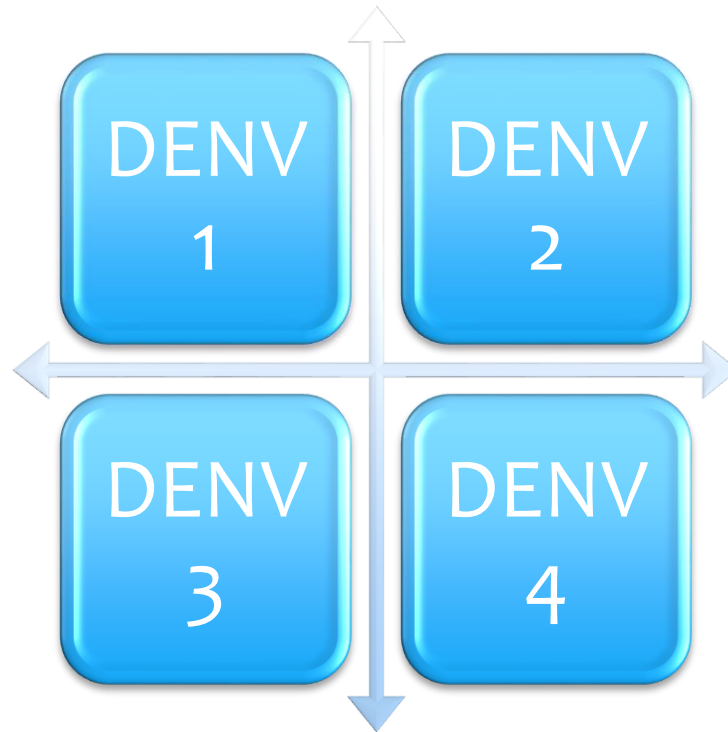


CLINICAL FEATURES AND DIAGNOSIS IN PATIENTS WITH DENGUE INFECTION

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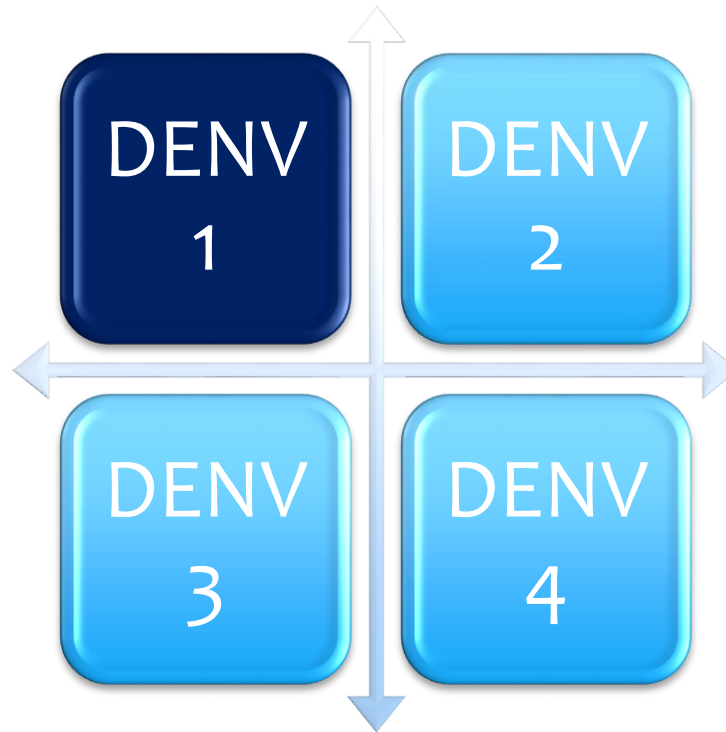
DENGUE VIRUS SEROTYPES



