Course Summary

WRAIR- GEIS 'Operational Clinical Infectious Disease' Course
Disclaimer

The views expressed in this presentation are those of the speaker and authors, and do not reflect the official policy of the Department of Army, Department of Defense, or U.S. Government.
Preparing The Traveler

• Know the epidemiology of the area you are traveling to
• Minimize risk through vaccines and chemoprophylaxis
• Protect the public
• Remember to tell the traveler to seek care if they develop a fever upon their return
• Personal preventive measures
• Counsel about non-infectious disease risks
• Utilize the resources available
  – id.consult.army@mail.mil
  – pmom.consult.army@mail.mil
Clinical Approach to the Return Traveler

- A detailed medical history is most important
- Think about the geographic regions traveled to and the activities/exposures encountered
- Understand that a fever in a returning traveler could be the initial sign of an infectious disease emergency
- Think horses not zebras
- Know your limitations and reach out for help early
Viral Hemorrhagic Fevers

• Bleeding, fever, and sepsis from the tropics, it needs to be considered

• Protect yourself

• Have a plan

• Know the threats and potential vectors in your AOR
  - Pay attention to outbreaks (http://www.who.int/csr/don/en/)

• Consider bringing oral ribavirin to areas endemic for Lassa, CCHF, and possibly old world hantaviruses
Traveler’s Diarrhea

• Diarrhea in the tropics is more often than not BACTERIAL
  – Diarrhea can be the presenting symptom of OTHER things

• Generally a clinical diagnosis in the field

• Boil it, cook it, peel it or forget it…..if possible

• Ciprofloxacin or Azithromycin PLUS loperamide are your friends for moderate to severe disease

• Post-infectious complications can occur

• Consider in select cases chemoprophylaxis for short travel
Leptospirosis

• Most common zoonosis found worldwide, often in tropics

• Spread through urine of infected animal, including exposure to contaminated water

• Systemic disease that is potentially fatal
  – Consider with jaundice and conjunctival suffusion
  – Biphasic disease
  – Severe cases may look like VHF

• Coinfection with other tropical diseases possible

• Treat early: Penicillins, ceftriaxone, doxycycline, macrolides, etc.
Case of *P. falciparum* malaria in a 3 yo girl

Scrub typhus eschar
Schistosomiasis

- 2nd most common parasitic disease (behind malaria)
- Worldwide distribution in tropics; freshwater exposure
- Can have both acute and chronic presentations
  - Consider the diagnosis in someone with travel history and high eosinophilia
- Diagnosis with stool/urine microscopy and serology
  - Serology may be negative in acute illness
- Praziquantel is the drug of choice
Entomology

• Prevention is key
  – Permethrin treated uniforms or clothes
  – Use DEET (30-40% sufficient) or Picardin 10-20%
  – Bednets at night
  – Chemoprophylaxis

• Know the vectors where you are and how to avoid them

• If you don’t know if something is poisonous, avoid it

• Utilize the resources available for Entomological Operational Risk Assessment
Chikungunya

- Spread by Aedes mosquito with large outbreaks possible (rapidly spreading worldwide)
- Travel + Fevers + Debilitating joint aches +/- rash
  - Chronic symptoms are possible
- Diagnosis is PCR or serology
  - Can get filter paper testing done here at WRAIR through the Viral Diseases Branch
- Supportive treatment (NSAIDs okay if definitely not dengue)
- Vaccines in development but still a few years off
Ebola

• Endemic to Subsaharan Africa (including Marburgvirus)
• Prototypical viral hemorrhagic fever with high CFR
• High risk for nosocomial spread (contact with blood/fluids)
• No good treatment options; early supportive care
  – Fluids and electrolyte management are key

• Vaccines being developed
• Post-infectious complications appear to be considerable
Efficacy and effectiveness of an rVSV-vectored vaccine expressing Ebola surface glycoprotein: interim results from the Guinea ring vaccination cluster-randomised trial


Summary

Background  A recombinant, replication-competent vesicular stomatitis virus-based vaccine expressing a surface glycoprotein of Zaire Ebolavirus (rVSV-ZEBOV) is a promising Ebola vaccine candidate. We report the results of an interim analysis of a trial of rVSV-ZEBOV in Guinea, west Africa.
Rabies

• No “pets” while deployed. Avoid dogs and cats overseas.
• Seek medical attention for any bites or saliva
  – After the virus reaches the CNS → rapid spread
  – Incubation typically 1-3 mo (can be shorter or much longer)
• Exposure + fevers + seizures/encephalitis + hydrophobia
• Consider rabies vaccinations for high risk travel
• No good treatment. Prevention is key!!!
  – Know your post-exposure prophylaxis
Animal Bites

