MAYO CLINIC LABORATORIES

Test Definition: CHLE

Cholesteryl Esters, Serum

Overview

Useful For

Establishing a diagnosis of lecithin-cholesterol acyltransferase deficiency

Evaluating the extent of metabolic disturbance by bile stasis or liver disease

Method Name

Enzymatic Colorimetric

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

Collection Instructions: Centrifuge and aliquot serum into plastic vial. Send refrigerated.

Forms

If not ordering electronically, complete, print, and send a Cardiovascular Test Request Form (T724) with the specimen.

Specimen Minimum Volume

0.5 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	OK
Gross icterus	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Ambient	24 hours	
	Refrigerated (preferred)	7 days	
	Frozen	60 days	

Clinical & Interpretive

Clinical Information

Cholesterol in the blood serum is normally 60% to 80% esterified with fatty acids, largely as a result of the action of the enzyme lecithin-cholesterol acyltransferase (LCAT), which circulates in the blood in association with the high-density lipoproteins.

Familial deficiency of LCAT is uncommon, usually occurring in individuals of northern European descent, and is associated with erythrocyte abnormalities (target cells) and decreased (20% or less) esterification of serum cholesterol. LCAT deficiency is associated with early atherosclerosis, corneal opacification, hyperlipidemia, and mild hemolytic anemia. In persons who are deficient in LCAT, a much smaller percentage of the serum cholesterol is esterified. Persons who have a familial deficiency of LCAT have only 20% or less of serum cholesterol esterified. In association with a deficiency of LCAT, the concentration of unesterified cholesterol in the serum may increase 2 to 5 times the normal value and the concentration of lecithin may also increase.

Persons with liver disease may have impaired formation of LCAT and, therefore an acquired LCAT deficiency and reduced cholesterol ester.

Reference Values

> or =18 years: 60-80% of total cholesterol
Reference values have not been established for patients who are less than 18 years of age.

Interpretation

Persons who have a familial deficiency of lecithin-cholesterol acyltransferase have only 20% or less of serum cholesterol esterified.

Cautions

Cholesteryl ester storage disease exists as a severe form that is fatal before the age of 1 year (Wolman's disease) and as a subtle form that in some cases has been undetected until adulthood. This disease is caused by a deficiency of a lysosomal enzyme, acid cholesteryl ester hydrolase (also known as acid lipase). Its deficiency causes accumulation of cholesteryl esters in tissues, but it has no effect on the percentage of esterified cholesterol that circulates in the blood serum. Detection of the defect requires careful evaluation of the cholesteryl ester hydrolase activity and cholesteryl ester content of leukocytes, cultured fibroblasts, and liver biopsy specimens.

Clinical Reference

1. Meikle PJ, Mundra PA, Wong G, et al. Circulating lipids are associated with alcoholic liver cirrhosis and represent potential biomarkers for risk assessment. PLoS One. 2015;10(6):e0130346. doi:10.1371/journal.pone.0130346
2. Leach NV, Dronca E, Vesa SC, et al. Serum homocysteine levels, oxidative stress and cardiovascular risk in non-alcoholic steatohepatitis. Eur J Intern Med. 2014;25(8):762-767. doi:10.1016/j.ejim.2014.09.007
3. Santamarina-Fojo S, Hoeg JM, Assmann G, Brewer B. Lecithin cholesterol acyltransferase deficiency and fish eye

disease. In: Valle DL, Antonarakis S, Ballabio A, Beaudet AL, Mitchell GA. eds. The Online Metabolic and Molecular Bases of Inherited Disease. McGraw-Hill; 2019. Accessed June 8, 2021. Available at https://ommbid.mhmedical.com/content.aspx?sectionid=225539713&bookid=2709

Performance

Method Description
Free cholesterol reacts with cholesterol oxidase to generate hydrogen peroxide which reacts with 3,5-dimethoxy-*N*-(2-hydroxy-3-sulfopropyl) aniline sodium (DAOS) and 4-aminoantipyrene to produce a blue pigment. The product is proportional to the serum free cholesterol concentration.(Fujifilm Free Cholesterol E. Fujifilm Wako Pure Chemical Corporation; 12/2021)

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available
1 to 3 days

Specimen Retention Time
30 days

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 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
84311

LOINC® Information

Test Definition: CHLE

Cholesteryl Esters, Serum

Test ID	Test Order Name	Order LOINC® Value
CHLE	Cholesteryl Esters, S	21197-9

Result ID	Test Result Name	Result LOINC® Value
CHLES	Cholesteryl Esters, S	21197-9