Dengue virus

Life long
immunity

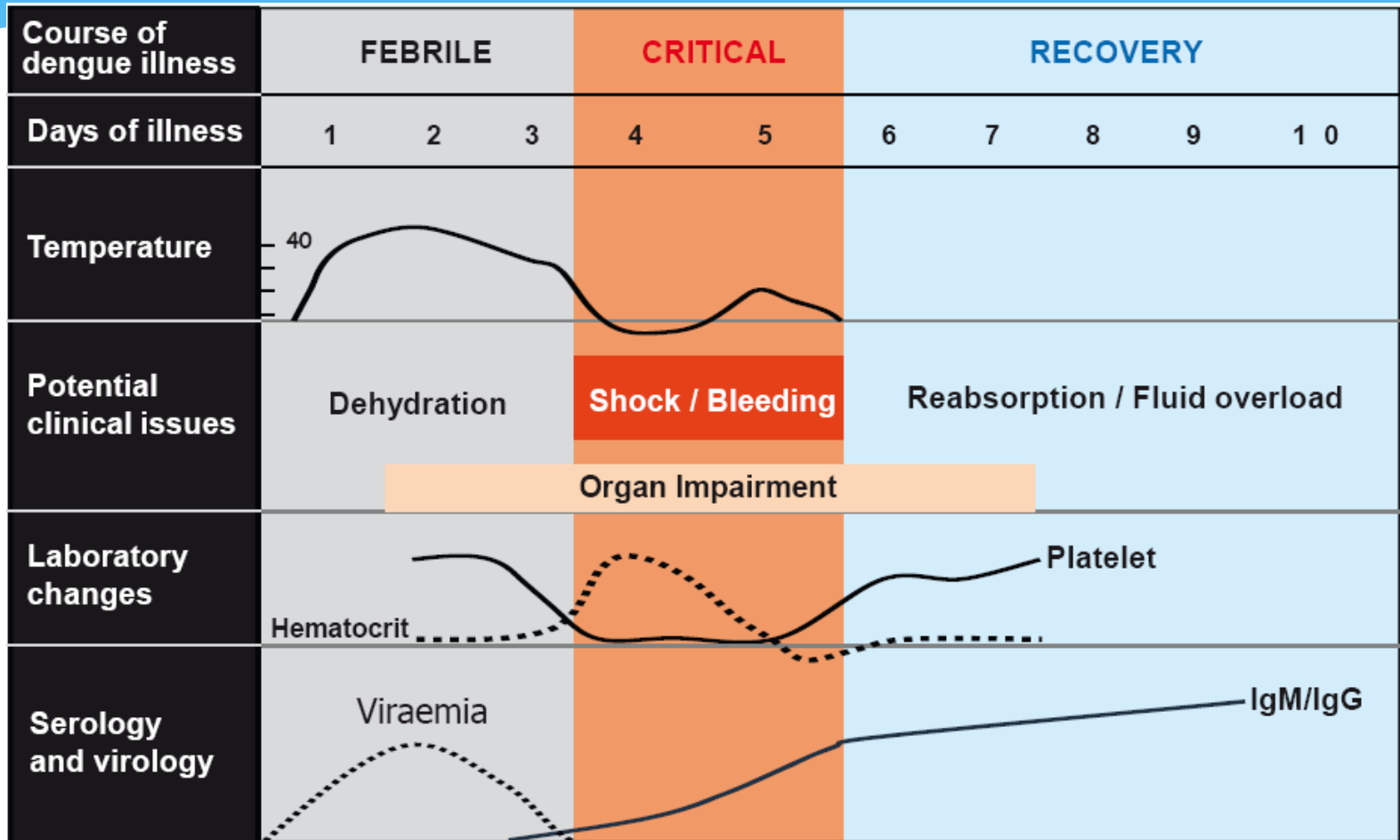
Short term
cross-
protection



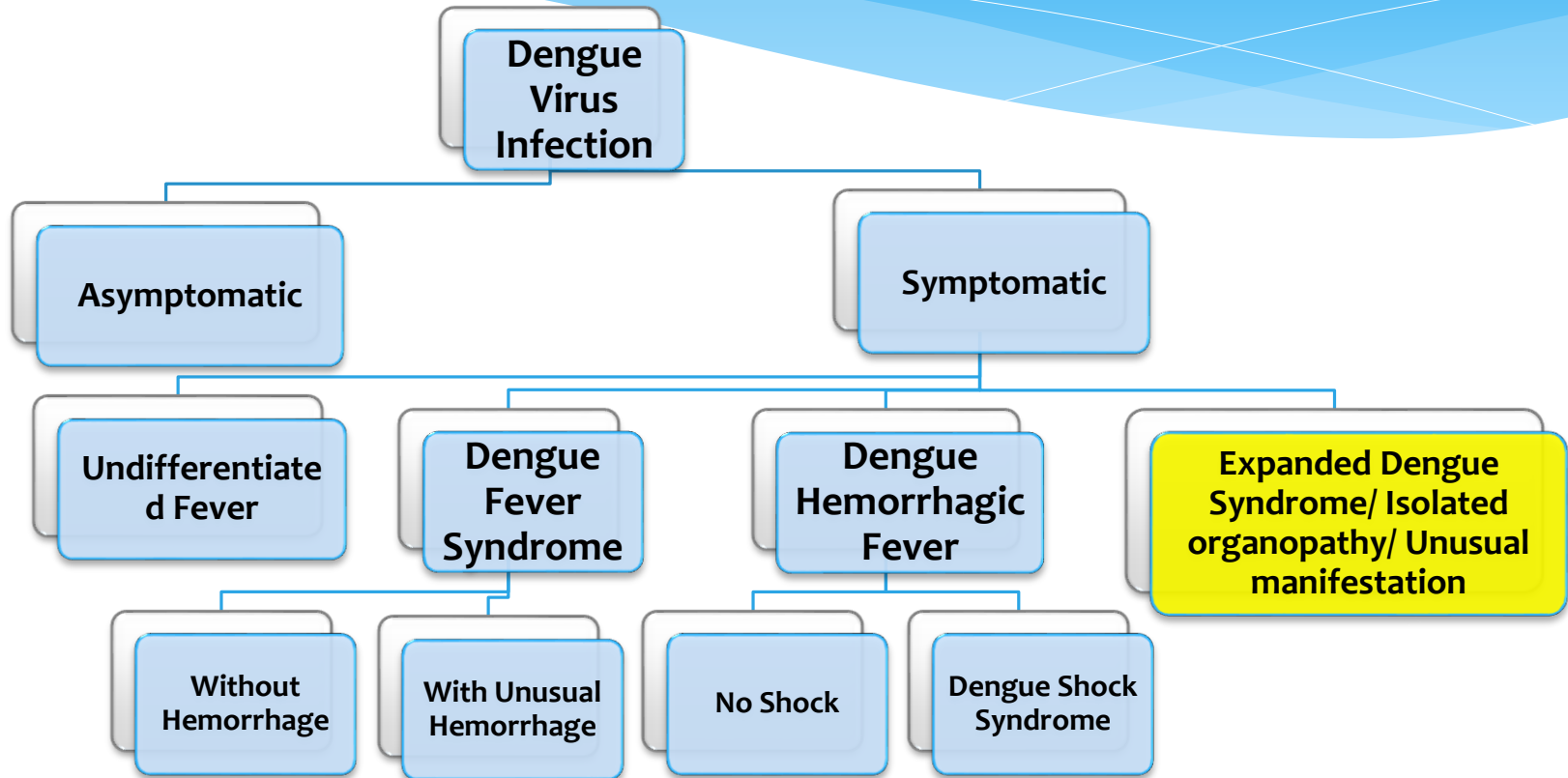
Short term
cross-
protection

Short term
cross-
protection

Clinical Course of Dengue Infection



Dengue Virus Infections WHO 2011 Classification System



Case Definition for Dengue Fever

- * Probable
- * Confirmed
- * Reportable

DEAG Case Definition

Suspected

Probable

Confirmed

Suspected

Clinical Criteria:

- Fever of 2 to 10 days duration (essential criterion) and two of the followings:
- Headache
- Retro orbital pain
- Myalgia
- Arthralgia/ severe backache/ bone pains
- Rash
- Bleeding manifestations (epistaxis, hematemesis, bloody stools, menorrhagia, hemoptysis)
- Abdominal pain
- Decreased urinary output despite adequate fluid intake
- Irritability in infants

Probable

2. Probable Case – (Suspected Case with both Supportive Lab Evidence)

Supportive Lab Evidence:

- Thrombocytopenia
- Leukopenia



Confirmed

3. Confirmed Case – (Probable case with any one of the three Confirmatory Evidence)

Confirmatory evidence of viral infection would therefore, be based on:

- Detection of IgM

OR

- Detection of viral antigen (NS1 antigen in blood)

OR

- Detection of virus by PCR

OR

- Demonstration of ≥ 4 fold rise in IgG antibody titre in paired acute and convalescent serum

