

Alpha-Thalassemia

Background

DNA analysis provides definitive diagnosis of α -thalassemia trait and determines whether a patient has a one-gene deletion or a two-gene cis deletion. In the setting of reproductive counselling, identification of a two-gene cis deletion in both prospective parents indicates they are at risk of having a fetus with hemoglobin Bart hydrops fetalis, which is almost always fatal before birth. This test is performed by PCR analysis with primers that detect the $-\alpha^{3.7}$, $-\alpha^{4.2}$, $-\alpha^{SEA}$, and $-\alpha^{FIL}$ deletions. In some cases, Southern blot analysis with probes for the α -globin and the ζ -globin genes, which can identify most one- and two-gene deletions, is performed. A third probe called L0 directly identifies the $-\alpha^{Thai}$ and $-\alpha^{FIL}$ deletions, which delete the entire ζ - α gene complex and are not detectable with traditional α and ζ probes.

Indications for Testing

- Detection of prospective parents at risk for a pregnancy with Hb Bart hydrops fetalis
- Prenatal diagnosis of α -thalassemia in pregnancies at risk
- Differential diagnosis of microcytic anemia

Genetic Counseling

Genetic counseling can be useful to patients and families considering genetic testing. The laboratory can provide referrals to genetics clinics in the patient's locale or a listing can be found at www.genetests.org

Ordering

1. Obtain blood samples from patient(s).
 - If prenatal, call Genetics Lab with information on type of fetal sample and expected date of receipt
2. Fill out a Clinical Lab Request - Genetics for each patient
(available at <http://depts.washington.edu/labweb/Divisions/MolDiag/MolDiagGen/index.htm>).
 - Request: "Alpha-Thalassemia"
3. Provide items needed for test interpretation:
 - Reason for ordering test (e.g. carrier detection, prenatal diagnosis)
 - Clinical history (e.g. previous known or suspected hydropic pregnancy)
 - Family history/pedigree, ethnic background
 - Hematologic data (RBC indices, hemoglobin electrophoresis, quantitative HbA2, BCB inclusion body study, and iron studies)
4. Call Laboratory Medicine Community Services at (206)598-6066 to arrange the best method of shipment.

Sample Requirements and Specimen Handling

Whole blood - EDTA (purple top) - adults - 10 mL, children - 5 mL.
Samples should be received within 72 hours of collection.
Samples may be refrigerated until shipped.
For prenatal diagnosis specimens, consult laboratory.
Heparin (green top) tubes are not acceptable.

Test Frequency and Reporting

Test results usually within 1-2 weeks of specimen receipt. A written interpretative report is issued.

References

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