KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT

NEWBORN SCREENING ACT SHEET

SCREEN FOR: ELEVATED C16-OH +/- C18:1-OH AND OTHER LONG CHAIN ACYLCARNITINES

CONDITION: LONG-CHAIN 3-HYDROXYACYL-CoA DEHYDROGENASE DEFICIENCY (LCHADD) OR TRIFUNCTIONAL PROTEIN DEFICIENCY (TFP)

***DIFFERENTIAL DIAGNOSIS**:* Long-chain 3-hydroxyacyl-CoA dehydrogenase deficiency (LCHADD); Trifunctional protein deficiency (TFP).

METABOLIC DESCRIPTION: LCHAD and TFP deficiencies are fatty acid oxidation (FAO) disorders. FAO occurs during prolonged fasting and/or periods of increased energy demands (fever, stress) after glycogen stores become depleted and energy production relies increasingly on fat metabolism. Fatty acids and potentially toxic derivatives accumulate in FAO disorders which are caused by deficiency in one of the enzymes involved in FAO.

ACTION TO BE TAKEN **IMMEDIATELY:**

- Contact family to inform them of the newborn screening result and ascertain clinical status (poor feeding, vomiting and lethargy).
- Consult with pediatric metabolic specialist.
- Evaluate infant (Hepatomegaly, cardiac insufficiency; history of sudden unexpected death in a sibling, maternal liver disease during pregnancy; hypoglycemia). If signs are present or infant is ill, initiate emergency treatment in consultation with metabolic specialist.
- Educate family about signs and symptoms of hypoglycemia and metabolic acidosis.
- Report findings to newborn screening program.

CONFIRMATION OF DIAGNOSIS: Hypoglycemia, elevated liver transaminases, bilirubin, lactate, ammonia, and creatine phosphokinase (CPK) are suggestive of LCHAD and TFP deficiencies. Plasma acylcarnitine and urine organic acid analysis are first-line tests to determine if the appropriate LCHAD/TFP profiles are present. Differentiation between both disorders requires further biochemical and molecular genetic testing in cultured fibroblasts derived from a skin biopsy.

CLINICAL EXPECTATIONS: LCHAD and TFP deficiencies typically present acutely and are associated with high mortality unless treated promptly; milder variants exist. Hallmark features include hepatomegaly, cardiomyopathy, lethargy, hypoketotic hypoglycemia, elevated liver transaminases, lactic acidosis, and failure to thrive.

REPORTING: Report diagnostic result to family and Kansas NBS program.

SPECIALISTS:

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