Test Definition: VEGF

Vascular Endothelial Growth Factor, Plasma

Overview

Useful For

Evaluation of patients with suspected POEMS (polyneuropathy, organomegaly, endocrinopathy, monoclonal gammopathy, and skin changes) syndrome, particularly in differentiating from other forms of polyneuropathy and/or monoclonal plasma cell disorders

Special Instructions

- Acquired Neuropathy Diagnostic Algorithm

Method Name

Electrochemiluminescence Immunoassay (ECLIA)

NY State Available

Yes

Specimen

Specimen Type

Plasma EDTA

Specimen Required

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube: Lavender-top (EDTA)
Submission Container/Tube: Plastic vial
Specimen Volume: 0.5 mL
Collection Instructions:
1. Immediately after specimen collection, place the tube on wet ice.
2. Centrifuge at 4 degrees C, 1500 x *g* for 10 minutes.
3. Aliquot plasma into plastic vial.
4. Within 2 hours of collection, freeze specimen.

Specimen Minimum Volume

0.3 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	Reject
Gross icterus	Reject

Heat-treated	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Plasma EDTA	Frozen (preferred)	21 days	
	Refrigerated	24 hours	

Clinical & Interpretive

Clinical Information

Vascular endothelial growth factor (VEGF) is a critical modulator of angiogenesis (the growth of new blood vessels).(1) In mammals, there are 5 members of the VEGF family, each arising from different genes, with VEGF-A being the most well-studied. VEGF-A promotes angiogenesis by inducing migration of endothelial cells, promoting mitosis of endothelial cells, and upregulating matrix metalloproteinase activity.(2) VEGF-A is regulated by hypoxia, with increased expression when cells detect an environment low in oxygen. Physiologically, VEGF induces new blood vessel formation during embryonic development, after tissue injury, and in response to blocked vessels.

VEGF also regulates pathological vessel formation, such as in tumor growth and metastases.(3) Angiogenesis during tumor development is complex, although it is clear that VEGF plays a key role. VEGF also regulates angiogenesis in other disease states including rheumatoid arthritis, osteoarthritis, diabetes, and age-related macular degeneration. In addition, circulating concentrations of VEGF are elevated in patients with polyneuropathy, organomegaly, endocrinopathy, monoclonal gammopathy, and skin changes (POEMS) syndrome, a monoclonal plasma cell disorder.(4) Although the pathologic role of VEGF in POEMS is unclear, it is useful as a diagnostic marker and for assessing response to therapy.

In addition to the various genes in the VEGF family, VEGFA has multiple splicing variants. VEGFA 165 is the predominant isoform.(2) An internal study has demonstrated that the VEGF assay used by Mayo Clinic Laboratories is specific for the splice variant of VEGF-A 165 and does not detect other isoforms of VEGFA or other VEGF gene products.

For more information see Acquired Neuropathy Diagnostic Algorithm.

Reference Values

< or =96.2 pg/mL

Interpretation

Elevated concentration of vascular endothelial growth factor (VEGF) may be consistent with a diagnosis of POEMS (polyneuropathy, organomegaly, endocrinopathy, monoclonal gammopathy, and skin changes) syndrome.

Decreasing concentrations of VEGF over time in a patient with POEMS syndrome may be consistent with a therapeutic response.

Cautions

Elevated circulating concentrations of vascular endothelial growth factor (VEGF) may be observed in a variety of disease

states, especially those associated with angiogenesis. Elevated concentrations of VEGF must be interpreted within the clinical context of the patient.

Normal concentrations of VEGF do not exclude the diagnosis of POEMS (polyneuropathy, organomegaly, endocrinopathy, monoclonal gammopathy, and skin changes) syndrome.

VEGF has limited stability. Following centrifugation, plasma must be either immediately frozen or refrigerated. Samples can only be stored at refrigerated temperatures for 24 hours, after which time samples must be frozen. Storage of plasma for any length of time at room temperature is not acceptable.

The presence of bevacizumab in patient serum interferes with detection of VEGF. Caution should be taken while interpreting results of patients receiving bevacizumab therapy.

Clinical Reference

1. Apte RS, Chen DS, Ferrara N. VEGF in signaling and disease: Beyond discovery and development. Cell. 2019;176(6):1248-1264
2. Otrock ZK, Makarem JA, Shamseddine AI. Vascular endothelial growth factor family of ligands and receptors: review. Blood Cells Mol Dis. 2007;38(3):258-268
3. Siveen KS, Prabhu K, Krishnankutty R, et al. Vascular endothelial growth factor (VEGF) signaling in tumour vascularization: Potential and challenges. Curr Vasc Pharmacol. 2017;15(4):339-351
4. Brown R, Ginsberg L. POEMS syndrome: clinical update. J Neurol. 2019;266(1):268-277

Performance

Method Description

Testing for vascular endothelial growth factor is performed using an electrochemiluminescence immunoassay.(Unpublished Mayo method).

PDF Report

No

Day(s) Performed

Tuesday, Thursday

Report Available

2 to 7 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 was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

83520

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
VEGF	Vascular Endothelial Growth Fctr, P	34694-0

Result ID	Test Result Name	Result LOINC® Value
63019	VEGF, P	34694-0