Febrile patient
(2-10 days)

Out-patient department

Emergency department

Suspected Case

CBC

Probable case

REPORT

Admit

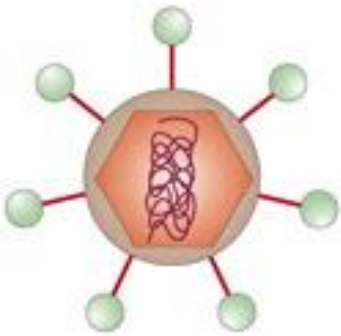
Day 2-5
NS-1 antigen

Day 6-10
IgM

Confirmed case

Direct methods

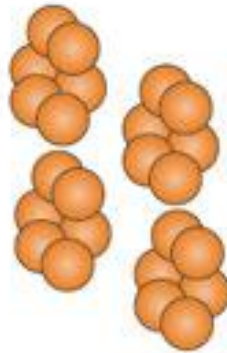
Indirect methods



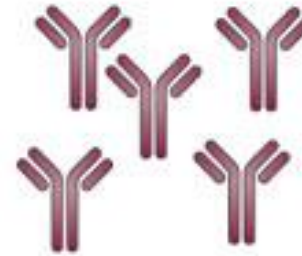
Virus isolation



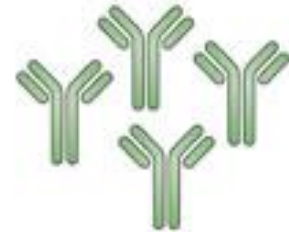
Genome detection



Antigen detection



Serology IgM



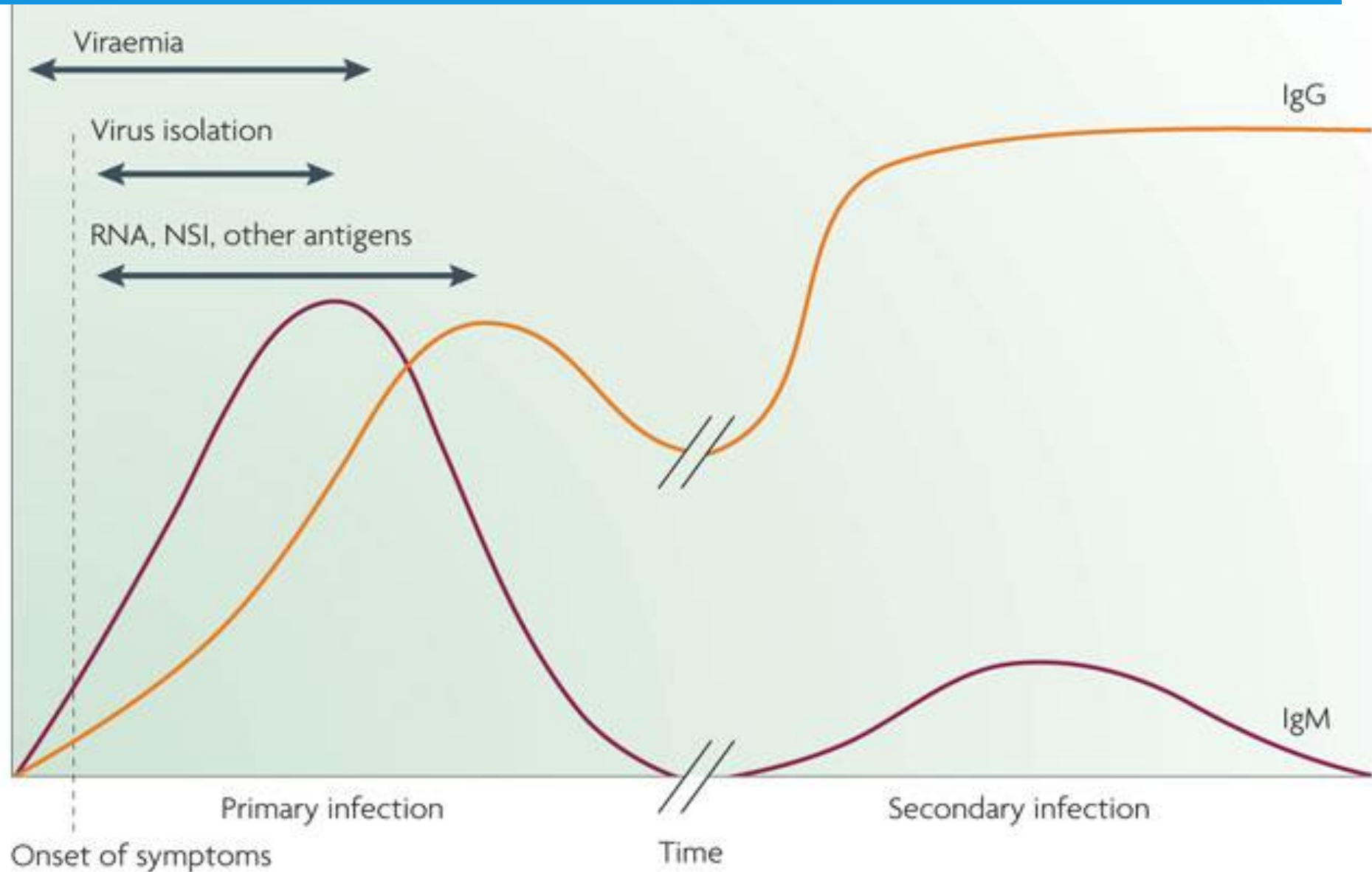
Serology IgG

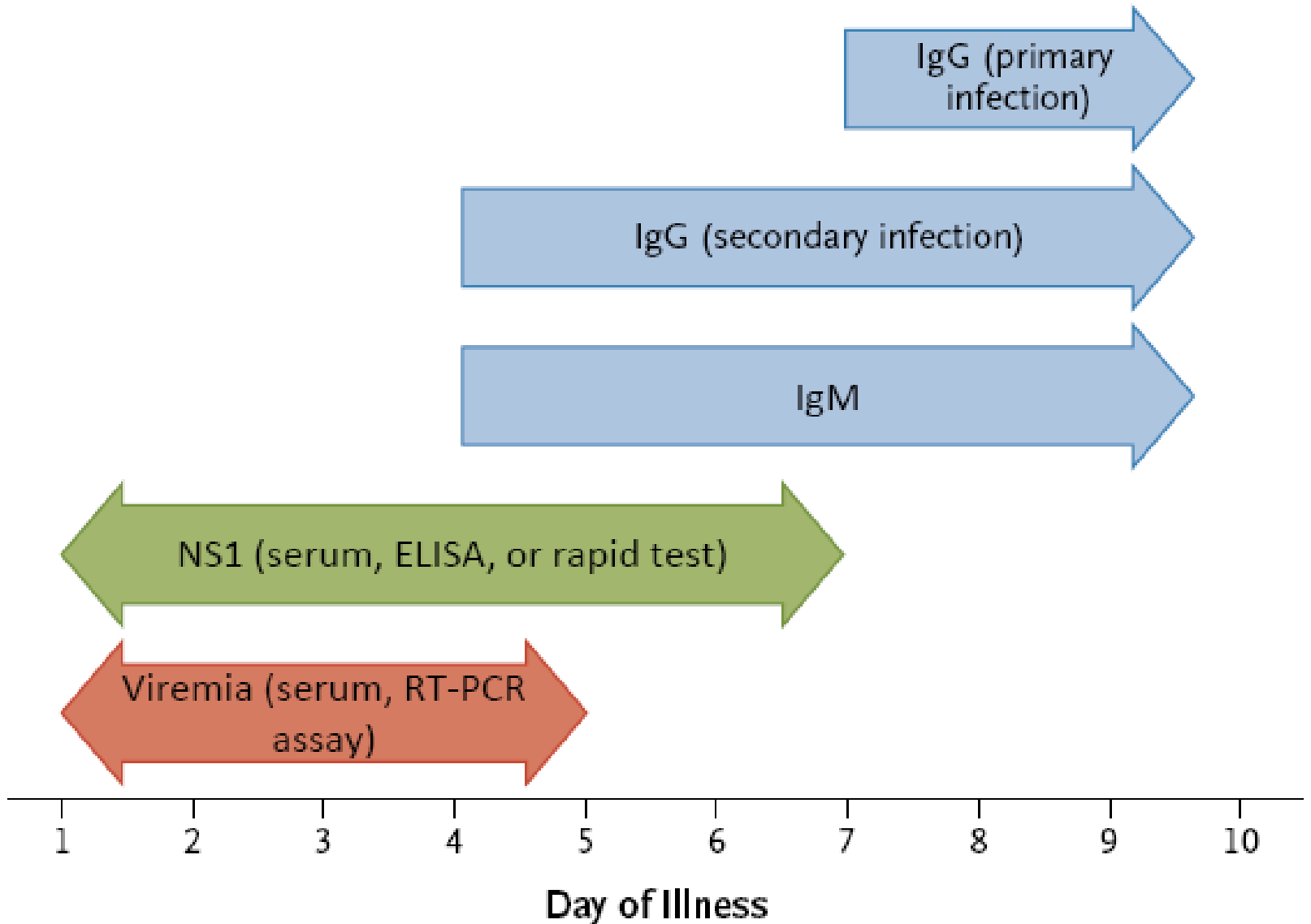


Less than 5 days

More than 5 days

Antibody titre





PROBABLE DENGUE FEVER (2011)

- * An acute febrile illness with **two** or more of the following manifestations:
 - * Headache
 - * Retro-orbital pain
 - * Myalgia
 - * Arthralgia
 - * Rash
 - * Hemorrhagic manifestations
 - * Leukopenia
 - * **Thrombocytopenia (less than 150,000)**
 - * **Rising Hct (5-10%)**

And

