Nemaline Myopathy 3

Alternative Names
NEM3
Myopathy, Actin, Congenital, with Excess of Thin Myofilaments
Nemaline Myopathy 3, with Intranuclear Rods
Myopathy, Actin, Congenital, with Cores

Record Category
Disease phenotype

WHO-ICD
Diseases of the nervous system > Diseases of myoneural junction and muscle.

Incidence per 100,000 Live Births
Unknown

OMIM Number
161800

Mode of Inheritance
Autosomal dominant
Autosomal recessive

Gene Map Locus
1q42.13

Description
Nemaline myopathy is a rare inherited myopathy that primarily affects skeletal muscles, and is characterized by weakness hypotonia, and depressed or absent deep tendon reflexes. There are six overlapping clinical classification of NM, which are classified by onset and severity of motor and respiratory involvement: severe congenital, Amish, intermediate congenital, typical congenital, childhood-onset, and adult-onset. The most common type is the typical congenital type (approximately 46%), which is a moderate form of the disease characterized by muscle weakness and feeding problems beginning in infancy. The severe congenital type (10-20% of patients) is associated with death in the first few months of life, and is characterized by severe hypotonia and little spontaneous movement.

Diagnosis of NEM is based on clinical evaluation and histopathological findings on muscle biopsy by the presence of thread- or rod-like structures (nemaline bodies) when stained with Gomori trichrome.

Molecular Genetics
Mutations in the ACTA1 gene account for 15 to 25 percent of all nemaline myopathy cases. The severity and the age of onset vary widely in patients with mutations in this gene. Most of these mutations are de novo. However, some of the cases have been reported with an autosomal dominant and, more rarely, an autosomal recessive inheritance. The encoded protein is a skeletal alpha (α)-actin, which plays an important role in skeletal muscles, and is an essential component of the sarcomeres.

Epidemiology in the Arab World

Saudi Arabia
Seidahmed et al., (2016) reported two brothers born to second cousins Saudi parents who presented with severe congenital hypotonia. They had two other brothers who died before the age of one year with severe hypotonia and respiratory failure. They both had smooth dermal ridges, myopathic facies, and bilateral cryptorchidism. Their neurological examination revealed minimal movements, generalized hypotonia, areflexia, with flexed knees, arthrogryposis of both upper and lower limbs, and extended elbows. They had severe head lag and rag-doll posture on ventral suspension. A heterozygous missense mutation (c.868G>A, p.Asp290Asn) in the ACTA1 gene was identified in both brothers. Both brothers died at the age of six and seven month of cardiopulmonary arrest.

References
Seidahmed MZ, Salih MA, Abdelbasit OB, Alassiri AH, Hussein KA, Miqdad A, Samadi A, Rasheed AA, Alorainy IA, Shaheen R, Alkuraya FS. Gonadal mosaicism for ACTA1 gene masquerading as autosomal recessive nemaline myopathy. Am J

Med Genet A. 2016; 170(8):2219-21. PMID: 27242277.

Related CTGA Records

Actin, Alpha, Skeletal Muscle 1

External Links

https://ghr.nlm.nih.gov/condition/nemaline-myopathy
https://rarediseases.org/rare-diseases/nemaline-myopathy/
http://www.malacards.org/card/nemaline_myopathy_3_autosomal_dominant_or_recessive
http://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=GB&Expert=607

Contributors

Nada Assaf. 15.11.2016