Global Health Cast - Summary
Three short lessons on Dengue

Dr. Melvin Sanicas
@Vaccinologist

Prof. Dr. Joe Schmitt
@Prof_Schmitt

Part 1: General Overview
Part 2: Clinical aspects
Part 3: Epidemiology
Global Health Cast – Key Points

Clinical aspects of dengue

- Fever
- Myalgia, Arthralgia
- Nausea, Vomiting
- Rash
- Scattered petechiae
- Retroorbital pain
- Headache

**Febrile phase**

**Critical phase**

- Potential clinical issues:
  - Shock
  - Bleeding
  - Organ impairment

**Recovery phase**

- Viraemia
- IgG/IgM

Inflammatory host response:
- Capillary leakage

[Platelet count < 150,000]

[https://www.nature.com/articles/nrcardio.2014.40/figures/1]
Diagnosing DF: Clinical Warning Signs

**DENGUE WITHOUT WARNING SIGNS**
- Live in/travel to a dengue endemic area, fever and any two:
  - Nausea or vomiting
  - Rash
  - Aches and pains
  - Tourniquet test – positive
  - Leukopenia

**DENGUE WITH WARNING SIGNS**
- Abdominal pain or tenderness
- Persistent vomiting
- Fluid accumulation
- Mucosal bleed
- Lethargy or restlessness
- Liver enlargement
- Increased hematocrit with decreased platelet count

**SEVERE DENGUE/DHF**
- Plasma leakage, shock, and/or fluid accumulation
- Severe bleeding
- Severe organ impairment

Severe disease cannot be predicted and may develop without warning signs.

Taken from: Ng & Meyer (2022): Course: 54 - Dengue (vaccitutor.com)
Antibody Disease Enhancement (ADE)

1. Low titers of antibodies from previous DV-infections bind to DV
2. No killing, but Fcɤ receptor binds to human cell and brings DV into cell
3. Viral replication
## DF: Differential Diagnosis

<table>
<thead>
<tr>
<th></th>
<th>Fever</th>
<th>Headache</th>
<th>Joint/muscle pain</th>
<th>Rash</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dengue</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Influenza</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Typhoid</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Chikungunya</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Leptospirosis</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Malaria</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Zika</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Taken from: Ng & Meyer (2022): Course: 54 - Dengue (vaccitutor.com)
# Laboratory Confirmation of DF: The Options

<table>
<thead>
<tr>
<th>Method</th>
<th>Assay</th>
<th>How does the test diagnose dengue?</th>
</tr>
</thead>
<tbody>
<tr>
<td>IgM antibody detection</td>
<td>MAC-ELISA or RDT</td>
<td>- Detects IgM antibodies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Used for routine diagnosis of dengue</td>
</tr>
<tr>
<td>IgG antibody detection</td>
<td>IgG ELISA or RDT</td>
<td>- Detects IgG antibodies from samples taken early and late in the illness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Used to diagnose a past infection</td>
</tr>
<tr>
<td>NS-1 antigen detection</td>
<td>NS-1 ELISA or RDT</td>
<td>- Detects a specific dengue antigen called NS-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Used to diagnose an on-going infection as early as 1 day after symptoms develop</td>
</tr>
<tr>
<td>Neutralizing antibody detection</td>
<td>Plaque reduction and neutralization test (PRNT)</td>
<td>- Measures the amount of neutralizing antibodies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Used to determine the serotype of the virus</td>
</tr>
</tbody>
</table>

Taken from: Ng & Meyer (2022): Course: 54 - Dengue (vaccitutor.com)
Dengue Podcasts:

Global Health Cast – Dengue Vaccines – Global Health Press (id-ea.org)
