Tropical Fever Evaluation

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Presentation Objectives

At the completion of this presentation, participants will be able to:
• Identify the unique challenges to evaluating tropical fever
• Employ an effective rationale in differential diagnosis
• Develop reliance upon only limited diagnostic aids
Not Addressed Today:
Fever Among Travelers
Why Is Evaluating Fever In A Tropical Setting Uniquely Challenging???
Tropical Fever Challenges

- Unfamiliar causes
- Unusual causes
- Limited laboratory and imaging
- Cultural unfamiliarity
- Out of practice clinical skills
- Time pressure
What Do You Know About Pathogenesis Of Fever?
Fever Most Commonly Is...

- A physiological response to infection, mediated principally via cytokines.
- Cytokines alter thermoregulation in the hypothalamus through a process mediated by prostaglandins.
What Non-Infectious Etiologies Cause Fever?
Non-Infectious Cause Of Fever

- Malignancies, especially lymphomas, leukemias, and renal cell CA
- Autoimmune diseases, including rheumatoid arthritis, temporal arteritis, polyarteritis nodosa
- Drug reactions
Multitude of Potential Infectious Etiologies Exist For Febrile, Tropical-Locale Patients.
Clinical Approach To Febrile Tropical-Locale Patients

The Search For Clues
Approach To Febrile Tropical-Locale Patients: Epidemiology

- Knowledge of local epidemiology is extremely useful in assessing risk
- Local epidemiology may change suddenly with occurrence of epidemics, such as Marburg virus
Where Is Influenza Common?
Herd Immunity

If only SOME get vaccinated...
...the virus spreads.
Healthy, non-vaccinated Healthy, vaccinated Not-vaccinated, sick, contagious

If MOST get vaccinated...
...spreading is contained.
New Influenza A (H1N1), Number of laboratory confirmed cases as reported to WHO

Status as of 26 June 2009 06:00 GMT

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

Chinese Taipei has reported 61 confirmed cases of influenza A (H1N1) with 0 deaths. Cases from Chinese Taipei are included in the cumulative totals.

Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS) World Health Organization

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Influenza
Where Is Typhoid Common?
Typhoid Distribution
Where Is Yellow Fever Common?
Approximate Global Distribution of Yellow Fever, by State/Province, 2007

Yellow Fever Distribution
Where Is Malaria Common?
Malaria Distribution

Malaria cases (per 100,000) by country, latest available data

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Data Source: WHO/Malaria Department
Map Production: Public Health Mapping Group, Communicable Diseases (CDS)
World Health Organization
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Where Is Measles Common?
Measles Vaccine Coverage
Where Is TB Common?
Tuberculosis Incidence

Tuberculosis, estimated new cases, 2007

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Where Is HIV Common?
HIV Prevalence
Where Is Dengue Common?
Dengue Distribution
Approach To Febrile Tropical-Locale Patients
What Clues Can Be Gleaned From The History?
Approach To Febrile Tropical-Locale Patients: History

- Rigors & night sweats suggest a febrile illness even if the patient is afebrile
- Weight loss suggests significant disease
- Pattern of fever is rarely helpful
- A self-recorded temperature chart may be useful
- Upper Respiratory Infection symptoms suggest viral cause
Approach To Febrile Tropical-Locale Patients: History

• Freshwater exposure suggests schistosomiasis
• In children, feeding, weight change, and activity are useful measures
• Localizing symptoms should be sought, such as headache, photophobia, cough, sputum, pleurisy, painful sites, diarrhea, urinary symptoms
What Clues Can Be Gleaned From The Exam?
Approach To Febrile Tropical-Locale Patients: Exam

- Pulse rate > 120 or systolic BP <100 suggest serious illness
- Spontaneous hemorrhage suggests viral hemorrhagic fever
- Psychosis (typhoid)
- Altered consciousness or neck stiffness (meningitis)
What Is This Finding?
Approach To Febrile Tropical-Locale Patients: Exam

- Cervical and axillary adenopathy (TB, HIV, CMV, EBV, lymphoma, toxo, syphilis)
- Occipital adenopathy (rubella, American trypanosomiasis)
- Inspect eyes for anemia, jaundice, conjunctival injection (measles, leptospirosis)
- Inspect fundi for endocarditis
- TMs in children
Approach To Febrile Tropical-Locale Patients: Exam

• Chest exam for pneumonia, pleural or pericardial effusion (TB, empyema)
• Heart murmurs (endocarditis, rheumatic disease)
• Abd tenderness (appendicitis, peritonitis, PID, amebic liver abscess)
Approach To Febrile Tropical-Locale Patients: Exam

