Core^{TM} Dengue (IgG+IgM)

Rapid test for IgM & IgG antibodies to Dengue Virus
(Device)

INTRODUCTION

Core Dengue is a rapid immunochromatographic test for the simultaneous detection of IgM and IgG antibodies to Dengue virus in human serum/plasma/whole blood. The test can be used as a screening test for Dengue viral infection and as an aid for differential diagnosis of the self limiting primary Dengue infections and the potentially fatal secondary Dengue infections in conjunction with other criteria.

SUMMARY

Dengue fever virus (serotypes 1-4) belong to the family of Flaviviridae, which is widely distributed in the epidemic and endemic areas throughout tropical and subtropical regions of the world. Dengue virus infection is considered significant in terms of morbidity, mortality and economic cost associated with it an estimated 100 million cases of dengue fever occurring throughout the world yearly. Dengue virus is transmitted in nature principally by the day-biting Aedes aegypti and Aedes albopictus mosquitoes. The mosquito vector is highly domesticated and an urban species. Dengue presents typically as a fever of sudden onset with headache, retroorbital pain, pain in the back and limbs (break-bone fever), lymphadenopathy and maculopaplar rash.Patients diagnosed with dengue infection in endemic areas generally have secondary infection, whereas patients in non-endemic areas are usually diagnosed with primary infection. Specific antibody response to Dengue virus enables serodiagnosis and differentiation between primary and secondary dengue infections and detection of potentially life threatening conditions such as DHF and DSS.

Core Dengue is a new generation rapid Immunochromatographic test using highly specific and purified immunodominant, Recombinant Dengue 'Env.' antigens. It is a simple test for the differential diagnosis of Dengue virus infection.

PRINCIPLE

Core Dengue utilizes the principle of Immunochromatography, a unique two site, self performing immunoassay on a membrane. Specific human IgM and human IgG antibody binding proteins are immobilized on the nitrocellulose membrane as two individual test bands (IgM and IgG) in the test window "T" of the test device at region "M" and region "G" respectively. The IgM band in the test window "T" is closer to the sample well and the IgG band is close to the control window "C". As the test sample flows through the membrane assembly within the test device, the colored–Dengue specific recombinant antigen-colloidal gold conjugate complexes with specific antibodies (IgM and IgG) to Dengue virus, if present in the sample. This complex moves further on the membrane to the test region where it is immobilized by the Specific human IgM antibody and/or human IgG antibody binding proteins coated on the membrane leading to formation of a colored band which confirms a positive test result. Absence of these colored bands in the test window "T" indicates a negative test result. A built-in control band in the control window "C" appears when the test has been performed correctly, regardless of the presence or absence of anti-Dengue virus antibodies in the specimen and serves to validate the test performance.

REAGENTS AND MATERIALS SUPPLIED

Each kit contains:

A.Individual pouches, each containing:

1.Core Dengue (Device): Membrane test assembly predispensed with recombinant Dengue virus specific antigen colloidal gold conjugate, streptavidin gold conjugate, anti human IgM at test region 'M' Protein A at the test region 'G' and Biotin at the control region 'C'.

2. Desiccant pouch

3. Sample loop

B. Sample Running Buffer

C. Package Insert

STORAGE AND STABILITY

The sealed pouches in the test kit & the kit components may be stored between 4-30°C for the duration of the shelf life as indicated on the pouch.

NOTE

1. For in vitro diagnostic use only. NOT FOR MEDICINAL USE.
2. Do not use beyond expiry date.
3. Read the instructions carefully before performing the test.
4. Handle all specimen as potentially infectious
5. Follow standard biosafety guidelines for handling and disposal of potentially infective material.

SPECIMEN COLLECTION AND PREPARATION

1. No special preparation of the patient is necessary prior to specimen collection by approved techniques.
2. Though fresh serum/plasma is preferable, specimen may be stored at 2-8 °C for upto 24 hours, in case of delay in testing.
3. Whole blood samples collected with a suitable anticoagulant such as EDTA or Heparin or Oxalate can also be used.
4. Do not use turbid,lipaemic, icteric and haemolysed specimen.
5. Repeated freezing, thawing of the specimen should be avoided.
6. Specimen containing precipitates or particulate matter must be centrifuged and the clear supernatant only should be used for testing.