- **Supportive Serology** (a reciprocal Hemagglutination-inhibition antibody titer ≥ 1280 , a comparable IgG ELISA titer or a positive IgM antibody test on a late acute or convalescent-phase serum specimen)
- Or
- **Occurrence at same location and time as other confirmed cases of dengue**

DENGUE FEVER/DHF

Differential Diagnosis

* Arboviruses

Chikungunya

* Other viral
Diseases

Measles; rubella and other viral
exanthems; Epstein-Barr Virus,
Enteroviruses, Influenza; hepatitis A,
Hantavirus

* Bacterial diseases

Meningococemia, leptospirosis,
typhoid, melioidosis, rickettsial diseases,
Scarlet fever

* Parasitic diseases

Malaria

CONFIRMED DENGUE FEVER

- * A case confirmed by laboratory criteria

Isolation of Dengue Virus from serum or Autopsy Sample

≥ 4 fold rise in IgG or IgM antibody titres in paired serum samples

Demonstration of Dengue Antigen in autopsy specimen, serum or CSF

Detection of Dengue Virus Genomic Sequence by PCR

REPORTABLE DENGUE FEVER

**Any probable or confirmed case of dengue
should be reported to Health Department
and requires admission to the hospital**

DHF

VS

DF

Febrile
Phase



Critical
Phase



Recovery
Phase

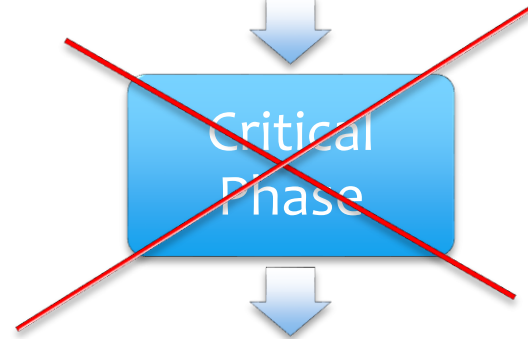
Febrile
Phase



Critical
Phase



Recovery
Phase



CASE DEFINITION FOR DENGUE HEMORRHAGIC FEVER

The following must **ALL** be present:

Fever, or h/o acute fever, lasting 2-7 days, occasionally biphasic

Hemorrhagic tendencies, evidenced by at least one of the following

- A positive tourniquet test
- Petechiae, ecchymoses or purpura
- Bleeding from mucosa, gastrointestinal tract, injection sites, or other locations
- Haemetemesis or malena

Thrombocytopenia ($\leq 100,000$ per mm^3)

Evidence of Plasma Leakage manifested by at least **one** of the following

- A rise in Hct $\geq 20\%$ above average for age, sex and population
- A drop in Hct $\geq 20\%$ after volume-replacement treatment
- Signs of plasma leakage such as pleural effusion, ascites and hypoproteinemia

CASE DEFINITION FOR DENGUE SHOCK SYNDROME

All of the **four** criteria of DHF

plus

evidence of circulatory failure manifested by:

