TEXAS Health and Human Services | Texas Department of State Health Services

Newborn Screening ACT Sheet

Elevated C4 and C5 +/- Other Acylcarnitines

Glutaryl-CoA Dehydrogenase Deficiency

Differential Diagnosis

Glutaric aciduria (GA-1)

Condition Description

Each GA-I is caused by a defect of glutaryl-CoA dehydrogenase, which limits the metabolism of glutaryl-CoA to crotonyl-CoA, resulting in increased glutaric acid (toxic) and its metabolites.

Conditions associated with this analyte have been identified by the Society of Inherited Metabolic Disorders (SIMD) as critical and require immediate action.

Take the Following Actions

- **Contact family IMMEDIATELY to inform them of the newborn screening result;**
- **Consult with pediatric metabolic specialist (See attached list.);**
- **Evaluate the newborn for macrocephaly and muscle hypotonia; initiate confirmatory/ diagnostic testing as recommended by metabolic specialist;**
- **Initial testing: Plasma acylcarnitine profile, urine organic acids;**
- **Repeat newborn screen if the second screen has not been done;**
- **Refer to metabolic specialist to be seen as soon as possible – not any later than three weeks;**
- **Educate family about diagnostic possibilities, complexity of diagnostic work-up, and the possibility of neurodegenerative crisis with an intercurrent infectious illness;**
- **IMMEDIATE treatment with IV glucose is needed for intercurrent infectious illness; and**
- **Report findings to newborn screening program.**

Diagnostic Evaluation

Urine organic acid analysis will reveal elevated glutaric acid, and 3-hydroxyglutaric acid should be ordered promptly and is often diagnostic. If urine organic acids don't confirm the diagnosis, the metabolic specialist will consider analyzing glutarylcarnitine in urine and 3-hydroxyglutaric acid in blood and CSF, enzyme assay in fibroblasts, and molecular analysis of the GCDH gene.

Clinical Considerations

The neonate with glutaric acidemia type I is usually macrocephalic, but otherwise asymptomatic. Later signs include metabolic ketoacidosis, failure to thrive, and sudden onset of dystonia and athetosis due to irreversible striatal damage. With appropriate treatment, 60-70% of patients will not suffer neurodegenerative disease.

Additional Information

U.S. National Library of Medicine, Medline Plus – Glutaric acidemia type I
Gene Tests/ Gene Clinics – Glutaric Acidemia Type 1
STAR G FELSI – Glutaric acidemia, type 1
STAR G FELSI – GA-1

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