Muscle MRI in TRPV4-related congenital distal SMA

A 2-year-old boy and an 11-year-old girl showing marked weakness in proximal and distal muscles, atrophy of distal legs, and clubfoot were investigated for congenital spinal muscular atrophy (SMA) as suggested by EMG and muscle biopsy. Both children, who had normal SMN1 gene testing, harbored mutations (p.P97R; p.R232C) in TRPV4.1 MRI of muscle showed similar severe changes preserving biceps femoris (bf) and medial gastrocnemius (mg) in the lateral compartment of the thighs and medial gastrocnemius in the posteromedial calves (figure). The pattern is different from non-TRPV4 patients2 (E–F) where the medial compartment at thighs (with hypertrophy of adductor longus [al]) and anterior muscles at calf level (tibialis anterior [ta]) are spared.

Mutations in the TRPV4 gene1 are associated with autosomal dominant congenital dSMA, scapuloperoneal SMA, hereditary motor-sensory neuropathy 2C, and orthopedic clinical conditions ranging from spondylometaphyseal dysplasia to lethal neonatal metatropic dysplasia. In 2 sporadic patients (A–D) with dSMA harboring de novo mutations in TRPV4, an extensive fatty atrophy preserving biceps femoris (bf) and medial gastrocnemius (mg) was present at muscle MRI. This pattern is different from non-TRPV4 patients2 (E–F) where the medial compartment at thighs (with hypertrophy of adductor longus [al]) and anterior muscles at calf level (tibialis anterior [ta]) are spared.

A 2-year-old boy and an 11-year-old girl showing marked weakness in proximal and distal muscles, atrophy of distal legs, and clubfoot were investigated for congenital spinal muscular atrophy (SMA) as suggested by EMG and muscle biopsy. Both children, who had normal SMN1 gene testing, harbored mutations (p.P97R; p.R232C) in TRPV4.1 MRI of muscle showed similar severe changes preserving biceps femoris in the lateral compartment of the thighs and medial gastrocnemius in the posteromedial calves (figure). The pattern of myoimaging, unrelated to disease duration, is not seen in other congenital distal SMA2 and might facilitate appropriate molecular analyses.

G. Astrea, MD, G. Brica, MD, C. Fiorillo, MD, PhD, M. Valle, MD, M. Tosetti, PhD, C. Bruno, MD, PhD, F.M. Santorelli, MD, R. Battini, MD, PhD, Pisa (G.A., C.F., M.T., F.M.S., R.B.) and Genoa (G.B., M.V., C.B.), Italy
Author contributions: Study concept and design: Dr. Astrea, Dr. Santorelli, Dr. Bruno. Acquisition of data: Dr. Astrea, Dr. Brisca, Dr. Fiorillo, Dr. Valle, Dr. Tosetti. Analysis and interpretation of data: Dr. Astrea, Dr. Fiorillo, Dr. Bruno, Dr. Santorelli. Drafting of the manuscript: Dr. Astrea, Dr. Fiorillo. Critical revision of the manuscript for important intellectual content: Dr. Astrea, Dr. Brisca, Dr. Fiorillo, Dr. Valle, Dr. Tosetti, Dr. Bruno, Dr. Santorelli, Dr. Battini. Obtained funding: Dr. Bruno. Study supervision: Dr. Astrea, Dr. Santorelli.

Study funding: Supported in part by the Italian Ministry of Health, Regione Toscana grant RR5/09-RT (to C.B.) and Fondazione Telethon (Grant GUP08005 to C.B.).

Disclosure: Drs. Astrea, Brisca, Fiorillo, Valle, and Tosetti report no disclosures. Dr. Bruno receives research support from Regione Toscana and Telethon Foundation Italy. Drs. Santorelli and Battini report no disclosures.

Correspondence & reprint requests to Dr. Santorelli: filippo3364@gmail.com and to Dr. Astrea: gastrea@inpe.unipi.it


NeuroImages Are Free at www.neurology.org!

All Neurology® NeuroImages can now be freely accessed on the Neurology Web site. See them at www.neurology.org, where you can also sign up for journal email alerts and check out other online features, including the Resident & Fellow section, Neurology: Clinical Practice, and the weekly Neurology Podcasts.
Muscle MRI in TRPV4-related congenital distal SMA
G. Astrea, G. Brisca, C. Fiorillo, et al.
Neurology 2012;78;364-365
DOI 10.1212/WNL.0b013e318245295a

This information is current as of January 30, 2012