Typhoid Fever

Traveler Summary

Key Points

- Typhoid fever and paratyphoid fever are bacterial infections occurring worldwide, acquired through the consumption of fecally contaminated food or water, mainly in settings with poor hygiene.
- Risk is intermediate for travelers but highest for those visiting friends and relatives and those with travel outside prearranged, fixed itineraries going to remote areas of affected countries (especially in South and Southeast Asia).
- Symptoms include prolonged, gradually increasing fever, fatigue, headache, muscle ache, loss of appetite, and diarrhea or constipation.
- Consequences of untreated infection include intestinal perforation, gastrointestinal (GI) bleeding, or death.
- Prevention includes observing food and beverage precautions and hand hygiene (frequent, thorough handwashing), regardless of vaccination status.
- Injectable typhoid vaccine requires a single dose. Oral typhoid vaccine is given in 4 doses (1 dose every other day).
- Injectable vaccine side effects are most commonly injection-site reactions. Oral vaccine side effects are most commonly nausea, abdominal pain and cramps, vomiting, fever, headache, and rash or hives.
- Revaccination is recommended for conditions of continued exposure after 2 to 5 years depending on the vaccine previously used.

Introduction

Typhoid fever and paratyphoid fever are potentially serious bacterial infections known as enteric (intestinal) fevers, which occur worldwide and are acquired mainly through the consumption of fecally contaminated food or water. Risk is highest in low- and middle-income countries, especially in South Asia. Untreated typhoid fever is fatal in up to 20% of cases; however, with early and appropriate antibiotic treatment, the death rate falls to less than 1%.

Risk Areas

Typhoid fever mainly occurs in countries with warm climates and less developed sanitary facilities for sewage disposal and water treatment, especially in Africa, South Asia (mainly Bangladesh, India, and Pakistan), and Southeast Asia. Typhoid and paratyphoid fevers are uncommon in the US, with most cases occurring among international travelers, the majority of whom had traveled to South Asia. However, some cases have occurred in persons with no history of international travel.

Transmission

Typhoid and paratyphoid fevers are mainly transmitted through the consumption of fecally contaminated food and water. Rarely, transmission may occur through sexual contact, especially among men who have sex with men. Persons with acute typhoid fever or recovering from illness and persons with chronic illness are the main sources of infection in the community.

Risk Factors

Risk is intermediate for travelers going to affected areas (regardless of the visit duration) and is related to overall food hygiene anywhere in the developing world. Risk is highest for those visiting friends and relatives and/or going to remote areas of countries where the disease normally exists. However, in any country in the world, even the most hygienic restaurant could be risky because of a food handler who is a healthy, symptom-free typhoid carrier.

The risk of becoming ill following infection varies with the number of bacterial organisms ingested and the level of gastric (stomach) acid secretion. Stomach acid is the body's first line of defense against the bacteria, and reduced acid from taking medicines (such as antacids) increases the risk of infection.

Symptoms

Symptoms most commonly appear approximately 21 days (range: 6-30 days) following exposure and include prolonged, gradually increasing high fever (by the third or fourth day of illness), fatigue, headache, muscle aches, loss of appetite, and a

rash appearing on the trunk; diarrhea or constipation may occur. Fever is usually lowest in the morning and peaks in the late afternoon or evening. Vomiting and diarrhea may occur more commonly in children than in adults. Typhoid fever and paratyphoid fever have the same symptoms, but typhoid fever may be more dangerous. Symptoms of typhoid fever can be confused with malaria.

Consequences of Infection

Untreated typhoid or paratyphoid fever can lead to intestinal perforation, GI bleeding, or death. Death occurs in less than 1% of symptomatic cases if treated early but may increase to 12% to 30% in untreated persons. Relapse, reinfection, or chronic carriage can also occur, with up to 10% of persons relapsing 1 to 3 weeks after recovery.

Need for Medical Assistance

Travelers who develop a high persistent fever, abdominal discomfort, and general weakness during travel or upon return from endemic areas should seek urgent medical assistance.

Prevention

Nonvaccine

Travelers should observe food and beverage precautions and hand hygiene (frequent, thorough handwashing), regardless of vaccination status. See ***Food and Beverage Precautions***.

Vaccine

Two moderately effective vaccines (injectable or oral) are approved in the US for typhoid fever but not for paratyphoid fever. Protection is longer with the oral vaccine (5 years). Several typhoid fever vaccines are available outside the US.

Vaccination is not 100% effective, hence the need for food and beverage precautions.

For travel to risk countries, vaccination is recommended for travelers:

- With long stays
- With adventurous eating habits
- Who travel outside prearranged, fixed itineraries (including common tourist packages), especially in rural areas
- Who visit relatives or friends (who may be less likely to eat safe foods)
- Going to smaller cities, villages, and rural areas that are off the usual tourist itineraries, where food and beverage choices may be more limited
- Who have previously had typhoid disease (history of typhoid disease does not confer long-term protection)

Side Effects

The most common side effects of the injectable vaccine include redness and tenderness at the injection site. Occasionally, fever, headache, influenza-like episodes, abdominal pain, vomiting, and diarrhea occur.

The most common side effects of the oral vaccine include nausea, abdominal pain and cramps, vomiting, fever, headache, and rash or hives.

Persons with underlying medical conditions or who have concerns about the vaccine should speak to their health care provider before vaccine administration.

Timing

The injectable vaccine is given as follows:

- Travelers 2 years and older: 1 dose
- Vaccination should be completed at least 2 weeks before potential exposure.

The oral vaccine is given as follows:

- Travelers 6 years and older: 4 oral doses; 1 capsule taken every other day (days 0, 2, 4, and 6) with cool or lukewarm water 1 hour before or 2 hours after a meal.

- Capsules must be kept refrigerated at 2-8°C (36-46°F) and should not be exposed to direct sunlight. Vaccine potency is dependent on proper refrigerated storage; some small temperature deviations may be acceptable. Contact the prescribing provider if the vaccine has not been stored properly.
- Vaccination should be completed at least 1 week before potential exposure.

Revaccination is recommended for conditions of continued exposure and can be done with either vaccine, with the interval depending on the last vaccine used (2 years if the injectable vaccine was previously used, and 5 years if the oral vaccine was previously used).

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