Travel Medicine for Primary Care Physician

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Educational Need/Practice Gap
Gap = Risk of potential health hazards in developing countries
Need = Refresh the knowledge of immunizations for vaccine-preventable diseases and malaria chemo-prophylaxis

Objectives
Upon completion of this educational activity, you will be able to:
• Assess the traveler’s trip plans and determine potential health hazards
• Discuss with the traveler regarding the anticipated risks and methods for prevention
• Describe appropriate immunizations for vaccine-preventable diseases and medications for prophylaxis, self-treatment or both

Expected Outcome
• Discuss with the traveler regarding the anticipated risks and methods for prevention
• Describe appropriate immunizations for vaccine-preventable diseases and medications for prophylaxis, self-treatment or both

Faculty Disclosure
None
Pre-Travel Consultation - Risk Assessment

- Information about the traveler
  - Age and sex
  - Medical history
  - Medications
  - Allergies
  - Immunization history
  - Special health needs

Pre-Travel Consultation - Risk Assessment

- Information about the trip
  - Destination
  - Departure, length of stay
  - Mode of transport
  - Purpose of the trip, planned activity
  - Quality of accommodation
  - Financial budget, insurance provision
  - Health care stands at destination

A 30 year old college student is planning for 2 weeks of travel to Ghana. What vaccine would you recommend?

A. hepatitis A, hepatitis B, yellow fever, Japanese B encephalitis
B. hepatitis A, yellow fever, meningococcal vaccine, polio
C. Hepatitis A, hepatitis B, typhoid, yellow fever, meningococcal

Visit to Ghana

- Vaccine preventable diseases – Cholera, Hepatitis A, Hepatitis B, Influenza, Meningococcal meningitis, Rabies (for some travelers), Typhoid fever, Yellow fever
- Malaria
- Other diseases: African trypanosomiasis, Dengue, Filarial infections, Schistosomiasis, Traveler’s diarrhea, Tuberculosis, Viral hemorrhagic fever

Traveler’s diarrhea

- 20% to 60% of travelers
- “boil it, cook it, peel it, or forget it,”
- Poor hygiene practice in local restaurants is likely the largest contributor
- A clinical syndrome that can result from a variety of intestinal pathogens
  - Bacteria 80%–90%
  - Virus 5%–8%
  - Protozoa 10%
Traveler’s diarrhea

- 25% of those have to alter their itinerary
- 15% are confined to bed
- 1-3% have persistent GI problems (post infectious irritable bowel syndrome)

Clinical manifestation of Traveler’s Diarrhea

- The sudden onset of mild abdominal cramps and urgent loose stools to severe abdominal pain
- Fever, vomiting, and bloody diarrhea.
- Incubation period
  - Bacterial and viral pathogens: 6–48 hours
  - Protozoal pathogens: 1–2 weeks
    - Exception Cyclospora cayetanensis, which can present quickly in areas of high risk.

Clinical manifestation of Traveler’s Diarrhea (cont.)

- The average duration of untreated traveler’s diarrhea is 4 to 5 days
- Viral diarrhea lasts 2–3 days
- Protozoal diarrhea can persist for weeks to months without treatment
- 12%~46% of patients with traveler’s diarrhea have short-term disability

Factors associated with increased risk of acquiring traveler’s diarrhea

- Adventure travel, visiting friends and relatives – varying exposure to contaminated food and beverages
- Age – possibly more pathogens ingested (crawling infants, larger appetites in adolescents)
- Lack of caution in beverage and food selection – varying exposure to contaminated food and beverages
- Use of proton pump inhibitor therapy – altered killing of enteric pathogens from gastric hydrochloric acid.

Table 2: Estimated Regional Differences in the Biology of Traveler’s Diarrhea

<table>
<thead>
<tr>
<th>Organism</th>
<th>Latin America</th>
<th>Asia</th>
<th>South Asia</th>
<th>South-East Asia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entamoeba histolytica</td>
<td>±5</td>
<td>&lt;5</td>
<td>±5</td>
<td>±5</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>2–13</td>
<td>±15</td>
<td>±15</td>
<td>±15</td>
</tr>
<tr>
<td>Campylobacter</td>
<td>&lt;5</td>
<td>&lt;5</td>
<td>±15</td>
<td>±15</td>
</tr>
<tr>
<td>Salmonella</td>
<td>&lt;5</td>
<td>&lt;5</td>
<td>±15</td>
<td>±15</td>
</tr>
<tr>
<td>Shigella</td>
<td>±5</td>
<td>±5</td>
<td>±15</td>
<td>±5</td>
</tr>
<tr>
<td>Norovirus</td>
<td>15–25</td>
<td>15–25</td>
<td>5–15</td>
<td>±5</td>
</tr>
<tr>
<td>Rotavirus</td>
<td>15–25</td>
<td>±15</td>
<td>±5</td>
<td>±5</td>
</tr>
<tr>
<td>Giardia</td>
<td>&lt;5</td>
<td>&lt;5</td>
<td>±5</td>
<td>±5</td>
</tr>
</tbody>
</table>
Food and Water Precaution

- Good hand hygiene
- Avoid all raw food (undercooked meat, fish, and shellfish), salads, uncooked vegetables, unpasteurized fruit juices, and unpasteurized milk and milk products
- Should eat fully cooked and served hot food
- Use bottled water from an unopened, factory-sealed container

Vaccine

- Required Vaccine
  - Meningococcal vaccine for pilgrims traveling to Mecca during the Hajj
  - Yellow fever vaccine
- Routine vaccine
  - Influenza vaccine, Tdap, MMR
- Recommended vaccine
  - Hepatitis A and B
  - Polio vaccine for travel to endemic countries
  - Meningococcal vaccine

Which of the following vaccine contains egg protein?

