Travel Related Infectious Disease

Robert E. Wheeler, MD, FACEP

Hosted by Paul Webber
paul@webbertraining.com

www.webbertraining.com

Traveler's Diarrhea - Causes

- Typically acquired via ingestion of fecally contaminated food and/or water
- Undercooked meat & seafood
- Raw fruits & vegetables
- Water, ice, dairy products
- Inadequate personal hygiene practices

Traveler's Diarrhea - Risk Factors

- Destination
- Duration of visit
- Complacency with prevention measures
- Street vendors > restaurants > home cooked meals
- Young travelers > old

Foreign Travel Risk Factors

- Destination(s)
- Duration of trip
- Activities
- Health status
- Vaccinations
- Protection against insect bites
- Malaria prophylaxis

Traveler's Diarrhea

- Most common travel related illness
- Loose/watery stools, abdominal cramps, bloating, nausea, urgency, fever
- Sudden onset
- Duration usually less than 1 week
- May become chronic

Risks of Foreign Travel

- More than 60 million people from the United States and 17 million from Canada travel internationally each year
- 25% of these travelers go to developing countries
  - Tropical and infectious disease
  - Dangerous transportation
  - Hazardous activities
  - Limited health care resources
Travel Related Infectious Disease
Dr. Robert Wheeler
A Webber Training Teleclass

TD Biological Agents
- Enterotoxigenic Escherichia coli (ETEC)
  - Most common cause of TD worldwide
- Salmonella
- Shigella
- Campylobactor
- Vibrio
- Listeria

Travelers’ Diarrhea - Prevention
- “Boil it, cook it, peel it or forget it!”
- Proper hand hygiene
- Safe fluids
  - Bottled water, juice, beer, soda
  - Hot coffee and tea
- Bismuth subsalicylate (Pepto-Bismol)
  - 60 cc or 2 tablets qid
- Prophylactic antibiotics not recommended

Travelers’ Diarrhea - Treatment
- Clear (safe) PO fluids
- Bismuth subsalicylate (Pepto-Bismol)
  - 30 cc or 1 tablet PO q 1 hour PRN
  - Maximum of 8 doses in 24 hours
- Loperamide (Imodium)
  - 4 mg PO, then 2 mg after each watery stool
  - Maximum of 8 tablets a day
- Atropine/diphenoxylate (Lomotil)
  - Two 0.025/2.5 mg tablets or 10 cc liquid PO qid

Travelers’ Diarrhea - Empiric RX
- Azithromycin 1 gm PO x 1 dose
- Levofoxacin 500 mg PO x 1 dose
- Cefixime 400 mg PO qd for 1-3 days
- Ciprofoxacin 500 mg PO bid for 1-3 days
- Ofloxacin 400 mg PO bid for 1-3 days

Malaria
- 300-500 million cases each year worldwide
- 2-3 million deaths annually
- Caused by the Plasmodium protozoan parasite
- Transmitted by female Anopheles mosquito
**Travel Related Infectious Disease**

**Dr. Robert Wheeler**

**A Webber Training Teleclass**

---

**Malaria Parasite**

- *Plasmodium falciparum*
  - 40-60% of malaria
  - 95% of deaths
  - Chloroquine resistance
- *Plasmodium vivax*
  - 30-40% of cases
- *Plasmodium ovale*
  - West Africa
- *Plasmodium malariae*

**Malaria**

**Symptoms**
- Fever
- Chills
- Sweats
- Headache
- Myalgia
- Malaise

**Complications**
- Anemia
- Hepatomegaly
- Splenomegaly
- Jaundice
- Renal failure
- Coma
- Death

---

**Malaria Diagnosis**

- Clinical signs & symptoms
- Thick & thin blood smears
- Antigen test kits

---

**Malaria Prevention**

- Risk awareness
- Protective clothing
- Mosquito netting
- N,N-diethylmetatoluamide (DEET)
- Permethrin
- Drug prophylaxis
**Malaria Drug Prophylaxis**

- Start 1-2 weeks prior to travel
- Continue for 4 weeks post travel
- Chloroquine (Aralen) 500 mg q week
- Hydroxychloroquine (Plaquenil) 400 mg q week
- Mefloquine (Lariam) 250 mg q week
- Doxycycline 100 mg qd

**Malaria Treatment**

- Chloroquine 1 gm PO, 0.5 gm in 6 hours then 0.5 gm qd x 2 days plus primaquine 30 mg PO qd x 14 days for P. vivax or P. ovale.
- Quinine sulfate 650 mg PO tid plus doxycycline 100 mg PO bid x 7 days
- Pyrimethamine-sulfadoxine (Fansidar) 3 tablets, 75/1500 mg total single dose

**SARS**

- Severe Acute Respiratory Syndrome
- The Emerging Disease of 2003
- Origins in Guangdong Province, China

**SARS-CoV**

- Causative agent for SARS
- Coronavirus
- Inter-species transmission from civets

**SARS Transmission**

- Close person to person contact
- Respiratory droplets
- Contaminated environmental surfaces
- Aerosol
- Inhalation & mucous membrane contact
Travel Related Infectious Disease
Dr. Robert Wheeler
A Webber Training Teleclass

SARS Infection
- Incubation period of 2-10 days
- Fever > 38°C (100.4°F)
- Dry cough
- Dyspnea
- Chills, rigors, headache, myalgia, sore throat, rhinorrhea, diarrhea
- Pneumonia
- Acute Respiratory Distress Syndrome

