Ensuring Patient Safety for International Travel: Vaccines, Pharmaceuticals, and More

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Goals & objectives

• By the end of the discussion, we will be able to
  – Identify reliable resources in selecting travel health information
  – Identify 5 essential travel vaccines for Rwanda and describe their safe, effective administration
  – Discuss malaria, its mode of transmission, pathophysiology, corresponding preventative measures,
  – Explain the prevention and treatment of traveler’s diarrhea
  – Identify health problems in the returning traveler and their management
  – Special considerations: Ebola

Learning strategies

• Lecture/discussion
• Case studies
• Question & answer

Why develop travel health as a specialty part of NP/APRN practice?

• Need
  – Quiz: How many Americans travel internationally every year?
    A. 1 million
    B. 5 million
    C. 25 million
    D. 30 million

How many Americans travel internationally every year?

Answer: D

30 million (OTTI, 2009)
  – Slightly less than 10% of the U.S. population

Important resources

• www.cdc.gov
  – Travelers’ health

Travel vaccines

- Routine
  - MMR
  - Td (Tdap ®)
- Hepatitis A
- Hepatitis B
- Polio
- Typhoid
  - Oral (Vivotif ®) vs. injectable (Typhim ®)
- Yellow Fever (Yf-vax ®)

Administering vaccines safely

- Allergy history
- History of autoimmune disorders
  - GBS
- Check inventory daily for temperature, monthly for expiration
  - Safe temperature range
    - Refrigerator: 36-45 degrees Fahrenheit
    - Freezer: <6 degrees Fahrenheit
- On hand:
  - Epinephrine
  - Benadryl
  - Oxygen
  - Telephone

Rwanda case study

- Fred M., 39 y/o male is traveling to Rwanda in 14 days. He will be there for 2 weeks. He traveled there 35 years ago. He denies any reaction to vaccine. What vaccines does he need?
  - IPV
  - Typhoid vaccine
  - Yellow fever
  - Hepatitis A
  - Hepatitis B?
  - Rabies?

Malaria

- Mosquito borne parasitic infection
  - 350-500 million cases world-wide annually
  - 1-3 million deaths world-wide annually
  - Vector - female anopheles mosquito

Malaria prevention/prophylaxis

- Insect repellent
  - DEET
    - Safety – infants, children, pregnancy
- Nets
- Avoiding fragrance
- Light-colored clothing
  - Sleeves
  - Socks
- Antimalarials

<table>
<thead>
<tr>
<th>Table 1: Examples of protection times of insect repellents containing various concentrations of DEET®</th>
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<tbody>
<tr>
<td>Concentration of DEET, %</td>
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<tr>
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<tr>
<td>30</td>
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<td>15</td>
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Note: DEET = N,N-diethyl-m-toluamide, also known as N,N-diethyl-3-methylbenzamide.

Special considerations for malaria prevention

- Infants
- Children
- Pregnant women
  - DEET alternatives
    • Citronella

Malarial prophylaxis

- Antimalarial drugs
- Important factors
  - Cost
  - Side effects
  - Length of administration
  - Resistance

Antimalarials

<table>
<thead>
<tr>
<th>Drug</th>
<th>Pros</th>
<th>Cons</th>
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<tbody>
<tr>
<td>Atovaquone/Proguanil (Malarone)</td>
<td>Good for last-minute travelers  Good choice for shorter trips  Very well tolerated  Pediatric form available (for &gt;5kg)</td>
<td>Contraindicated in pregnancy or breastfeeding a child  Contraindicated in infants &lt;5 kg  Contraindicated in renal impairment  Expensive  Daily dosing</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>Daily dosing  Good for last-minute travelers  Prevents Rickettsiae and leptospirosis</td>
<td>Cannot be used by pregnant women and children &lt;8 years old  Potential photosensitivity  Need to use for 4 weeks after return home  Potential vaginal candidiasis  Photosensitivity  Has become expensive</td>
</tr>
<tr>
<td>Mefloquine (Lariam)</td>
<td>Weekly dosing  Good choice for long trips  Can be used in 2nd and 3rd trimester of pregnancy and in 1st trimester if there is no other option</td>
<td>Cannot be used in areas with mefloquine resistance  Contraindicated in certain psychiatric conditions, seizure disorder  Side effects can include depression, nightmares  Not recommended for persons with cardiac conduction abnormalities  Needs to be started at least 2 weeks prior to travel  Need to take for 4 weeks after return home</td>
</tr>
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Case study

- Fred also needs malaria prophylaxis. He has a seizure disorder, controlled with Tegretol. He also states that, with the airfare to Rwanda costing $2,000, plus the cost of the vaccines, he can’t afford expensive drugs.

