Apolipoprotein A-1 in Serum

Background Information

Apolipoprotein A-1 (Apo A1) is the major protein component of high density lipoprotein (HDL) in plasma, and its concentration reflects the amount of HDL present in the sample. Apo A1 recycles cholesterol from the tissues back to the liver for further processing. Apo A1 is a cofactor for lecithin-cholesterol acyltransferase (LCAT), which is responsible for the formation of most plasma cholesteryl esters. Apo A-1 may also have an anti-clotting effect because it can stabilize prostacyclin. Defects in the gene encoding Apo A1 are associated with HDL deficiencies and systemic non-neuropathic amyloidosis. Decreases in concentration of Apo A1 in blood are associated with increased risk for coronary artery disease. However, other conditions such as severe malnutrition, uncontrolled diabetes, chronic renal failure and drugs (androgens, beta blockers, diuretics, etc.) may also cause decreasing concentrations of Apo A1. Recent scientific research showed that measurement of apolipoproteins may be better indicators of the total number of atherogenic particles versus measuring HDL, low-density lipoprotein (LDL) and very-low-density lipoprotein (VLDL).

Clinical Indications

Apo A1 may be measured when patients have a personal or family history of dyslipidemia (hyperlipidemia) and/or premature cardiac vascular diseases (CVD). If patients have recurrent CV events despite adequate risk factor treatment, or a strong family history of coronary heart disease, measurement of Apo A1 may help physicians to find and target the cause. Measurement of Apo A1 can be used to determine if patients have deficiency in Apo A1 causing dyslipidemia, and to monitor effectiveness from lipid-lowering treatment or lifestyle changes, such as decreased dietary fat and increased regular exercise. An Apo A1 assay may be ordered along with an Apolipoprotein B (Apo B) to determine an Apo A1/Apo B ratio, which is sometimes used as an alternative to a total cholesterol/HDL ratio to evaluate risk for developing cardiovascular disease.

Methodology

Apo A1 along with Apo B is measured by using immune nephelometric method. The assays are performed on Beckman Coulter IMMAGE 800 Immunochemistry System. Antibody to human apolipoprotein is mixed with antigen in a sample. The increase in light scatter resulting from the antigen-antibody reaction is converted to a peak rate signal, which is a function of the concentration of antigen in the sample. Following calibration, the peak rate signal for a particular assay is automatically converted to concentration units by the analyzer.

References

1. IMMAGE 800 Immunochemistry System Operations Manual, Instructions #A11403, March 2004. Beckman Coulter Instruments, Inc., Fullerton, CA. 92834-3100.
2. Beckman Coulter IMMAGE 800 Immunochemistry System Chemistry Information Manual, Beckman Coulter Instructions #962248, March 2000, Beckman Coulter Instruments, Inc., Fullerton, CA 92834-3100.
3. National Committee for Clinic Laboratory Standards, Procedures for the Handling and Processing of Blood Specimens, Approved Guideline, NCCLS publication H18-A, Villanova, PA (1990).
4. Walldius G, Jungner I. Rationale for using apolipoprotein B and apolipoprotein A-I as indicators of cardiac risk and as targets for lipid-lowering therapy. *Eur Heart J*. 2005;26(3):210.
5. Mora S, Buring JE, Ridker PM, Cui Y. Association of high-density lipoprotein cholesterol with incident cardiovascular events in women, by low-density lipoprotein cholesterol and apolipoprotein B100 levels: a cohort study. *Ann Intern Med*. 2011.6;155:742-50.

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Test Overview

Test Name	Apolipoprotein A-1
Includes	Apolipoprotein A-1
Methodology	Nephelometry/Beckman Coulter IMMAGE 800
Specimen Requirements	Volume/Size: 1 mL; Type: Serum; Tube/Container: SST (Gold); Transport Temperature: Refrigerated
Minimum Specimen Requirements	Volume/Size: 0.2 mL
Special Information	Patients should not be drawn for at least three months following surgery or myocardial infarction. Certain drugs, unstable weight or eccentric or imbalanced dietary habits may affect results. Patient preparation: 12-hour fast prior to collection.
Clinical Information	Assessment of coronary heart disease risk; Classification of hyperlipidemia
Reference Ranges	**Apolipoprotein A-1** *Male, Age 20 – 99 Years* - Low Risk: >123 mg/dL - Borderline/High Risk: 109 – 123 mg/dL - High Risk: <109 mg/dL *Female, Age 20 – 99 Years* - Low Risk: >140 mg/dL - Borderline/High Risk: 123 – 140 mg/dL - High Risk: < 123 mg/dL
Billing Code	32117
CPT Code	82172

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