SARS Surveillance
- Clinical signs & symptoms
- Travel to a suspect or confirmed SARS area within the previous 10 days
- Close contact with a suspect or confirmed SARS case within 10 days

SARS Diagnosis
- Positive surveillance criteria
- Diagnostic lab tests
  - RT-PCR
  - Enzyme immunoassay
  - SARS-CoV culture

SARS Treatment
- Supportive care
- Steroids (?)
- Ribavirin (?)
- Interferon (?)
- Isolation
  - Respiratory
  - Droplet
  - Contact

Lyme Borreliosis
- Lyme Disease
- Caused by Borrelia burgdorferi
- Transmitted via Ixodes species ticks
- Reservoir hosts
  - White-footed mouse
  - White-tailed deer
  - Dusky-footed wood rat
  - Dogs, cats, birds, sheep, cattle, horses

World-wide Distribution of Lyme Disease
Travel Related Infectious Disease
Dr. Robert Wheeler
A Webber Training Teleclass

Lyme Disease in the United States

Lyme Borreliosis - Prevention
- Risk awareness
- Avoidance of tick-prone environments
- Light colored protective clothing
- Daily body surface examination for ticks
- N,N-diethylmetatoluamide (DEET)
- Permethrin

Lyme Borreliosis – Stage 1
- Ixodes bite/feeding
  - Inoculation requires 1-2 days of attachment
  - 7-14 days incubation period
  - Erythema Migrans (Bull’s-Eye Rash)
- Fever, headache, myalgia, arthralgia, fatigue

Lyme Borreliosis – Stage 2
- Early disseminated phase
- Weeks to months after inoculation
- Neurologic manifestations
  - Facial palsy
  - Aseptic meningitis
  - Encephalitis
  - Radiculoneuritis
  - Neuropsychiatric disturbances

Lyme Borreliosis – Stage 2
- Cardiac manifestations
  - Atrioventricular heart block
  - Pericarditis
  - Myocarditis
  - Cardiomyopathy

Lyme Borreliosis – Stage 3
- Late disseminated phase
- Months to years after inoculation
- Progressive arthralgia
- Arthritis
Lyme Borreliosis - Diagnosis

- Clinical signs & symptoms
- Enzyme immunoassay
- Indirect fluorescent antibody
- Western immunoblot

Lyme Borreliosis - Treatment

- Prophylaxis
  - Doxycycline 200 mg PO
- Early RX - Erythema Migrans
  - Doxycycline 100 mg PO bid x 14-21 days
  - Amoxicillin 500 mg PO tid x 14-21 days
  - Cefuroxime 500 mg PO bid x 14-21 days
  - Erythromycin 250 mg PO qid x 14-21 days

- Later RX - Arthritis
  - Doxycycline 100 mg PO bid x 30-60 days
  - Amoxicillin 500 mg PO qid x 30-60 days
  - Ceftriaxone 2 gm IV qd x 14-28 days
  - Penicillin 20-24 mU IV qd x 14-28 days

- Later RX - CNS
  - Ceftriaxone 2 gm IV qd x 14-28 days
  - Penicillin 20-24 mU IV qd x 14-28 days
- Later RX - Carditis
  - Ceftriaxone 2 gm IV qd x 14-28 days
  - Penicillin 20-24 mU IV qd x 14-28 days
  - If only first degree AV block, may consider:
    - Doxycycline 100 mg PO bid x 14-21 days
    - Amoxicillin 500 mg PO tid x 14-21 days

Vaccine Preventable Disease

- Cholera, 2005-1993
- Malaria, 2005-1993

Hosted by Paul Webber  paul@webbertraining.com  www.webbertraining.com
Travel Related Infectious Disease
Dr. Robert Wheeler
A Webber Training Teleclass

Vaccine Preventable Disease

- Cholera

Vaccines Routine Immunizations
- DTP
- MMR
- Polio
- Influenza
- Pneumococcus
- H. influenza b
- Varicella

Vaccines Recommended per destination(s)
- Hepatitis A, B
- Immune globulin
- Meningococcus
- Japanese encephalitis
- Plague
- Rabies
- Tick-borne encephalitis
- Tuberculosis (?)
- Typhoid fever

Vaccines Required per destination(s)
- Yellow fever
- Cholera

Travel Preparation & Disease Prevention
- Destination research
- Disease awareness
- Health status
- Disease prophylaxis
- Medical & travel insurance
- Travel medical kit

Post-travel Illness
- Fever
- Abdominal pain
- Cough
- Weight loss
- Chills
- Fatigue
- Diarrhea
- Rash
- Nausea/vomiting
- Myalgia/arthritis
Travel Related Infectious Disease
Dr. Robert Wheeler
A Webber Training Teleclass

Travel Medicine Resources
- Health Information for International Travel 2003-2004 (The Yellow Book); CDC
- International Travel and Health 2004 WHO
- Textbook of Travel Medicine and Health Herbert L. Dupont, MD and Robert Steffen, MD
- The Travel and Tropical Medicine Manual Elaine Jong, MD and Russell McMullen, MD
- Wilderness Medicine Paul S. Auerbach, MD

Travel Medicine Resources
- Centers for Disease Control www.cdc.gov
- Health Canada www.hc-sc.gc.ca
- International Society of Travel Medicine www.istm.org
- World Health Organization www.who.int

Travel widely…but travel wisely.
ISTM

For additional information:
Robert E. Wheeler, MD, FACEP
Voyager Medical Seminars
9 Corduroy Road
Amherst, NH 03031-2724
603.672.5775 Voice/Fax
vms@adelphia.net
www.vms4csm.com