- Rapid and weak pulse, and
- Narrow Pulse Pressure (≤ 20 mmHg)
Or manifested by
- Hypotension for age, and
- Cold, clammy skin and restlessness

EXPANDED DENGUE SYNDROME

Organopathy in the setting
of acute dengue virus infection

- * Liver failure
- * central nervous system (CNS) dysfunction
- * myocardial dysfunction
- * encephalopathy and seizures
- * acute pure motor weakness
- * Mononeuropathies
- * Polyneuropathies
- * Guillain-Barré syndrome
- * transverse myelitis
- * myocarditis

CASE REPORT

Open Access

Expanded dengue syndrome: subacute thyroiditis and intracerebral hemorrhage

Muhammad Zaman Khan Assir^{1*}, Ali Jawa² and Hafiz Ijaz Ahmed³

Abstract

Background: Although most symptomatic dengue infections follow an uncomplicated course, complications and unusual manifestations are increasingly being reported due to rising disease burden. Expanded dengue syndrome is a new entity added into World Health Organization (WHO) classification system to incorporate this wide spectrum of unusual manifestations. We report a case of expanded dengue syndrome with subacute thyroiditis and intracerebral hemorrhage. This is the first case report of thyroiditis in dengue infection.

Case presentation: A 20 years old man presented with fever, myalgias, arthralgias, retro-orbital pain, vomiting and gum bleeding during a large dengue outbreak in Lahore, Pakistan. On 7th day of illness patient became afebrile, but he developed severe headaches, unconsciousness followed by altered behavior. On 9th day of illness patient developed painful neck swelling accompanied by fever, tremors, palpitations, hoarseness of voice and odynophagia. Examination revealed acutely swollen, tender thyroid gland along with features of hyperthyroidism. Laboratory evaluation revealed stable hematocrit, thrombocytopenia and leukopenia. Patient had seroconverted for anti-dengue IgM antibodies on the 10th day of illness. A non-contrast Computed Tomogram (CT) of the brain showed right frontal lobe hematoma. Thyroid profile showed increased free T3 and T4 and low TSH. Technetium thyroid scan showed reduced tracer uptake. He was diagnosed as having subacute thyroiditis and treated with oral prednisolone and propranolol. Follow up CT brain showed resolving hematoma. Patient's recovery was uneventful.

Conclusion: Subacute thyroiditis may develop during the course of dengue fever and should be included as a manifestation of expanded dengue syndrome. It should be suspected in patients with dengue fever who develop painful thyroid swelling and clinical features of hyperthyroidism.

Keywords: Dengue fever, Expanded dengue syndrome, Thyroiditis, Intracerebral Hemorrhage

EXAMINATION

- * Tourniquet test
- * **Pulse** (Bradycardia, Tachycardia in an afebrile patient)
- * Blood Pressure
- * **Pulse Pressure**
- * Temperature
- * **Capillary refill time**

