MAYO CLINIC LABORATORIES

Test Definition: EBVE

Epstein-Barr Virus (EBV), IgG Antibody to Early Antigen, Serum

Overview

Useful For

A third-order test in the diagnosis of infectious mononucleosis, especially in situations when initial testing results (heterophile antibody test) are negative and follow-up testing (viral capsid antigen: VCA IgG, VCA IgM, and Epstein-Barr nuclear antigen) yields inconclusive results

Aiding in the diagnosis of type 2 or type 3 nasopharyngeal carcinoma (NPC)

This test is **not useful for** screening patients for NPC.

Method Name

Multiplex Flow Immunoassay

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL

Forms

If not ordering electronically, complete, print, and send Infectious Disease Serology Test Request (T916) with the specimen.

Specimen Minimum Volume

0.4 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject

Heat-activated specimen	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	14 days	
	Frozen	14 days	

Clinical & Interpretive

Clinical Information

Epstein-Barr virus (EBV), a member of the herpesvirus group, is the etiologic agent of infectious mononucleosis. EBV infections are difficult to diagnose in the laboratory since the virus does not grow in standard cell cultures. The majority of infections can be identified, by testing the patient's serum for heterophile antibodies (rapid latex slide agglutination test, eg, MONOS / Infectious Mononucleosis, Rapid Test, Serum). Heterophile antibodies usually appear within the first 3 weeks of illness but decline rapidly within a few weeks. However, this heterophile antibody fails to develop in about 10% of adults, more frequently in children, and almost uniformly in infants with primary EBV infections. Most of these heterophile antibody negative cases of infectious mononucleosis-like infections are due to cytomegalovirus, but in one series of 43 cases, EBV was the cause in 7. In cases where EBV is suspected but the heterophile antibody is not detected, an evaluation of EBV-specific antibodies (eg, IgM and IgG antibodies to EBV viral capsid antigen [VCA]) and antibodies to EBV nuclear antigen (EBNA) may be useful. The EBV enzyme immunoassays that detect antibodies to the EBV VCA and early antigen (EA) are more sensitive than heterophile antibody tests.

Infection with EBV usually occurs early in life. For several weeks to months after acute onset of the infection, it is spread by upper respiratory secretions that contain the virus. Among the clinical disorders due to EBV infection, infectious mononucleosis is the most common. Other disorders due to EBV infection include African-type Burkitt lymphoma and nasopharyngeal carcinoma (NPC). EBV infection may also cause lymphoproliferative syndromes, especially in patients with AIDS and in patients who have undergone kidney or bone marrow transplantation.

Using immunofluorescent staining techniques, 2 patterns of EA are seen: diffuse staining of both cytoplasm and nucleus (early antigen-diffuse: EA-D) and cytoplasmic or early antigen restricted (EA-R). Antibodies responsible for the diffuse staining pattern are seen in infectious mononucleosis and NPC and are measured in this assay.

Reference Values

Negative
Reference values apply to all ages.

Interpretation

Generally, this antibody can only be detected during active Epstein-Barr virus (EBV) infection, such as in patients with infectious mononucleosis. Clinical studies have indicated that patients who have chronic active or reactivated EBV infection commonly have elevated levels of IgG-class antibodies to the early antigen (EA) of EBV.

IgG antibody specific for the diffuse early antigen of EBV is often found in patients with nasopharyngeal carcinoma

(NPC). Of patients with type 2 or 3 NPC (World Health Organization classification), 94% and 83% respectively, have positive-antibody responses to EA. Only 35% of patients with type 1 NPC have a positive response. The specificity of the test is such that 82% to 91% of healthy blood donor controls and patients who do not have NPC have negative responses (9%-18% false-positive results). Although this level of specificity is useful for diagnostic purposes, the false-positive rate indicates that the test is not useful for NPC screening.

Cautions

This test detects the diffuse components of early antigen only.

Clinical Reference

1. Fields BN, Knipe DM: Epstein-Barr virus. In: Fields BN, Knipe DM, Howley PM, eds. Fields Virology. 4th ed. Lippincott Williams and Wilkins; 2001

2. Lennette ET: Epstein-Barr virus. In: Murray PR, Baron EJ, Pfaller MA, et al, eds. Manual of Clinical Microbiology. 6th ed. ASM Press; 1995:905-910

3. Fugl A, Andersen CL: Epstein-Barr virus and its association with disease - a review of relevance to general practice. BMC Fam Pract. 2019 May 14;20(1):62. doi: 10.1186/s12875-019-0954-3

Performance

Method Description

Testing is performed on the BioPlex 2200 System for the detection of the early antigen-diffuse (EA-D) antibody. An aliquot of the patient serum, sample diluent, and bead reagent are combined in a reaction vessel. After washing, antihuman-IgG antibody conjugated to phycoerythrin (PE) is added to the beads and incubated. Another wash step removes excess conjugate, and beads are subsequently resuspended in wash buffer. The bead mixture passes through a detector where the identity of each bead is determined by the bead's dye fluorescence. In addition, the amount of antibody captured by the antigen is measured by the fluorescence of the bound PE.(Package insert: BioPlex 2200 System EBV EA-D. Bio-Rad Laboratories; 03/2012)

PDF Report

No

Day(s) Performed

Monday through Saturday

Report Available

Same day/1 to 3 days

Specimen Retention Time

2 weeks

Performing Laboratory Location

Rochester

Fees & Codes

Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact Customer Service.

Test Classification

This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

86663

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
EBVE	EBV EA IgG Ab, S	22295-0

Result ID	Test Result Name	Result LOINC® Value
EBVE	EBV EA IgG Ab, S	22295-0