

# SHIGELLOSIS OUTBREAK AND ITS EFFECTS ON SUBJECTS WITH PRE-EXISTING MEDICAL CONDITIONS

Since January 2008 Laredo, Texas experienced a 5-fold rise in cases of *Shigella* bacterial infections. With more than 200 cases reported and confirmed, the City of Laredo Health Department officials needed to control this outbreak. Individuals with underlying medical conditions such as diabetes were of great concern. It was believed that the cause of the bacterial transmission was due to the lack of good hygiene in young children.

As early as July 2008, 220 cases of Shigellosis were confirmed, compared to 25 total cases in 2007. To study the effects of community-wide Shigellosis risks on persons with diabetes, I randomized the case population and selected 50 cases to serve as one study group (N2) and 50 individuals (N3) from the City of Laredo Buena Vida Health group to serve as a control group without a Shigellosis infection. This risk analysis was done by administering an assessment survey tool, which included questions on an individual's history with having a *Shigella* bacterial infection, and if they had ever been diagnosed with diabetes.

Student Researcher: Sergio Alessandro Luna, Martin High School  
Mentors: Waldo A. Lopez, MPH, RS; Monica Gonzalez, MS, MS,  
City of Laredo Health Department, Laredo, Texas

## INTRODUCTION

Shigellosis is a bacterial infection caused by *S. boydii*, *S. dysenteriae*, *S. flexneri*, and *S. sonnei*, also known as bacillary dysentery. Common forms of transmission are due to inadequate hygiene, food-borne infectious agents, and unsanitary recreational/living conditions. Symptoms exhibited by an individual with the bacterial infection include diarrhea which may contain blood, mucus, or pus, abdominal pains, vomiting, and high fever. Diarrhea is caused when the bacterial infection invades and penetrates the intestines, causing a break down of the epithelium and inflating the lamina propria. The results of this are a degeneration of tissue and inflammation tears (ulcerations) along the mucosa membrane, resulting in blood leakage into the intestines along with the production of mucus in the intestines. Therefore, individuals with Shigellosis dysentery's colon absorb excess water, resulting in bloody or mucoid diarrhea.

The infection lasts between 4–10 days, and is treated by replacing fluids and salts lost because of the diarrhea. Antibiotics are typically administered to individuals who are very young, elderly, or immunocompromised, and to those who are at high risk of spreading the infection to other people. This infection for the most part is not life-threatening, nor is it a chronic illness, but it does cause discomfort, and may lead to serious complications throughout its course of infection.

In a community where a large portion of the population is diagnosed with diabetes, an infection such as Shigellosis can be of concern because

of immunodeficiency associated with diabetes.

## METHODS/MATERIALS

In order to make an inference as to what the source of this outbreak is, I analyzed the City of Laredo Health Department's Epidemiology<sup>1</sup> division's 2008 Shigellosis database. From individual case breakdowns, to age prevalence percentages, this database offered information as to what the cause of this outbreak could be.

For this study, a risk assessment questionnaire tool was developed to acquire information as to how Shigellosis affected individuals with diabetes. It asked patients if they experienced any complications with a Shigellosis infection, due to diabetes with a Shigellosis infection. The questionnaire also asked about prevention knowledge and if others in their family were infected with Shigellosis.

## RESULTS

In response to question 1, 56% of the N2 population said no one else in their immediate family was diagnosed with a *Shigella* bacterial infection, and 44% said there were others in their family who were diagnosed. In the N3 population, 98% said they no one in their immediate family was diagnosed with a *Shigella* bacterial infection, and 2% said they had a family member diagnosed with the infection. In response to the 2nd question, all participants of both study groups said they were knew how to prevent a *Shigella* bacterial infection. 100% of the N2 population said they had never been

diagnosed with diabetes and 24% of the N3 population said they had been diagnosed with diabetes, while 76% said they had not been diagnosed.

## DISCUSSION

Study results supported the fact that the increase prevalence of the infection was due to the lack of hygiene control among young children. Infections and illnesses are spread via contagion and, when dealing with an infectious bacterium that is highly contagious, its

probability of spreading is considerably high.

### Recommendation

Education is always the key to preventing the spread of infectious diseases. When persons being infected are not as knowledgeable as others to know "*what to do*," then intervention is the next course of action. Aside from monitoring one's children's hygienic status, one must enforce routine hygiene practices. Stricter hand-washing techniques (such as, being more thorough with the process of washing your

hands, and instead of just washing your hands with only water, use antibacterial soap).

### Recommendation

Have all employees (not limited to education establishments) to become more aware of the sanitary conditions of their environment. Have the public/school restrooms adequately cleaned using Clorox and other disinfecting chemicals. Overall cleansing is a key course toward diminishing the spread of infectious diseases.