  • What will we choose?
  • If his pregnant wife decides to go, what will we choose?

Traveler’s diarrhea -
Most common infectious disease for travelers:
Prevention

- Water
  - Bottled/boiled water
    • This includes tooth brushing
  - Swimming
  - Making coffee
  - Hand washing alternatives
    • Waterless hand sanitizer
- Food
  - Cooked foods only
    • “Boil it, peel it, or forget it”
    • No salads, ices, ceviche

Prevention: Common sense & more

- Make sure that coffee and tea are boiled
- Probiotics
  - Evidence shows 15% reduction incidence in traveler’s diarrhea (Culturelle)

Treatment of traveler's diarrhea

- Antimotility agents
  - Loperamide (Imodium®)
    - dry mouth
    - dizziness
    - drowsiness
    - vomiting
    - stomach pain, discomfort, or distention
    - constipation
    - fatigue

- Absorptive agents
  - Bismuth subsalicylate (Pepto-bismol®)
    - Aspirin toxicity
    - Lengthened clotting time
    - Unsafe for children

- Antimicrobials
  - 1-3 day course of therapy
  - Start at first episode of diarrhea
    - Doxycycline, 100 mg, 2x daily, x 3 days
    - Bactrim DS, 2x daily x 3 days
    - Cipro® - 500 mg, 2 x daily, x 1-3 days
      - Drug allergy
      - Tendonitis / tendon rupture


Nausea & vomiting

- Zofran (Ondansetron)
  - Adults and children >12 years
    - 8 mg dose, every 8 hours, prn
  - Children 4-11 years
    - 4 mg dose, taken again in 4 hours, then q 8 hours
  - Children <4 years
    - Refer for medical consultation

After returning home

- Advise a “RTC” if the client does not feel well
  - Fever
  - Diarrhea
  - Malaise
  - If the client came into contact with an animal

Reinforce the need to complete course of antimalarials

Infectious disease in the returning traveler

- Key points
  - Most infections are common and self limiting
  - Identify/isolate appropriate patients with transmissible infections
  - Knowing the incubation period is helpful in establishing a diagnosis
  - Where did they travel?
    - Destinations will be key in narrowing differentials
Incubation periods

- Less than 3 weeks:
  - Dengue fever
  - Leptospirosis
  - Yellow fever
  - Influenza
  - Giardia

- More than 3 weeks
  - Typhoid fever
  - Malaria
  - Tuberculosis

Differential diagnosis strategies

- Travel history
- Animal/arthropod contact
- Unprotected sexual intercourse
- Ingestion of untreated water/raw foods
- Immunization history
- Adherence to malaria prophylaxis

Etiologies of most likely post-travel infections

- Malaria
- Diarrhea
- Respiratory tract infections
- Leptospirosis
- Typhoid
- Rickettsial infections
- Dengue

Common findings and likely differentials

- Diarrhea
  - Giardia
- Fever and rash
  - Dengue fever
  - Yellow fever
  - Typhoid fever
- Cough with Pulmonary infiltrates
  - TB
- Meningoencephalitis
  - N. meningitides
- Jaundice
  - Hepatitis
  - Yellow fever

Giardiasis

- Protozoal infection of the upper small intestine
  - Giardia lamblia (parasite)
- Vector
  - Untreated water
- 10% asymptomatic
- Incubation 1-3 weeks
- Symptoms:
  - Watery diarrhea
  - Weight loss
- Diagnostics:
  - Trophozoites or cysts in stool
- Treatment:
  - Metronidazole 250 mg tid x 5-7 days
  - Albendazole 400 mg daily x 5 days
  - Pregnant patients:
    - Paromomycin 500 mg tid x 7 days

Ebola facts

• Symptoms of Ebola include
  – Fever
  – Severe headache
  – Muscle pain
  – Weakness
  – Fatigue
  – Diarrhea
  – Vomiting
  – Abdominal (stomach) pain
  – Unexplained hemorrhage (bleeding or bruising)
• Symptoms may appear anywhere from 2 to 21 days after exposure to Ebola, but the average is 8 to 10 days.


Ebola management & containment

• Refer immediately to ED
  – Call ahead to notify ED personnel
• Other common sense measures
  • Have PPE on hand
  • Remain calm
  • Remember:
    – Ebola is NOT transmissible by air!

Ebola treatment

• No FDA-approved vaccine or medicine (e.g., antiviral drug) is available for Ebola.
• Symptoms of Ebola and complications are treated as they appear.
The following basic interventions, when used early, can significantly improve the chances of survival:
  • Providing intravenous fluids (IV) and balancing electrolytes (body salts).
  • Maintaining oxygen status and blood pressure.
  • Treating other infections if they occur.


Questions & answers

References