MAYO CLINIC LABORATORIES

Test Definition: CASF

IgG/Albumin Ratio, Spinal Fluid

Overview

Useful For
Assessment of cerebrospinal fluid (CSF) IgG/albumin ratio in the absence of a paired CSF and serum specimen

Method Name
Nephelometry

NY State Available
Yes

Specimen

Specimen Type
CSF

Ordering Guidance
The cerebrospinal fluid (CSF) index in which the CSF IgG/albumin ratio is compared to the serum IgG/albumin ratio aids in the diagnosis of individuals with multiple sclerosis. See SFIG / Cerebrospinal Fluid IgG Index Profile, Serum and Spinal Fluid.

Specimen Required
Specimen Type: Spinal fluid (CSF)
Container/Tube: Sterile vial
Specimen Volume: 1 mL
Collection Instructions:
1. Submit CSF from collection vial number 2 (preferred, not required).
2. Label specimen as CSF.

Specimen Minimum Volume
0.5 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
CSF	Refrigerated (preferred)	28 days	
	Ambient	14 days	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information

Elevation of IgG levels in the cerebrospinal fluid (CSF) of patients with inflammatory diseases of the central nervous system (CNS) (multiple sclerosis [MS], neurosyphilis, acute inflammatory polyradiculoneuropathy, subacute sclerosing panencephalitis) is due to local (intrathecal) CNS synthesis of IgG.

The 2 most commonly used diagnostic laboratory tests for MS are CSF index and oligoclonal banding. The CSF index is the CSF IgG to CSF albumin ratio compared to the serum IgG to serum albumin ratio. The CSF index is therefore an indicator of the relative amount of CSF IgG compared to serum, and any increase in the index is a reflection of IgG production in the CNS. The IgG synthesis rate is a mathematical manipulation of the CSF index data and can also be used as a marker for CNS inflammatory diseases.

Reference Values

CSF IgG: 0.0-8.1 mg/dL
CSF albumin: 0.0-27.0 mg/dL
CSF IgG/albumin: 0.00-0.21

Interpretation

Cerebrospinal fluid IgG index is positive (elevated) in approximately 80% of patients with multiple sclerosis.

Cautions

The cerebrospinal fluid (CSF) index can be elevated in other inflammatory demyelinating diseases such as neurosyphillis, acute inflammatory polyradiculoneuropathy, and subacute sclerosing panencephalitis. Oligoclonal banding in CSF is slightly more sensitive (85%) than the CSF index. The use of CSF index plus oligoclonal banding has been reported to increase the sensitivity to over 90%.

Clinical Reference

1. Tourtellotte WW, Walsh MJ, Baumhefner RW, Staugaitis SM, Shapshak P. The current status of multiple sclerosis intra-blood-brain-barrier IgG synthesis. Ann NY Acad Sci. 1984;436:52-67
2. Bloomer LC, Bray PF. Relative value of three laboratory methods in the diagnosis of multiple sclerosis. Clin Chem. 1981;27(12):2011-2013
3. Hische EA, van der Helm HJ. Rate of synthesis of IgG within the blood-brain barrier and the IgG index compared in the diagnosis of multiple sclerosis. Clin Chem. 1987;33(1):113-114
4. Swanson JW. Multiple sclerosis: update in diagnosis and review of prognostic factors. Mayo Clin Proc. 1989;64(5):577-586
5. Markowitz H, Kokmen E. Neurologic diseases and the cerebrospinal fluid immunoglobulin profile. Mayo Clin Proc. 1983;58(4):273-274
6. Thompson AJ, Banwell BL, Barkhof F, et al. Diagnosis of multiple sclerosis: 2017 revisions of the McDonald criteria. Lancet Neurol. 2018;17(2):162-73. doi:10.1016/S1474-4422(17)30470-2

7. Gurtner KM, Shosha E, Bryant SC, et al. CSF free light chain identification of demyelinating disease: comparison with oligoclonal banding and other CSF indexes. Clin Chem Lab Med. 2018;56(7):1071-1080. doi:10.1515/cclm-2017-0901
8. Rifai N, Horvath AR, Wittwer CT, eds: Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2018

Performance

Method Description

The cerebrospinal fluid (CSF) IgG and albumin are determined by immunonephelometry on a Siemens Nephelometer II. In this assay, the light scattered by the antigen-antibody complexes are measured. The intensity of the measured scattered light is proportional to the amount of antigen-antibody complexes in the sample under certain conditions. If the antibody volume is kept constant, the signal behaves proportionally to the antigen volume. A reference curve is generated by a standard with a known antigen content on which the scattered light signals of the samples can be evaluated and calculated as an antigen concentration.

Antigen-antibody complexes are formed when a sample containing antigen, and the corresponding antiserum are put into a cuvette. A light beam is generated with a light emitting diode, which is transmitted through the cuvette. The light is scattered by the immuno-complexes that are present. Antigen and antibody are mixed in the initial measurement, but no complex is yet formed. An antigen-antibody complex is formed in the final measurement.

The result is calculated by subtracting the value of the final measurement from the initial measurement. The distribution of intensity of the scattered light depends on the ratio of the particle size of the antigen-antibody complexes to the radiated wavelength. CSF IgG and albumin, and CSF IgG/albumin ratios are reported.(Instruction manual: Siemens Nephelometer II Operations. Siemens, Inc; Version 2.4, 07/2019; Addendum to the Instruction Manual 2.3, 08/2017)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

1 to 3 days

Specimen Retention Time

2 weeks

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Superior Drive

Fees & Codes

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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 account representative. 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

82042
82784

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CASF	IgG/Albumin Ratio, CSF	2470-3

Result ID	Test Result Name	Result LOINC® Value
IGG_C	IgG, CSF	2464-6
ALB_C	Albumin, CSF	1746-7
AIGAC	IgG/Albumin, CSF	2470-3