INJECTED PHARYNX



PETECHIAL RASH



SUBMUCOSAL HEMORRHAGE



BRUISING



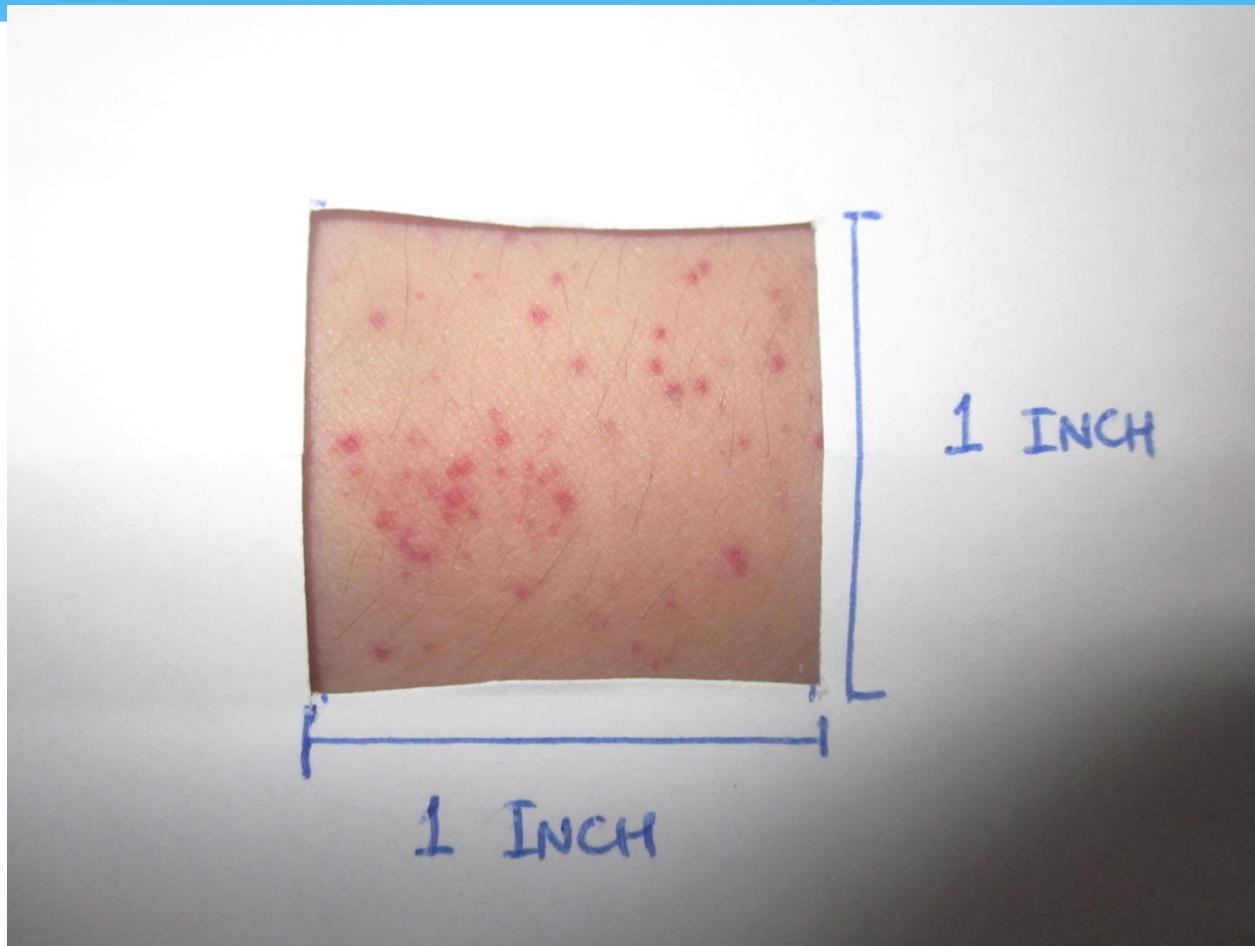
CAPILLARY REFILL TIME



TOURNIQUET TEST



TOURNIQUET TEST



TOURNIQUET TEST

- * Positive TT serves as the **only** indicator of hemorrhagic tendency in grade 1 DHF.
- * The sensitivity of the test varies widely from as low as 0% to 57%, depending on the phase of illness the test was done and how often the test was repeated, if negative.
- * In addition 5-21% of patients with dengue like illness had positive tourniquet test but subsequently have negative dengue serology

Level of Evidence	Reference
Level 1	Badyopadhyay S, Lum LCS, Kroeger A. Classifying dengue: a review of the difficulties in using the WHO case classification for dengue haemorrhagic fever. Tropical Medicine and International Health. 2006; 11(8):1238-55.

TOURNIQUET TEST

- * A recent study demonstrated that there was **95.3%** positive predictive value if fever, positive tourniquet test, leucopenia/ thrombocytopenia/ hemoconcentration were used as screening criteria.
- * Presence of **≥ 10 petechiae per square inch** should be considered positive.

Level of Evidence	Reference
Level 8	Kittigul L, Pitakarnjanakul P, Sujirarat D, et al . The differences of clinical manifestations and laboratory findings in children and adults with dengue virus infection. <i>J Clin Virol.</i> 2007 Jun;39(2):76-81.

TAKE HOME MESSAGE

- * Dengue Fever and DHF could be indistinguishable at the time of presentation
- * All probable and confirmed dengue fever cases need to be admitted and reported to health department
- * Careful attention physical signs and symptoms as well as **appropriate** and **timely** laboratory tests are key to diagnosis



Thank You