Kansas Department of Health and Environment

Newborn Screening

ACT Sheet

KANSAS NEWBORN SCREENING PROGRAM

Mucopolysaccharidosis Type II

[Iduronate 2-Sulfatase Deficiency]

Differential Diagnosis: Multiple sulfatase deficiency.

Condition Description: Mucopolysaccharidosis Type II (MPS II, also known as Hunter syndrome), and multiple sulfatase deficiency (MSD), are lysosomal disorders. MPS II is caused by an isolated deficiency of iduronate 2-sulfatase (I2S), an enzyme required to break down mucopolysaccharides known as glycosaminoglycans (GAGs). MSD is an extremely rare condition caused by deficiency of an enzyme affecting the posttranslational activation of I2S and other sulfatases (such as ARSA). In both MPS II and MSD, GAGs accumulate while in MSD sulfatides also accumulate. Infants with MPS II are asymptomatic and males are predominantly affected given the disease's X-linked inheritance. MSD is autosomal recessive and may present in neonates as intrauterine growth restriction,respiratory distress, corneal clouding and dysmorphic features.

You Should Take the Following Actions:

- Inform family of the newborn screening result.
- Ascertain clinical status (newborns are expected to be asymptomatic).
- Consult with pediatric metabolic specialist.
- Evaluate the newborn (newborns with MPS II are expected to be asymptomatic).
- Initiate confirmatory/diagnostic testing and management, as recommended by the specialist.
- Provide the family with basic information about MPS II and MSD and their management.

ACTION TO BE TAKEN IN 24 HOURS:

- ☐ **Notify parents of newborn screening result**
- ☐ **Evaluate infant for signs and symptoms of MPS II (may not be present at birth):**
  - **`newborns are expected to be asymptomatic**
- ☐ **Contact metabolic Specialists (see on next page) immediately to refer the patient for further evaluation and discuss additional recommendations.**

Diagnostic Evaluation: **Leukocyte I2S and arylsulfatase A (ARSA) enzyme activity and measurement of urine GAGs and sulfatides:** Decreased I2S activity and normal ARSA activity are suggestive of MPS II, but these results do not exclude I2S pseudodeficiency which causes decreased enzyme activity without disease. Reduced I2S activity in isolation with elevated GAGs are consistent with MPS II. Reduced I2S and ARSA activities with elevated urine GAGs and sulfatides are consistent with MSD. **Molecular genetic testing** can confirm and differentiate these diagnoses.

Clinical Considerations: Although asymptomatic at birth, males with MPS II typically demonstrate progressive signs and symptoms beginning in the first year of life with short stature, coarse facial features, decreased joint mobility, macroglossia, inguinal hernias, hepatosplenomegaly, frequent upper respiratory tract infections; cognitive decline may present in childhood. Disease severity and progression are variable. Therapy should be initiated under the guidance of a specialist consisting of enzyme replacement therapy and symptomatic support. MSD is a neurodegenerative, multisystem disease of variable severity combining features of mucopolysaccharidoses and metachromatic leukodystrophy with onset usually in infancy. Treatment is supportive. (Rarity of MSD)

Reporting: Report diagnostic results to family and Kansas NBS program.

If MPS II is confirmed, Kansas Law 65-180 through 65-183 requires reporting findings back to KDHE by a physician. Financial assistance for MPS II clinic services and treatments may be available to the family upon application to the Special Health Care Needs (SHCN) program. A SHCN application will be sent to the baby's address. Parents or physicians can call SHCN at (785) 296-1313 for more information.

Specialists:

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