- Hepatomegally (malaria, TB, hepatitis, schisto, hepatoma, liver abscess)
- Splenomegally (malaria, typhoid, leishmaniasis, HIV, mono, lymphoma, leukemia, portal HTN, disseminated TB, brucellosis)
- Ascities (tap)
- Joint effusions (tap)
Approach To Febrile Tropical-Locale Patients: Exam

Put Some Skin in the Game!
What Does This Suggest?
What Is This Finding?
Approach To Febrile Tropical-Locale Patients: Exam

• Inspect mouth for candidiasis (HIV), Koplick spots (measles), and pharyngitis
• Rash (viral exanthems, meningococcal patechiae)
• Eschar (tick-borne rickettsia infection)
• Anesthetic patches with pigmentary changes (leprosy)
• Skin signs for cellulitis
What Clues Can Be Gleaned From Lab & Imaging?
Approach To Febrile Tropical-Locale Patients: Lab & Imaging

- Malaria smears and/or rapid test in malaria areas
- Renal functions (sepsis, severe malaria)
- Liver functions (viral hepatitis)
- ESR or CRP (general assessment, SLE)
- Acute & convalescent serum for retrospective diagnosis
- Ultrasound for liver abscess, splenomegally
Approach To Febrile Tropical-Locale Patients: Lab & Imaging

- CXR (TB, pneumonia)
- Blood cultures (typhoid)
- UA (bacteria infection, schistosomiasis)
- Stool O & P
- Sputum AFB
- Lumbar puncture
- HIV and hepatitis ab tests
- Syphilis serology
- Genital swab for micro
Appropriate Uses Of Technology

For what tropical febrile diseases are rapid diagnostic tests available?
Appropriate Uses Of Technology

Rapid diagnostic tests for leptospirosois, syphilis, malaria, visceral leishmaniasis, typhoid, trypanosoma
Tropical Fever Evaluation Grid

• Based on time line, malaria smears and WBC count and differential
• Omitted are those conditions with obvious localizing signs, such as pyogenic arthritis
• Includes only more common causes
Tropical Fever Evaluation Grid

*Common causes & fever < two weeks:*
- Negative malaria smears
- Neutrophilia: pyogenic infections, leptospiral infections, amebic liver abscess, relapsing fevers (*Borrelia*)
- No neutrophilia: viral infections, rickettsial infections, typhoid
Tropical Fever Evaluation Grid

*Common causes & fever > two weeks:*

- Negative malaria smears
- *Neutrophilia*: sepsis, amebic liver abscess, cholangitis, relapsing fever, erythema nodosum leprosum
Tropical Fever Evaluation Grid

Common causes & fever > two weeks:
• Negative malaria smears
• *Eosinophilia*: invasive hepatic schistosomiasis (*S. mansoni*), invasive *Fasciola hepatica* infection, acute exacerbations of lymphatic filariasis (*Wuchereria bancrofti*), visceral larva migrans (*Toxocara canis*)
Common causes & fever > two weeks:
- Negative malaria smears
- *Neutropenia*: malaria, disseminated TB, visceral leishmaniasis, brucellosis, influenza, dengue, yellow fever
Tropical Fever Evaluation Grid

*Common causes & fever > two weeks:*
- Negative malaria smears
- *Normal WBC:* HIV, localized TB, brucellosis, secondary syphilis, trypanosomiasis, toxoplasmosis, endocarditis
What Is The Natural History Of Tropical Fevers?
At least 50% of adults and older children with genuine fever will have no cause identified and fever will resolve spontaneously in a few days.
But Remain Vigilant Because:

If the cause is not immediately apparent, it may become so in a few days.
When Should Empirical Treatment Be Initiated?
When Should Empirical Treatment Be Initiated?

• In adults it is preferable to delay anti-infective treatment until diagnosis is made
• It is poor practice to treat malaria empirically unless no diagnostic test is available
When Should Empirical Treatment Be Initiated?

• In ill appearing children with leukocytosis empirical treatment may be prudent
• Suspected sepsis or meningitis should be treated immediately
• Severe pharyngitis should be treated with a low threshold given the increased frequency of post-streptococcal complications.
When Should Empirical Treatment Be Initiated?

• In many low-resource, tropical regions malaria is the most common cause of febrile illness.
• If malaria treatment fails, consideration is next given to typhoid fever.
• If typhoid treatment fails, consideration is then given to tuberculosis
Tropical Fever Evaluation: One Of Clinical Medicine’s Greatest Challenges
Polish your skills to serve forgotten people

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