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TODAY’S LECTURE

Clues to Diagnose Clinically Dengue, Chikungunya and Zika

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Presented April 10, 2018
DISCLOSURES

• Dr. Ana L. Medina does not have any conflicts of interest to disclose.
ACKNOWLEDGMENTS

- Centers for Disease Control and Prevention (CDC) Puerto Rico Branch
- World Health Organization
- Pan American Health Organization
- Clinicians for the Dengue Control Research Programme (DENCO)
- Dr Lucy Lum (University of Malaysia)

This project is supported by the Maternal and Child Health Bureau, Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) under grant number U43MC09134
OBJECTIVE

• Understand the similarities and differences in the clinical manifestations of dengue, chikungunya and zika
**Dengue**

- Dengue is a **systemic** and **dynamic** disease
- Its clinical manifestations are diverse, and range from an asymptomatic or mild viral illness, to a more severe disease
- Its onset is **ABRUPT**
- 3 Phases:
  - Febrile Phase (2-7 days)
  - Critical Phase (fever defervescence) (vascular leakage)
  - Recovery Phase (Resorption)
**Probable Dengue**

Live in/travel to dengue endemic area and fever with two of the following (CDC 2009):

- Nausea and vomiting
- Rash
- Leucopenia
- Positive tourniquet test
- Aches and pains (headache, retro orbital eye pain, myalgias, arthralgias)
- Warning signs
DENGUE WARNING SIGNS: PLASMA LEAKAGE

Usually when temperature drops <38 C
- Restlessness; Lethargy
- Mucosal bleed
- Persistent vomiting
- Severe abdominal pain or tenderness
- Liver enlargement >2cm
- Clinical fluid accumulation (ascites, pleural, pericardial effusions)
- Laboratory increase in Hct concurrent with rapid decrease in platelets

HOSPITALIZATION NEEDED!

Source: CDC, 2009
**Dengue Warning Signs**

- In 2017, WHO/PAHO Dengue Classification:
  - POSTURAL HYPOTENSION ADDED AS A NEW WARNING SIGN!!
As you can see in new Dengue classification, focus is not platelet count. Focus is on severe manifestations.

The terms Dengue, DHF and DSS are substituted for Dengue and Severe Dengue
**Dengue: Basic Important Facts**

• Increased vascular permeability is the most important feature that differentiates Dengue from Severe Dengue

• This excessive capillary plasma leakage leads to dehydration and hypovolemic shock

• Plasma leakage can be mild to severe; insidious or abrupt and fluid goes to body cavities (pleural, abdominal)
  – Severe hemorrhage is unusual and usually occurs only after prolonged hypovolemic shock and acidosis
**Warning Signs Most Associated with Severe Dengue**

- Severe abdominal pain
- Lethargy
- Mucosal bleed
PLASMA LEAKAGE

Photo: Dengue Clinical Case Management Course, CDC Puerto Rico Branch
SEVERE DENGUE

- Evidence of pleural effusion and ascites

Photos: Dengue Clinical Case Management Course, CDC Puerto Rico Branch

Suchitra Nimmannitya
Rashes in Dengue

Typically uncomplicated DHF/DSS lasts for 10 to 12 days.

With sudden onset of fever:
Flushing or erythema of face, neck and chest for 1 to 2 days. May have injected pharynx and red lips.

Critical Phase

Convalescent Phase

Febrile Phase

Afebrile

Not viremic

Incubation

Viremic

Mosquito bite

* Typically uncomplicated DHF/DSS lasts for 10 to 12 days

Photo: Dengue Clinical Case Management Course, CDC Puerto Rico Branch
**Rashes in Dengue**

- **Mosquito bite**

  **Incubation**

  **Viremic**

  **Febrile Phase**

  **Critical Phase**

  **Convalescent Phase**

  **Afebrile**

  **Not viremic**

- **Days 2 to 6:** Macular or maculopapular truncal rash that spreads to face and extremities.