- Dogs → crush injury with less likely to have infection
- Cats → needlelike teeth means higher risk of infection
- Hands are most likely site of bite
- Early wound care
- Early antibiotics for cat and human bites
  - Augmentin is first line
- Don’t forget tetanus shot and rabies risk assessment
Animal Bites

• Other infections:
  – Cat scratch fever (treatment questionable utility)
  – Herpes B virus from monkey bites (high fatality if not treated)
    • Need assessment for possible acyclovir or valacyclovir prophylaxis
Arboviruses

• Insect spread viral diseases (prevention of bites is key) with risks worldwide

• No treatments for infections (supportive only)
  – Avoid NSAIDs in most acute diseases

• Vaccines available:
  – Yellow fever vax for AFRICOM and areas of SOUTHCOM
    • Risk of YEL-AND and YEL-AVD
  – Japanese Encephalitis vax for PACOM
Tropical Dermatology

• Common things still occur
• Infections vs. Infestations
• derm.consult.army@mail.mil
Leishmaniasis

- 350 million at risk worldwide
- Risk to deployed military
- Cutaneous vs. Mucocutaneous vs. Visceral
  - Cutaneous worldwide and often may resolve on its own
  - Mucocutaneous found primarily in SOUTHCOM
  - Visceral disease can be fatal if not treated

- Diagnostic capability here at WRAIR
- Treatment is available but recommend ID consultation
Malaria

• 600 – 1.2 million deaths per year (mostly children) with worldwide distribution
  – Force Health Protection relevance

• Destabilizes communities in developing world

• Several species, although *P. falciparum* is most severe

• PPM + chemoprophylaxis is important in prevention

• Diagnosis with microscopy (rapid diagnostics helpful)

• Treat severe malaria with IV Artesunate
  – Drug resistance is an evolving problem especially in PACOM
Malaria

• Treatment options for uncomplicated *P. falciparum*:
  – Proguanil / atovaquone (Malarone®)
  – Artemether-lumefantrine (Coartem®)
  – Quinine sulfate + doxy or PS
  – Mefloquine (Lariam®)
  – Chloroquine (Aralen®) – select areas of the world
<table>
<thead>
<tr>
<th>Drug</th>
<th>Tablet Size</th>
<th>Dose</th>
<th>Start (pre-deploy)</th>
<th>Stop (re-deploy)</th>
<th>Disadvantages</th>
<th>Pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malarone (Atovaquone/Proguanil)</td>
<td>250mg/100mg</td>
<td>One tablet daily</td>
<td>1-2 days</td>
<td>7 days</td>
<td>Expensive, no if Cr Cl &lt;30 ml/min, must be taken with food</td>
<td>No</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>100mg</td>
<td>100mg daily</td>
<td>1-2 days</td>
<td>4 weeks</td>
<td>Photosensitivity, gastritis/esophagitis (must give with liquid, full stomach, upright for 30 minutes), vaginitis</td>
<td>No</td>
</tr>
<tr>
<td>Mefloquine</td>
<td>250mg</td>
<td>250mg weekly</td>
<td>3 wks preferable, 1-2 OK</td>
<td>4 weeks</td>
<td>Resistance in SE Asia, Black box for depression/neurotoxicity, cardiac conduction abnormalities</td>
<td>Yes</td>
</tr>
<tr>
<td>Chloroquine</td>
<td>500mg (300mg base)</td>
<td>500mg weekly</td>
<td>1 week</td>
<td>4 weeks</td>
<td>Resistance, pruritus in dark-skinned persons, rare blood dyscrasias, psoriasis, hx of psychosis, prolonged QT, rare retinopathy</td>
<td>Yes</td>
</tr>
<tr>
<td>Primaquine</td>
<td>26.3mg (15mg base)</td>
<td>30mg base</td>
<td>1 day</td>
<td>7 days</td>
<td>G6PD, food (gastric irritation), methemoglobinemia</td>
<td>No</td>
</tr>
<tr>
<td>Primaquine</td>
<td>26.3mg (15mg base)</td>
<td>30mg base</td>
<td>Protection against late relapse Pv/Po</td>
<td>Total of 14 days (6mg/kg total dose)</td>
<td>G6PD, food (gastric irritation), methemoglobinemia</td>
<td>No</td>
</tr>
</tbody>
</table>

Adapted from Freedman D, NEJM 2008
Dengue

• Global burden of disease increasing
  – 4 different serotypes w/ more severe disease with subsequent infections
  – Deployed service members at risk

