Succinylacetone, Quantitative, Urine

Indications for Ordering

- Diagnose individuals with tyrosinemia type 1, in conjunction with organic and amino acids
- Monitor individuals with tyrosinemia type 1 who are on therapy

Test Description

Organic Acids, Urine
- Gas chromatography/mass spectrometry

Amino Acids Quantitative by LC-MS/MS, Plasma
- Quantitative liquid chromatography/tandem mass spectrometry

Succinylacetone, Quantitative, Urine
- Liquid chromatography/tandem mass spectrometry

Tests to Consider

Organic Acids, Urine 0098389 and Amino Acids Quantitative by LC-MS/MS, Plasma 2009389
- Recommended initial tests for evaluation of individuals with suspected tyrosinemia type 1
- Can provide information about other causes of elevated tyrosine or liver dysfunction

Succinylacetone, Quantitative, Urine 2007401
- For accurate quantitation of succinylacetone at diagnosis for tyrosinemia type 1, organic acids recommended as initial or concurrent test
- Monitor individuals with tyrosinemia type 1 who are on nitisinone (NTBC) therapy

Disease Overview

Prevalence and/or incidence – 1/100,000 worldwide
- Higher incidence
  - 1/16,000 French Canadians
  - 1/60,000 Norwegians

Age of onset – early infancy

Symptoms if untreated
- Renal tubular dysfunction with hypophosphatemic rickets
- Poor feeding
- Vomiting
- Hepatosplenomegaly
  - Clotting disorder from liver failure
- Porphyria-like neurological crisis

Later onset symptoms
- Growth retardation
- Bruising
- Hepatomegaly
- Cirrhosis

Physiology
- Tyrosinemia type 1 is caused by deficiency of fumarylacetoacetate hydrolase enzyme
- Enzyme is last step in metabolic pathway of phenylalanine and tyrosine
- Tyrosinemia type 1
  - Increases risk of hepatocellular carcinoma
  - Leads to accumulation of
    - Tyrosine
      - Can be normal on newborn screen
    - Fumarylacetoacetate
    - Maleylacetoacetate
    - Succinylacetone
      - Pathognomonic finding for tyrosinemia type 1
      - Reduces activity of δ-aminolevulinic acid (δ-ALA) dehydrogenase

Genetics

Gene – *FAH*

Inheritance – autosomal recessive

Test Interpretation

Results
- Elevated level of succinylacetone expected in untreated patients
- Normal level of succinylacetone usually expected in patients on therapy

Limitations

Succinylacetone testing cannot be used to determine carrier status