspections and lack of correlation of symptoms to food or water consumption supported person-to-person transmission. The lack of illness in the public health professionals and in the 35 community travelers was likely due to them being involved in activities outside clinic and spending less time with the medical group. Observed poor hand hygiene practices likely contributed to the rapid spread. Good hand hygiene is the primary prevention method for communicable disease and should be emphasized on future trips and among traveling groups in general.

Limitations of the study include risk factors not addressed in the survey. For example, hand hygiene practices in those who had symptoms versus those who did not may have been helpful. However, self-report may not have been consistent with observed practices.

Further, preventative measures such as use of probiotics were not addressed and may be useful data for future investigations. A survey was developed for future use that inquires about more risk factors. Other limitations were those associated with self-report such as recall bias.

References

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