• Spread by Aedes mosquito

• Fevers + bone pain + rash + retroorbital headache in a traveler

• WRAIR can perform filter paper testing (rapid tests available outside of U.S)

• No specific treatment; Supportive care and WHO fluid management algorithm

• Vaccines in development (skeptical that drugs will be the answer)
Rickettsia

- Fever + headache + transaminitis + thrombocytopenia +/- rash, consider rickettsioses
- Look for eschars
- Know what is endemic to your AOR and how it is transmitted
  - Different infections found throughout the world
- Some can have high mortality without treatment
  - NO ONE DIES WITHOUT DOXYCYCLINE (consider azithromycin in PACOM in areas of Thailand)
HIV

• Huge burden of disease in Sub-Saharan Africa

• Recognize the possible signs of acute HIV infection

• Chronic HIV infection diagnosed through screening or presentation of opportunistic diseases

• Combination therapy key to treatment

• Rapid tests available and FDA approved

• Post-Exposure Prophylaxis as soon as possible for 4 weeks
  – Test both exposed and the source
  – Recommended regimen: Truvada + Raltegravir (Isentress)
Respiratory Viral Threats

• Influenza transmitted year round in the tropics
  – Vaccination important even if potential mismatches

• Isolate patients with severe respiratory disease until more info is known (nosocomial risk for novel flu and MERS-CoV)

• Avoid poultry or pigs in areas known to have respiratory disease

• Oseltamivir for severe influenza
Tuberculosis

• Active Tb vs. Latent Tb
  – Active = symptoms → 4 drug RIPE regimen + isolation initially
    • Report to Prev Med for contact tracing
    • Requires directly observed therapy
  – LTBI = asymptomatic with positive PPD → 1 drug

• Targeted testing for HIGH RISK is the rule
• Measure the swelling not the redness of the TB skin test
• Resistant TB a concern, especially AFRICOM and with HIV coinfection
Trypanosomiasis

• African = Sleeping Sickness
  – East African progresses faster; more rapidly fatal
  – Transmitted by bite of Tse Tse fly
  – May be associated with a painless chancre at bite
    • Nonspecific illness with possible rash and lymphadenopathy
  – Late stage infection in CNS progressing to coma and death
  – Treatments are fraught with toxicities
Trypanosomiasis

• American = Chagas disease
  – Transmitted primarily by triatomine bug (Kissing bug)
  – Acute illness generally asymptomatic, possibly with mild fever or swelling at bite site (Romana’s sign)
  – Chronic disease can develop:
    • Cardiac dysfunction
    • Megaesophagus or Megacolon
  – Primarily diagnosed now with serologic testing (blood donors)
  – Treatment most effective during the acute stage of infection
Biothreats in the Tropics

• Brucella
  – Worldwide distribution
  – Associated with exposure to livestock or unpasteurized daily products; can be aerosolized
  – Typically presents as fever of unknown origin
    • Back pain due to sacroilitis classic
  – Diagnosis typically via serology
  – Treatment with combo (doxy or septra + rifampin for 6 wks)
    • Relapses may occur despite complete treatment
Biothreats in the Tropics

• Q Fever (Coxiella burnettii)
  – Transmission through aerosol contact with infected animals or eating unpasteurized dairy
  – Presents with fever +/- pneumonia and/or hepatitis
  – Diagnosis typically via serology
  – Acute disease can be treated with doxycycline for 14 days
  – Chronic complications can occur (e.g. endocarditis)
    • Need to get infectious diseases involved due to long treatment course for chronic disease

  – Vaccine (Q-Vax available in Australia or Eastern Europe)
    Also one from USAMRIID through IND…..
Biothreats in the Tropics

• Plague (Bubonic, Septicemic, and Pneumonic)
  – Can have high case fatality rates if untreated
  – Spread by flea bites, respiratory droplets, or can be aerosolized as biological warfare
  – Bubonic plague with swollen, painful lymph nodes
  – Treatment:
    • Gentamicin or Doxycycline or Ciprofloxacin INTRAVENOUSLY x 10-14 days
    • Chloramphenicol for meningeal disease
Biothreats in the Tropics

• Anthrax (cutaneous, GI, pulmonary)
  – Worldwide distribution; death possible in all 3 forms
  – Associated with exposure to livestock; spores can be aerosolized
  – Black eschar in cutaneous form
  – Rapid respiratory collapse in pulmonary disease
    • Need recognition and early treatment → nearly all die if started late
  – Diagnosed with serology generally with clinical suspicion
  – Cipro and Doxy are first line drugs x 60 days if felt to be bioterror attack
QUESTIONS?