*Typically uncomplicated DHF/DSS lasts for 10 to 12 days*

Photo: Dengue Clinical Case Management Course, CDC Puerto Rico Branch
DENGUE RASHES

Photo:
Dengue
Clinical Case
Management
Course, CDC
Puerto Rico
Branch
“Islands of white in the sea of red” convalescent rash.
J Pediatrics 1997; 131(4): 516-524
POSITIVE TOURNIQUET TEST

Photo: Dengue Clinical Case Management Course, CDC Puerto Rico Branch
CHIKUNGUNYA

Alphavirus

The majority of patients with chikungunya become symptomatic (~90%)

On the contrary, the majority of patients infected with dengue or zika have asymptomatic or subclinical illness
CHIKUNGUNYA

- Abrupt onset fever (typically >39 C)
- Polyarthralgia/arthritis: usually bilateral and symmetric and can be severe and debilitating
- Small and distal joints: knees, elbows, ankles, feet, wrists, hands affected frequently
- Headache
- Eye pain
- Myalgias
- Conjunctivitis
- Rash: morbilliform maculopapular frequent
- Nausea and vomit
- Persistent joint symptoms for months to years reported
Chikungunya

Photo: Dengue Clinical Case Management Course, CDC Puerto Rico Branch
CHIKUNGUNYA

Photo: Dengue Clinical Case Management Course, CDC Puerto Rico Branch
CHIKUNGUNYA RASH

Photo: Property of Dr. Ana Medina
Zika Virus: Symptoms of Infection

• Most people infected with Zika virus do not experience any symptoms.
• About 1 in 5 people will become sick, usually with a mild illness.
• Common symptoms include:
  – Abrupt onset
  – Mild fever(<39 C)
  – Skin rash/pruritis
  – Arthralgias
  – Conjunctivitis
  – Nausea, vomits, diarrhea
  – Fatalities are rare

ZIKA VIRUS

Photo: Property of Dr. Ana Medina
ZIKA VIRUS

Photo: Property of Dr. Ana Medina
RETROAURICULAR NODE IN ZIKA

Photo: Property of Dr. Ana Medina
ZIKA IN YOUNG CHILD

Photo: Property of Dr. Ana Medina
ZIKA IN YOUNG CHILD

Discreet maculo papular facial rash

Photo: Property of Dr. Ana Medina
Zika

Fine maculo papular erythematous rash

Usually cephalad to caudal
Dengue, Chikungunya, Zika

- Dengue and Chikungunya are high viremic viruses, thus the high fevers and marked general malaise, and body aches.
- Zika virus is a low viremic virus, thus low fevers and mild constitutional symptoms.
- In Zika, nevertheless, the affected fetus seems to have a chronic viremia.
**Similarities Between Dengue, Chikungunya and Zika**

- Abrupt onset fever/chills (lower fever in Zika and less chills in Zika)
- Headache
- General malaise
- Nausea/vomits/diarrhea
- Rash
- Conjunctivitis
- Arthralgias/Myalgias
- CNS autoimmune disorders
- Hepatitis
- A aegypti vector
- Similar endemic area
CLINICAL CLUES FOR DENGUE INFECTION

• Rash
  • Early facial rash; sometimes is the only rash reported
  • Pruritic rash in late or recovery/convalescent phase
  • Arthralgias / Myalgias
• Headache & retro orbital pain (EOM myalgias)
• Sudden fever and lumbar pain or abrupt lumbar pain followed several hours later by fever***
• Positive Tourniquet Test
• Leukopenia
• Warning signs, especially ABDOMINAL PAIN
• Pt feels weak and dizzy when getting up
• Pleural effusions in Chest X-ray after fever defervescence
• Shock after fever goes away
• After fever defervescence, bradycardia and subnormal temperature seen in most patients***
• Other family members with similar- non respiratory illness
• Endemic area
CLINICAL CLUES FOR CHIKUNGUNYA INFECTION

• High fever (sometimes 105-106 F in patients who never had such high fevers in previous illnesses)
• Polyarthralgias, especially small joints hands, wrists, feet, ankles
• Debilitating joint pains; patients tend to fall or simply do not want to get up or cannot walk
• Lymphopenia / Leukopenia
• Morbilliform rash
• Other family members with similar non-respiratory illness
• Endemic area
CLINICAL CLUES FOR ZIKA INFECTION

- Mild general malaise
- Fever usually <39 C = 102.2 F
- Arthralgias, myalgias (mild), including periarticular edema (esp hands), marked edema, but mild discomfort!
- Rash OR PRURITIS early in illness or as the only manifestation!!
- Rash over cheeks
- Retroauricular node(s)
- Conjunctivitis
- Guillain-Barré
- Other family members with similar mild non-respiratory illness
- Endemic area
**Most Frequent Reason to Consult MD or Acute Clinic/ER**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dengue</td>
<td>Fever &amp; Myalgias</td>
</tr>
<tr>
<td>Chikungunya</td>
<td>Fever &amp; Joint Pain</td>
</tr>
<tr>
<td>Zika</td>
<td>Rash / Pruritus</td>
</tr>
</tbody>
</table>
### Table 1. Signs and symptoms of dengue, chikungunya, and Zika arbovirus infections