TESTING PROCEDURE AND INTERPRETATION OF RESULTS

1. Bring the kit components to room temperature before testing.
2. Open the pouch and retrieve the test device. Once opened, the device must be used immediately.
3. Label the test device with patient identity.
4. Add 5μl of serum/ plasma or whole blood with a micropipette into the sample port "A", OR using the 5μl sample loop provided with the kit. Dip the loop into the sample and then blot into the sample port 'A'.. Ensure that the loop does not retrieve clots or debris from the sample.
5. Add 5 drops of sample running buffer to the reagent port "B".
6. At the end of 15 minutes read the results as follows.

Interpretation of Results

Negative Result:

The presence of only the single red/purple coloured band in the control window "C" indicates the absence of specific antibodies against Dengue virus or that the amount of antibodies is below the detection limit of the test.

Positive Test Result:

1) In addition to the band in the control window 'C', appearance of two red/purple coloured bands in the test window at region 'M' and region 'G' indicates the presence of Dengue virus specific IgM and IgG antibodies. (Acute secondary infection)
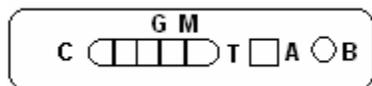
2) In addition to the control band in the control window 'C', appearance of a red/purple coloured band in the test window at region 'M' indicates the presence of Dengue virus specific IgM antibodies. (Acute primary infection)
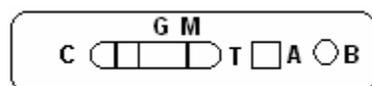
3) In addition to the control band in the control window 'C', the appearance of a red/purple coloured band in the test window at region 'G' indicates the presence of Dengue virus specific IgG antibodies. (Acute secondary infection)

Invalid Result:If after 15 minutes no band is visible either in the test or control window , the result is considered invalid. The test should be re run with a new device.

Performance Characteristics

1.In an in-house evaluation, fifty known positive and one hundred and ten known negative specimen were tested with Core Dengue and compared with a licensed commercially available ELISA test. The results obtained are as follows:

Specimen Type	No. of Specimens Tested	LicensedTest	Core Dengue
Negative for Ab. to Dengue	110	110	110
Positive for Ab. to Dengue	50	50	50

Based on the above study the specificity and sensitivity of Core Dengue is 100%

2. 25 samples were evaluated in an external study comprising of primary, secondary and negative Dengue sera, along with Japanese Encephelitis sera (JE) in parallel with Dengue IgM/ IgG Elisa and JE Elisa. Core Dengue gave concordant results with all the samples with no cross reactivity with JE positive sera.

Remarks

1.   Do not use test kit beyond expiration date.
2.   While sample should be collected as soon as possible after onset of illness, it is recommended that follow up of testing should be done on day   10 after the first sample to allow seroconversion, especially when the test is negative and Dengue virus infection is clinically suspected.
3.   Though Core Dengue does provide evidence to distinguish the past (secondary) infection from current (primary) ongoing infection, a   negative result does not preclude the possibility of infection with Dengue virus.
4.   As with all diagnostic tests, a definitive clinical diagnosis should not be based on the results of a single test but should rather be made by a   clinician after all clinical findings have been evaluated.
5.   DHF is primarily the disease of children under 15 years in hyper endemic areas. Impending DSS symptoms include suspected abdominal   pain, persistent vomitting, change in the level of conciousness, hypothermia and sudden decrease in platelet counts.
6.   80% of the patients may have detectable levels of IgM antibody by day 5 of illness and 99% by day 10.
7.   IgM levels rise quickly and peak by two weeks after onset of symptoms and then fall to become undetecable over 2-3 months. IgG antibodies rise quickly and peak at about two weeks post infection and then decline slowly over 3-6 months.

Bibliography
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