A. Hepatitis A vaccine
B. Hepatitis B vaccine
C. Injection typhoid fever vaccine
D. Yellow fever vaccine

Yellow Fever Vaccine

- International regulations
- WHO International Travel and Health
- Specially licensed Yellow Vaccination Centers
- Need to document on appropriate certificate of immunization card
Side Effect of Yellow Fever Vaccine

- Generally mild and include headaches, myalgia (muscle aches), and low-grade fevers.
- Serious events – rare
  - Anaphylaxis (life-threatening allergic reaction)
  - Yellow fever vaccine-associated viscerotropic disease (YEL-AVD)
  - Yellow fever vaccine-associated neurologic disease (YEL-AND)

Yellow fever vaccine

Contraindications (conditions in which vaccine should not be given)

- Allergy to vaccine component
- Age <6 months
- Symptomatic HIV infection or CD4+ T-lymphocytes <200/mm³ (<15% of total in children aged <6 years)
- Thymus disorder associated with abnormal immune function
- Primary immunodeficiencies
- Malignant neoplasms
- Transplantation
- Immunosuppressive and immunomodulatory therapies
Meningitis Belt

MAP 3-11. AREAS WITH FREQUENT EPIDEMICS OF MENINGOCOCCAL MENINGITIS

Meningococcal vaccine

<table>
<thead>
<tr>
<th>Trade name</th>
<th>Type of Vaccine</th>
<th>Meningococcal Serogroups Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bexsero®</td>
<td>Recombinant</td>
<td>B</td>
</tr>
<tr>
<td>Menactra®</td>
<td>Conjugate</td>
<td>A, C, W, Y</td>
</tr>
<tr>
<td>MenHibrix®</td>
<td>Conjugate</td>
<td>C, Y (and Haemophilus influenzae type b [Hib])</td>
</tr>
<tr>
<td>Menomune®</td>
<td>Polysaccharide</td>
<td>A, C, W, Y</td>
</tr>
<tr>
<td>Menveo®</td>
<td>Conjugate</td>
<td>A, C, W, Y</td>
</tr>
<tr>
<td>Trumenba®</td>
<td>Recombinant</td>
<td>B</td>
</tr>
</tbody>
</table>

Meningococcal vaccine (cont.)

- Meningococcal polysaccharide vaccine (MPSV4)
  - Only vaccine available > 55 years
  - Used extensively in mass vaccination programs
  - Usefulness is limited because it does not confer long-lasting immunity
- Meningococcal conjugate vaccine (MCV4)
  - 2 - 55 years
  - T-cell-dependent immune response.
  - A strong anamnestic response at re-exposure

Geographic Distribution of Typhoid Fever

Typhoid Vaccine

Inactivated typhoid vaccine (IM)
- It should be given at least 2 weeks before travel
- A booster dose is needed every 2 years for people who remain at risk.

Live typhoid vaccine (oral)
- Four doses: one capsule every other day for a week (day 1, day 3, day 5, and day 7).
- The last dose - at least 1 week before travel
- A booster dose is needed every 5 years for people who remain at risk.

*For multiple countries, estimates of prevalence of antibody to hepatitis A virus (anti-HAV), a marker of previous HAV infection, are based on limited data and might not reflect current prevalence. In addition, anti-HAV prevalence might vary within countries by subpopulation and locality. As used on this map, the terms “high,” “medium,” and “low” endemicity reflect available evidence of how widespread infection is within each country rather than precise quantitative assessments.
Hepatitis A vaccine

- All susceptible people traveling for any purpose, frequency, or duration to countries with high or intermediate HAV endemicity should be vaccinated
- One dose of a monovalent hepatitis A vaccine protects most healthy people
- Should be administered as soon as travel is considered.
- Hepatitis A immunoglobulin - within 2 weeks of travel
  - in addition to vaccine
  - older adults
  - immunocompromised persons
  - chronic liver disease

Hepatitis B vaccine

- Administered to all unvaccinated people traveling to areas with intermediate to high prevalence of chronic hepatitis
- Ideally, begin ≥6 months before travel
- Optimal protection, is not conferred until after the final vaccine dose is received.
- An alternate, accelerated 4-dose schedule is available for Twinrix; doses can be administered at 0, 7, and 21–30 days, followed by a dose at 12 months.