<table>
<thead>
<tr>
<th>SIGNS AND SYMPTOMS</th>
<th>DENGUE</th>
<th>CHIKUNGUNYA</th>
<th>ZIKA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most frequent reason for consultation</td>
<td>Fever, myalgia</td>
<td>Joint pain, fever</td>
<td>Exanthema or pruritus</td>
</tr>
<tr>
<td>Fever</td>
<td>Moderate Very frequent Dura10rs: 5 to 7 daysa</td>
<td>Very high Very frequent Duration: 3 to 5 daysa</td>
<td>Mild Very infrequent Duration: 1 to 3 daysa</td>
</tr>
<tr>
<td>Rash</td>
<td>Appears between days 5 and 7 Non-characteristic</td>
<td>Appears on day 2 or 3 Non-characteristic</td>
<td>Typically from day 1: maculopapular, cefalocrural</td>
</tr>
<tr>
<td>Pruritus</td>
<td>Mild to intense</td>
<td>Mild to moderate</td>
<td>Moderate to intense</td>
</tr>
<tr>
<td>Conjunctivitis</td>
<td>Infrequent</td>
<td>Not very frequentb</td>
<td>Very frequent</td>
</tr>
<tr>
<td>Neurological manifestations</td>
<td>Infrequent</td>
<td>Infrequent (can be frequent and serious in neonates)</td>
<td>Possible and serious</td>
</tr>
<tr>
<td>Headache</td>
<td>Intense and frequent</td>
<td>Mild to moderate</td>
<td>Mild to moderate</td>
</tr>
<tr>
<td>Retro-ocular pain</td>
<td>Intense and frequent</td>
<td>Infrequent</td>
<td>Infrequent</td>
</tr>
<tr>
<td>Polyarthritis</td>
<td>Absent</td>
<td>Very frequent</td>
<td>Frequent</td>
</tr>
<tr>
<td>Polyarthrosis</td>
<td>Absent</td>
<td>Frequent</td>
<td>Frequent</td>
</tr>
<tr>
<td>Edema in hands and feet</td>
<td>Infrequent</td>
<td>Frequent</td>
<td>Infrequent</td>
</tr>
<tr>
<td>Evolution to chronic form</td>
<td>No</td>
<td>Very frequent</td>
<td>Not described</td>
</tr>
<tr>
<td>Malaria</td>
<td>Very frequent and intense</td>
<td>Very frequent Moderate to intense</td>
<td>Infrequent</td>
</tr>
<tr>
<td>Hepatomegaly</td>
<td>Warning sign</td>
<td>Very Infrequent</td>
<td>Very Infrequent</td>
</tr>
<tr>
<td>Frequent vomiting</td>
<td>Warning sign</td>
<td>Very Infrequent</td>
<td>Very Infrequent</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>Frequent</td>
<td>Very Infrequent</td>
<td>Very Infrequent</td>
</tr>
<tr>
<td>Intense abdominal pain</td>
<td>Warning sign</td>
<td>Not present</td>
<td>Not present</td>
</tr>
<tr>
<td>Skin bleeding</td>
<td>Frequent</td>
<td>Very Infrequent</td>
<td>Very Infrequent</td>
</tr>
<tr>
<td>Mucosal bleeding</td>
<td>Warning sign</td>
<td>Very Infrequent (when present, it is serious)</td>
<td>Very Infrequent</td>
</tr>
<tr>
<td>Shock</td>
<td>More frequent in the severe forma</td>
<td>Infrequent</td>
<td>Unknown</td>
</tr>
<tr>
<td>Leukopenia</td>
<td>Moderate to intense</td>
<td>Mild to moderate</td>
<td>Mild to moderate</td>
</tr>
<tr>
<td>C-reactive protein</td>
<td>Normal</td>
<td>Elevated</td>
<td>Elevated</td>
</tr>
<tr>
<td>High hematocrit level</td>
<td>Warning sign</td>
<td>Infrequent</td>
<td>Infrequent</td>
</tr>
<tr>
<td>Platelet count</td>
<td>Normal to very low</td>
<td>Normal to low</td>
<td>Normal to low</td>
</tr>
<tr>
<td>Special considerations</td>
<td>Risk of death</td>
<td>Can evolve to chronic arthropathy</td>
<td>Risk of congenital infection and GIS</td>
</tr>
</tbody>
</table>

a With dengue, a drop in fever between days 3 and 5 of the disease can actually be associated with onset of severity.
b Conjunctivitis is uncommon in CHIKV infection, but this symptom is more frequent in children.

QUESTIONS?

THANK YOU

GRACIAS