MAYO CLINIC LABORATORIES

Newborn Screening Act Sheet

Spinal Muscular Atrophy: Zero Functioning Copies of SMN1

Condition Description: Spinal muscular atrophy (SMA) is a progressive neuromuscular disease. This autosomal recessive disorder is primarily caused by homozygous pathogenic variants in *SMN1* that impacts the nerves used to control muscle movement. There is wide variability in severity and age of onset of SMA, and the number of functioning copies of *SMN2* can assist in determining the overall prognosis.

Medical Emergency – Take the following actions:

- Contact family to inform them of the newborn screening result and ascertain clinical status (hypotonia, muscle weakness, poor feeding, respiratory difficulties).
- Consult with pediatric neurologist and/or geneticist.
- Evaluate the newborn for signs of neuromuscular disease (hypotonia, weakness, poor feeding, respiratory difficulties). If any sign is present or infant is ill, transport to hospital for further evaluation and treatment in consultation with a neurologist or geneticist.
- Initiate timely confirmatory/diagnostic testing and management, as recommended by specialist.
- Provide family with basic information about SMA.

Diagnostic Evaluation: When patients have zero functional copies of *SMN1*, urgent clinical assessment of the patient's health status in consultation with the neurologist or genetic specialist is recommended.

Clinical Expectations: The clinical presentation of SMA ranges from a rapidly progressive infantile form, which is uniformly lethal by age 2 if untreated, to a later onset, slowly progressive form. All types of SMA are eventually associated with progressive muscle weakness and respiratory insufficiency. SMA is most commonly caused by a pathogenic deletion in both copies of the *SMN1* gene and has an estimated incidence of approximately 1 in 6,000 live births. Antisense oligonucleotide (ASO) therapy via intrathecal injection is available for all types of SMA and should be started as soon as possible for patients with the infantile form, and as recommended by specialists for patients with the milder form of SMA. Administration of injectable ASO therapy is highly complicated and should only be given under the guidance of a specialist with expertise in genetic neuromuscular disease.

Additional Information

Genetics Home Reference

Genetic Testing Registry

Baby's First Test

Mayo Clinic Laboratories Testing

None