

## **Mentored Professional Enrichment Experience**

### **Applicant:**

### **Name of Project/Experience:**

Longitudinal assessment of treatment efficacy for Travelers' Diarrhea

### **Location where Project/Experience will take place:**

Southern Illinois University School of Medicine, Springfield IL.

### **Mentor Name and Contact Information:**

Dr. Janak Koirala

Department of Medicine, Division of Infectious Diseases, Memorial Medical Center Building (701 N. First Street), Room A-486, Springfield

Laboratory Location: Room 2522, SCLF, 801 N. Rutledge, Springfield

217-545-0181

[jkoirala@siumed.edu](mailto:jkoirala@siumed.edu)

## **RATIONALE**

Travelers' diarrhea is a condition where a person experiences three or more loose stools in a 24-hour period usually during or soon after a period of travel. The condition may be accompanied by symptoms of nausea, vomiting, abdominal pain, fever, urgency to defecate, and bloody stools. This condition affects over 50% of travelers, a number that is growing as transportation becomes more affordable and exotic locations become more popular. Pathogens of the intestine are typically the cause of the condition. However, the predominant pathogen causing traveler's diarrhea may vary between different 'at risk' locations. While usually not life threatening, the occurrence of traveler's diarrhea may cause prolonged confinement to bed, decreased effectiveness of other drugs, such as birth control and anti-clotting medications, and may dispose a person to diseases such as irritable bowel syndrome or reactive arthritis. In the social sphere, the condition may interfere with travel or business plans, profits of the travel industry, and the effectiveness of military combat.

The root cause of traveler's diarrhea is poor hygiene and insufficient public health systems. Because corrections for these problems require a long-term commitment and planning, travelers are advised to avoid risky vacation locations, foods, restaurants and accommodations. Depending on the sources available at the traveler's destination and the traveler's schedule, avoiding all risk factors may be difficult. Therefore, travelers who seek advice before traveling are given self-administered 3-day courses of antimicrobials. Popular choices of treatment include fluoroquinolones, rifaximin, and azithromycin. These medications have been shown to decrease the duration of traveler's diarrhea.

Alternatives to antimicrobials are forms of prophylaxis such as bismuth salicylate, which has been shown to decrease the number of loose stools. However, this treatment usually will not be prescribed unless the patient directly asks for it.

Treatments of traveler's diarrhea focus on preventing dehydration and decreasing the duration of symptoms associated with the condition. Efficacy of medications varies depending on a location's predominant pathogen and the patient's age and health status. Numerous studies on the efficacy of certain drugs against specific pathogens leading to traveler's diarrhea have been conducted. For example, Glandt et. al and Infante et. al, conducted studies of the efficacy of ciprofloxacin and rifaximin therapy, respectively, on traveler's diarrhea caused by *Escherichia coli*.

As medication becomes widely used for certain areas, the question of drug resistance becomes important. In Thailand, Kuschner et. al, showed that azithromycin was as effective as ciprofloxacin against *Campylobacter enteritis* and could be useful in areas that are affected by ciprofloxacin resistance. Similarly, in a project by Dr. Janak Koirala, a significant decrease in the efficacy of self-treatment antimicrobials for traveler's diarrhea was found, which may indicate an increase in drug resistance.

This project will be the third phase in a longitudinal study overseen by Dr. Koirala, testing the efficacy of medications and treatments for travelers' diarrhea. The first objective is to compare the efficacy of various methods of self-treatment for traveler's diarrhea including medications that have recently become more popular such as rifaximin. The second objective is to evaluate if the efficacy of self-treatment with antibiotics has changed over time as result of increased microbial drug resistance.

## **GOALS**

The primary goal of this study is to identify trends for the efficacy of various self-administered treatments for traveler's diarrhea. Along with this primary goal, I hope to track longitudinal trends that may indicate alterations in the level of microbial resistance to antimicrobial treatments.

My short-term educational goals include becoming familiar with different infectious diseases and the research done on them focusing primarily on the pathogens associated with traveler's diarrhea. In addition, I will need to learn how to do different statistical analyses such as Chi square and Fischer exact tests in order to evaluate the data gathered in this study.

My personal goal for this project is to get some experience with clinical research and the field of infectious disease. I am interested in infectious disease as a medical specialty to pursue professionally. Furthermore, I would like to use the experience to gauge interest in Public Health arena. Another long-term goal would be to use this experience to determine my interest in pursuing a MPH or a PhD to supplement my medical professional goals.

## **METHODS**

This study will be a retrospective case control study. The travelers who have visited SIU School of Medicine's international travel clinic over the past two years will

be surveyed by sending questionnaires. They will be questioned on the travel destination, if they experienced travelers' diarrhea, if they self-treated with medications, and their results with those specific medications. General information will be gathered as well about the participants in order to correlate the severity and duration of their illness with specific populations and vacation locations and activities. A SPSS software program will be used to compile the data and analyze the use of medications and treatments by the statistical significance of their effectiveness. The data will be used to establish trends in medicinal effectiveness and declines that may be due to increases drug resistance.

## ANALYSIS

To meet the criteria for high efficacy, a drug must show that it decreased the duration of diarrhea and its accompanying symptoms as well as decrease the severity of the condition by decreasing the number of loose stools and fewer symptoms. For statistical analysis, Fisher Exact test and Chi square tests will be done using SPSS software. I hope to see statistical significant trends indicating that specific medications are more effective than others depending on the prominent pathogens of different regions. Furthermore, I would like to confirm the decline in antimicrobial effectiveness seen in the previous phase and show that the efficacy has improved or further decreased. Declines in other drugs' effectiveness will also be correlated with the rises in drug resistance.

## REFERENCES

Al-Abri, Dr. Seif., et. al. (June 2005) Travelers' Diarrhoea. The Lancet Infectious Diseases. Vol. 5, Issue 6

Glandt, M. et. al (August 1999) Enter aggregative Escherichia coli a cause of traveler's diarrhea: clinical response to ciprofloxacin Clinical Infectious Disease. 335-8

Infante, RM et. al (February 2004) Enteroaggregative Escherichia coli diarrhea in travelers: response to rifaximin therapy. Clinical Gastroenterology Hepatology.135-8

Kuschner, R.A. et al. (September 1995) Use of azithromycin for the treatment of Campylobacter enteritis in travelers to Thailand, and area where ciprofloxacin resistance is prevalent. Clinical Infectious Disease. 536-41

Steffen, Dr. Robert, et al. (2003) Therapy of Traveler's Diarrhea with Rifaximin on Various Continents. The American Journal of Gastroenterology. Vol. 98, No. 5

## SUPPORT

1. Do you request support funds?  Yes  No

2. Would you be able to participate if a scholarship is not available?  Yes  No