RHEUMATOLOGY

Letter to the Editor (Case report)

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Co-presentation of adult-onset systemic lupus erythematosus and nemaline myopathy

Rheumatology key message

- Considering muscle investigations may be appropriate in patients with connective tissue disease with unusual weakness.

SIR, Nemaline myopathy is seldom encountered in a rheumatology setting. We present a 28-year-old Caucasian woman, gravida 1 para 1, who attended 6 weeks post-partum with a history of proximal weakness (especially evident in the arms), breathlessness on mild exertion, arthralgia and symptoms suggestive of RP. While not present clinically, she also complained of photosensitive rashes, and possessed clear photographic evidence to support this.

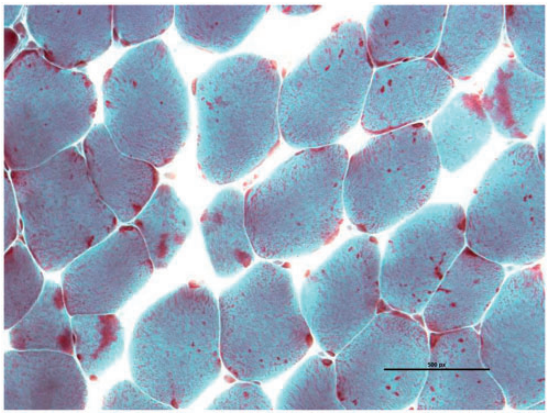
Since infancy, the patient was weaker than her peers. She required invasive support for nutrition during her first year of life, and as a child she was particularly prone to falls. Due to fears that she could not handle natural labour, she underwent a caesarean section. There was no family history of consanguinity or muscle weakness.

On examination, there was a generalized loss of muscle bulk, especially in the upper limbs. She had myopathic facies, scapular winging, spinal scoliosis and pectus excavatum. Her strength on Kendall Manual Muscle Testing was 9/10 symmetrically for shoulder abduction, hip flexion, hip extension and knee extension. Reflexes were generally reduced, and the Beighton score was 6/9. There was no clinical evidence of myotonia or fasciculations. Painless oral ulceration and patchy non-scarring alopecia were also noted.

Blood tests revealed: creatine kinase (CK) 18 iu/l (29–168), creatinine 45 μmol/l (53–97), ESR 12 mm/h, white cell count 4.3 $\times$ 10^9/l (4–11), lymphocytes 0.8 $\times$ 10^9/l (1–4), thyroid-stimulating hormone (TSH) 0.94 miu/l (<10), abnormal titration of ANA by multiplex immunoassay, Anti-dsDNA titre 87 iu/ml (0–13.9), C3 930 mg/l (630–1600), C4 222 mg/l (140–390) and negative extractable nuclear antibodies. A repeated white cell count was 2.6 $\times$ 10^9/l with lymphocytes of 0.8 $\times$ 10^9/l. Urinalysis was normal, and chest X-ray and pulmonary function tests were unremarkable.

Needle electromyography confirmed evidence of mild myopathic change in the proximal limb muscles, while MRI of both thighs revealed no oedema, fasciitis, atrophy or fatty replacement. A quadriceps muscle biopsy revealed a predominance of type 1 fibres, with many displaying rod-shaped eosinophilic accumulations on a modified Gomori trichrome preparation (see Fig. 1). There was no lymphocytic inflammation, MHC class I upregulation, or other suggestive features of inflammatory myopathy. Analysis with electron microscopy revealed rod-like electron dense structures along the subsarcomere in parallel alignments.

FIG. 1 Gomori trichome preparation of quadriceps muscle biopsy



The red-staining rod-like inclusions are characteristic of nemaline myopathy.

Genetic analysis confirmed congenital nemaline myopathy (CNM), identifying two heterozygous recessive mutations in the Nebulin gene: NEB c.7550dupT (p.Met2517fs), which is pathognomonic of the disease, and NEB c.4337 G > T (p.Gly1446Val). Nebulin is an important skeletal muscle protein that regulates the length and contractility of the thin filament. The former mutation results in premature termination of this protein, while the latter has been reported in genetic analysis of multiple families who suffer with nemaline myopathy. Both contribute to altering the cross-bridge cycling kinetics and calcium sensitivity of the thin filaments, resulting in the typical pattern of muscle weakness [1].

Based on our patient's additional symptoms and serology, we also diagnosed SLE [2]. HCQ was commenced, though there was no discernible improvement in weakness, despite a modest improvement in arthralgia and mouth ulcers.

Nemaline myopathy is defined by the presence of rod-shaped nemaline bodies in muscle fibres, and may be classified into congenital (severe, intermediate and typical); juvenile-onset; adult-onset; or other forms. CNM has a reported incidence of 2/100 000 live births [3], and is predominantly caused by dominant and recessive mutations in muscle proteins, including α-tropomyosin-3, β-tropomyosin, Nebulin, Actin α1, troponin-T type 1 and cofilin-2 [1]. The resulting symmetrical muscle weakness principally affects neck flexor, facial and bulbar muscles, though respiratory muscles may also be involved. The disease is familial, and usually manifests with gross motor developmental delay in

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childhood. This contrasts with sporadic late-onset nemaline myopathy, which has an autoimmune aetiology and usually manifests after the third decade of life.

Serum muscle enzymes in nemaline myopathy tend to be in the normal range, though CK may be elevated. Electromyography usually shows myopathic changes, while MRI may show areas of hyperintensity [4]. Histopathology with the Gomori trichrome technique typically shows red-stained, rod-shaped, predominantly cytoplasmic nemaline bodies [3].

CNM presenting in adulthood is rare, and can mimic other more common rheumatological diseases. PM, which presents with a similar pattern of muscle weakness, can exhibit nemaline bodies in muscle biopsies [5]. Nemaline bodies may also be seen in HIV, SS, monoclonal gammopathy and primary hypothyroidism [5, 6]. As in the described case, immune dysfunction may also worsen symptoms, unmasking hitherto undiagnosed CNM [6].

Treatment for nemaline myopathy is supportive, with breathing assistance, mobility aids and nasogastric feeding as required. Research into L-tyrosine and gene therapy may provide the potential to alter the disease course in the future [3]. To our knowledge, this is the first description of a patient co-presenting with CNM and SLE, and in such patients with a relevant childhood history, myalgia and weakness, further neuromuscular investigations may be appropriate, even in the face of a normal CK and imaging.

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