Test Definition: B2MC

Beta-2-Microglobulin (Beta-2-M), Spinal Fluid

Overview

Useful For
Evaluation of central nervous system inflammation and B-cell proliferative diseases

Method Name
Nephelometry

NY State Available
Yes

Specimen

Specimen Type
CSF

Specimen Required
Container/Tube: Sterile vial
Specimen Volume: 1 mL
Collection Instructions: Send spinal fluid from collection vial 1.

Specimen Minimum Volume
0.5 mL

Reject Due To

Gross hemolysis	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
Beta-2-microglobulin (beta-2-M) is a small membrane protein (11,800 Da) associated with the heavy chains of class I

major histocompatibility complex proteins and is, therefore, on the surface of all nucleated cells. The small size allows beta-2-M to pass through the glomerular membrane, but it is almost completely reabsorbed in the proximal tubules.

Increased beta-2-M levels in the cerebrospinal fluid (CSF) have been shown to be of diagnostic use in non-Hodgkin lymphoma with central nervous system involvement. Elevated CSF:serum ratios seen in patients with aseptic meningoencephalitis suggest the possibility of neurologic processes including those associated with HIV infection and acute lymphoblastic leukemia. Beta-2-M measurement in multiple sclerosis seems to be of indeterminate usefulness.

Reference Values

0.70-1.80 mcg/mL

Interpretation

Elevations of cerebrospinal fluid beta-2-microgobulin levels may be seen in a number of diseases including malignancies, autoimmune disease, and neurological disorders.

Cautions

Results determined by assays using different manufacturers or methods may not be comparable.

Clinical Reference

1. Koch TR, Lichtenfeld KM, Wiernik PH. Detection of central nervous system metastasis with cerebrospinal fluid beta-2-microglobulin. Cancer. 1983;52(1):101-104
2. Mavligit GM, Stuckey SE, Cabanillas FF, et al. Diagnosis of leukemia or lymphoma in the central nervous system by beta-2-microglobulin determination. N Engl J Med. 1980;303(13):718-722
3. Jeffery GM, Frampton CM, Legge HM, Hart DN. Cerebrospinal fluid beta 2-microglobulin levels in meningeal involvement by malignancy. Pathology. 1990;22(1):20-23
4. Us O, Lolli F, Baig S, Link H. Intrathecal synthesis of beta-2-microglobulin in multiple sclerosis and aseptic meningo-encephalitis. Acta Neurol Scand. 1989;80(6):598-602
5. Elovaara I, Livanainen M, Poutianen E, et al. CSF and serum beta-2-microglobulin in HIV infection related to neurological dysfunction. Acta Neurol Scand. 1989;79(2):81-87
6. Dolan MJ, Lucey DR, Hendrix CW, Melcher GP, Spencer GA, Boswell RN. Early markers of HIV infection and subclinical disease progression. Vaccine. 1993;11(5):548-551
7. Brew BJ, Bhalla RB, Fleisher M, et al. Cerebrospinal fluid beta 2 microglobulin in patients infected with human immunodeficiency virus. Neurology. 1989;39(6):830-834
8. Musto P, Tomasi P, Cascavilla N, et al. Significance and limits of cerebrospinal fluid beta-2-microglobulin measurement in course of acute lymphoblastic leukemia. Am J Hematol. 1988;28(4):213-218
9. Lucey DR, McGuire SA, Clerici M, et al. Comparison of spinal fluid beta 2-microglobulin levels with $CD4^+$ T cell count, in vitro T helper cell function, and spinal fluid IgG parameters in 163 neurologically normal adults infected with the human immunodeficiency virus type l. J Infect Dis. 1991;163(5):971-975
10. Bjerrum OW, Bach FW, Zeeberg I. Increased level of cerebrospinal fluid beta 2-microglobulin is related to neurologic impairment in multiple sclerosis. Acta Neurol Scand. 1988;78(1):72-75
11. Dietzen DJ, Willrich MAV. Amino acids, peptides, and proteins. In: Rifai N, Chiu RWK, Young I, Burnham CAD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:chap 31

Performance

Method Description

In this Siemens Nephelometer II method, the light scattered onto the antigen-antibody complexes is 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 onto the immuno-complexes that are present. Antigen and antibody are mixed in the initial measurement, but no complex is formed yet. 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.(Instruction manual: Siemens Nephelometer II. Siemens, Inc.; Version 4, 07/2019)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

1 to 3 days

Specimen Retention Time

14 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Superior Drive

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 account representative. For assistance, contact Customer Service.

Test Classification

This test has been modified from the manufacturer's instructions. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

82232

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LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
B2MC	Beta-2-Microglobulin, CSF	1951-3

Result ID	Test Result Name	Result LOINC® Value
B2MC	Beta-2-Microglobulin, CSF	1951-3