Travel Health Kit

Medications For
- Chronic condition
- Fever
- Diarrhea
- URI
- Destination related
- Antimotion sickness
- Needle and syringe

Acute Mountain Sickness

- Symptoms are those of an alcohol hangover: headache (cardinal symptom), fatigue, loss of appetite, nausea, and occasionally vomiting.
- Headache onset is usually 2–12 hours after arrival at a higher altitude and often during or after the first night.
- Preverbal children may develop loss of appetite, irritability, and pallor.
- AMS generally resolves with 24–72 hours of acclimatization.

High Altitude Pulmonary Edema

- 1 per 100 climbers at >14,000 ft (4,300 m).
- 1 per 10,000 skiers in Colorado
- Initial symptoms are increased breathlessness with exertion, and eventually increased breathlessness at rest, associated with weakness and cough.
- Oxygen or descent is life-saving.
- HAPE can be more rapidly fatal than HACE.
High Altitude Cerebral Edema

• Lethargy becomes profound, with drowsiness, confusion, and ataxia on tandem gait test.
• A person with HACE requires immediate descent; death from HACE can ensue within 24 hours of developing ataxia if the person fails to descend.

Which of the following is NOT a mosquito borne disease?

A. Chagas disease
B. Yellow fever
C. Dengue
D. Chikungunya
E. Japanese encephalitis

Protection against mosquitos, insects

• Avoid outbreaks
• Be aware of peak exposure times and places
• Wear appropriate clothing
• Check for ticks
• Bed nets
• Repellent use for skin and clothing
  – DEET
  – Picaridin
  – Oil of Lemon eucalyptus
  – IR3535

Box 2-42: Tips for acclimatization

• Ascend gradually, if possible. Avoid going directly from low altitude to more than 9,000 ft (2,750 m) or sleeping altitude in 1 day. Once above 9,000 ft (2,750 m), never sleeping altitude no higher than 1,600 ft (500 m) per day, and plan an extra day for acclimatization over 5,300 ft (1,600 m).
• Consider using acetazolamide to speed acclimatization, if abrupt ascent is unavoidable.
• Avoid alcohol for the first 48 hours.
• Participate in any mild exercise for the first 48 hours.
• Having a high-altitude exposure at more than 9,000 ft (2,750 m) for 2 nights or more, within 30 days before the trip is useful.

Mosquito borne Diseases

• Malaria
• Yellow fever
• Dengue
• Chikungunya
• Rift Valley Fever
• Arboviral meningitis
  – Eastern equine encephalitis
  – Japanese encephalitis
  – La Crosse encephalitis
  – St. Louis encephalitis
  – West Nile virus
  – Western equine encephalitis

Malaria endemic area
Malaria in America

Malarone

Pros
- Last minute travelers
- Daily meds
- Good for short trip
- Well tolerated
- Peds formulation available

Cons
- Pregnant or breastfeeding a child less than 5 kg
- Severe renal impairment
- Tends to be more expensive than some of the other options (especially for trips of long duration)

Chloroquine

Pros
- Weekly
- Good choice for long trips
- Some people are taking hydroxychloroquine; may not need additional medicine
- All trimesters of pregnancy

Cons
- Cannot be used in CQ resistance
- May exacerbate psoriasis
- Not a good choice of last minute travelers

Mefloquine

Pros
- Weekly
- Good choice for long trips
- Can be used in pregnancy

Cons
- In areas with mefloquine resistance
- Certain psychiatric conditions
- Seizure disorder
- Cardiac conduction abnormalities

Doxycycline

Pros
- Daily
- Good for last minute travelers
- ? least expensive
- Already taking for Acnes
- Also can prevent some additional infections (e.g., Rickettsiae and leptospirosis)

Cons
- Pregnant women and children <8 years old
- Relative contraindication
- Women prone to getting vaginal yeast infections
- Persons planning on considerable sun exposure
- Concerned about the potential of getting an upset stomach from doxycycline

Primaquine

Pros
- Most effective for P. vivax
- Good choice for short trip and last minute travelers

Cons
- G6PD deficiency
- Pregnant women
- Women who are breastfeeding unless the infant has also been tested for G6PD deficiency
- Some people are concerned about the potential of getting an upset stomach from primaquine
Japanese Encephalitis

- Transmission
  - Dusk to dawn biting Culex species mosquito in rural Asia
- Risk of infection
  - 1/5,000 to 1 per million travelers per week of stay in endemic country
  - Risk correlates with rural exposure in endemic areas but may occur in short beach vacations.

Japanese Encephalitis Vaccine

- Inactivated cell culture derived vaccine (0 and 28 days)
- Indications: travels to at risk countries in Asia, especially long-stay travelers and those visiting rural farming areas at night.

Travax Provider Health Report

Itinerary
Round trip: United States — Shara — United States

Health Concerns Summary
The following may pose a risk or require preventive measures based on this itinerary. See the report sections below for details.

- Vector-borne Diseases: dengue, chikungunya, yellow fever
- Malaria
- Other Diseases: hepatitis A, hepatitis B, influenza, meningococcal meningitis, typhoid fever

Any Question?