

PEDIATRIC NEUROLOGY BRIEFS

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VASCULAR DISORDERS

FIBROMUSCULAR DYSPLASIA AND CHILDHOOD STROKE

Investigators at the Alberta Children's Hospital Research Institute, University of Calgary; the Hospital for Sick Children, Toronto, and other centers in Canada screened Canadian pediatric stroke registries and the literature and found 81 cases (15 new, 66 from the literature) of pediatric stroke associated with fibromuscular dysplasia or renal arteriopathy. Twenty-seven patients had pathologically proven fibromuscular dysplasia, with predominant intimal fibroplasia in 89%; none had typical adult medial fibroplasia. Stroke was ischemic in 63% and hemorrhagic in 37%; multifocal in 40%. Onset was early and <12 months in 33%. Angiography showed a focal, stenotic arteriopathy in 78% and "string of beads" in 22%. Renal arteriopathy (63%) with hypertension (92%) was common, with systemic arteriopathy in 72%, and moya-moya in 35%. Therapies were anti-inflammatory in 29% and anti-thrombotic in 27%, and outcomes were poor in 63%, with stroke recurrence in 36%. Patients with clinically suspected fibromuscular dysplasias (n=31) were older, normotensive, and with string-of-beads angiography and good outcome. (Kirton A, Crone M, Benseler S, et al. Fibromuscular dysplasia and childhood stroke. **Brain** 2013 Jun;136(Pt 6):1846-56). (Response: Dr Adam Kirton. E-mail: adam.kirton@albertahealthservices.ca).

COMMENT. Fibromuscular dysplasias (FMDs) are a group of idiopathic, non-inflammatory arteriopathies with medial fibroplasia, typically affecting young adult females, with renal and cerebral vessel involvement, "string-of-beads" angiography, hypertension, and stroke (Slovut DP, et al. **N Engl J Med** 2004;350(18):1862-71). Three main categories of FMD are classified as medial, intimal, and perimedial fibroplasia, based on the site of disease in the arterial wall. Most pathologically proven cases of FMD reported in children do not have medial fibroplasia and the characteristic "string-of-beads" sign on angiography, and intimal fibroplasia predominates. Arterial imaging,

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craniocervical and systemic, should be considered in pediatric stroke when fibromuscular dysplasia is suspected. In a case-report of a 12-year-old boy with ischemic stroke caused by intracranial fibromuscular dysplasia, preliminary imaging investigations included CT and MR angiography, but a definitive diagnosis was reached following a conventional cerebral angiogram (Shea KJ, et al. **Pediatr Neurol** 2011 Mar;44(3):214-7).

MYOPATHIES

CONGENITAL RYR1-ASSOCIATED MYOPATHIES

Investigators from the Children's Hospital of Philadelphia, NINDS, and other centers in the US and France, report a series of 11 patients with severe neonatal RYR1-associated myopathy confirmed by genetic testing. Clinical features included decreased fetal movements, hypotonia, poor feeding, respiratory impairment, arthrogryposis, ophthalmoplegia, and femur fracture and hip dislocation at birth. RYR1 mutations were dominant in 4 patients and recessive in 7. Muscle ultrasound in 6 patients showed relative sparing of the rectus femoris muscle. All patients with dominant mutations had classic central cores on muscle biopsy; patients with recessive mutations showed histologic heterogeneity. (Bharucha-Goebel DX, Santi M, Medne L, et al. Severe congenital RYR1-associated myopathy. The expanding clinicopathologic and genetic spectrum. **Neurology** 2013 Apr 23;80(17):1584-9). (Resp.: Dr Bonnermann. Carsten.bonnermann@nih.gov).

COMMENT. Classic central core disease (CCD) due to mutations in the RYR1 gene typically presents with mild to moderate hypotonia, developmental delay, proximal muscle weakness, and occasional hip dislocation. The present series of patients has a more severe neonatal RYR1-associated myopathy caused by both dominant and recessive mutations of the gene and expands the clinical spectrum of central core disease. Sparing of the rectus femoris muscle on ultrasound should prompt evaluation for RYR1-associated myopathy.

Subtypes of congenital myopathies in UK. Of 54 patients with muscle biopsies available, diagnosed over a 5-year period at Great Ormond Street Hospital for Children, London, 29 (54%) had a core myopathy (central core disease, multi-minicore disease), 9 (17%) had nemaline myopathy, 7 (13%) had myotubular/centronuclear myopathy, 2 (4%) had congenital fibre type disproportion, 6 (11%) had isolated type 1 predominance and 1 (2%) a mixed core-rod myopathy. Of 44 with a genetic diagnosis, RYR1 was mutated in 26 (59%). The genetic defect was unidentified in 1/3 of congenital myopathies (Maggi L, Scoto M, Cirak S, et al. **Neuromuscul Disord** 2013 Mar;23(3):195-205).

RYR1 MUTATIONS, EXERTIONAL MYALGIA AND RHABDOMYOLYSIS

Investigators at Guy's & St Thomas' Hospital, London, UK, and other centers sequenced RYR1 in 39 unrelated families with rhabdomyolysis and/or exertional myalgia and identified 9 heterozygous RYR1 mutations in 14 families, 5 of them previously associated with malignant hyperthermia (MH). Index cases presented from 3 to 45 years