Twenty-year clinical progression of dysferlinopathy in patients from Dagestan

Umakhanova Z., Bardakov S., Mavlikeev M., Chernova O., Magomedova R., Akhmedova P., Yakovlev I., Dalgatov G., Fedotov V., Isaev A., Deev R. *Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia*

Abstract

© 2017 Umakhanova, Bardakov, Mavlikeev, Chernova, Magomedova, Akhmedova, Yakovlev, Dalgatov, Fedotov, Isaev and Deev. To date, over 30 genes with mutations causing limb-girdle muscle dystrophy have been described. Dysferlinopathies are a form of limb-girdle muscle dystrophy type 2B with an incidence ranging from 1:1,300 to 1:200,000 in different populations. In 1996, Dr. S. N. Illarioshkin described a family from the Botlikhsky district of Dagestan, where limb-girdle muscle dystrophy type 2B and Miyoshi myopathy were diagnosed in 12 members from three generations of a large Avar family. In 2000, a previously undescribed mutation in the DYSF gene (c.TG573/574AT; p. Val67Asp) was detected in the affected members of this family. Twenty years later, in this work, we re-examine five known and seven newly affected family members previously diagnosed with dysferlinopathy. We observed disease progression in family members who were previously diagnosed and noted obvious clinical polymorphism of the disease. A typical clinical case is provided.

http://dx.doi.org/10.3389/fneur.2017.00077

Keywords

Dysferlin, Dysferlinopathy, LGMD2B, Miyoshi myopathy, Muscular dystrophy

References

- [1] Illarioshkin SN, Ivanova-Smolenskaya IA, Tanaka H, Vereshchagin NV, Markova ED, Poleshchuk VV, et al. Clinical and molecular analysis of a large family with three distinct phenotypes of progressive muscular dystrophy. Brain (1996) 119:1895-909. doi:10.1093/brain/119.6.1895
- [2] Illarioshkin SN, Ivanova-Smolenskaya IA, Greenberg CR, Nylen E, Sukhorukov VS, Poleshchuk VV, et al. Identical dysferlin mutation in limb-girdle muscular dystrophy type 2B and distal myopathy. Neurology (2000) 55:1931-3. doi:10.1212/WNL.55.12.1931
- [3] Anderson LVB, Davison K, Moss JA, Young C, Cullen MJ, Walsh J, et al. Dysferlin is a plasma membrane protein and is expressed early in human development. Hum Mol Genet (1999) 8:855-61. doi:10.1093/hmg/8.5.855
- [4] Aoki M, Liu J, Richard I, Bashir R, Britton S, Keers SM, et al. Genomic organization of the dysferlin gene and novel mutations in Miyoshi myopathy. Neurology (2001) 57(2):271-8. doi:10.1212/WNL.57.2.271
- [5] Matsuda C, Hayashi YK, Ogawa M, Aoki M, Murayama K, Nishino I, et al. The sarcolemmal proteins dysferlin and caveolin-3 interact in skeletal muscle. Hum Mol Genet (2001) 10(17):1761-6. doi:10.1093/hmg/10.17.1761
- [6] Liu J, Aoki M, Illa I, Wu C, Fardeau M, Angelini C, et al. Dysferlin, a novel skeletal muscle gene, is mutated in Miyoshi myopathy and limb girdle muscular dystrophy. Nat Genet (1998) 20:31-6. doi:10.1038/1682
- [7] Bushby KM. Dysferlin and muscular dystrophy. Acta Neurol Belg (2000) 100:142-5.

- [8] Vilchez JJ, Gallano P, Gallardo E, Lasa A, Rojas-Garcia R, Freixas A, et al. Identification of a novel founder mutation in the DYSF gene causing clinical variability in the Spanish population. Arch Neurol (2005) 62:1256-9. doi:10.1001/archneur.62.8.1256
- [9] Weiler T, Bashir R, Anderson LVB, Davison K, Moss JA, Britton S, et al. Identical mutation in patients with limb girdle muscular dystrophy type 2B or Miyoshi myopathy suggests a role for modifier gene(s). Hum Mol Genet (1999) 8:871-7. doi:10.1093/hmg/8.5.871
- [10] Nakagawa M, Matsuzaki T, Suehara M, Kanzato N, Takashima H, Higuchi I, et al. Phenotypic variation in a large Japanese family with Miyoshi myopathy with nonsense mutation in exon 19 of dysferlin gene. J Neurol Sci (2001) 184:15-9. doi:10.1016/S0022-510X(00)00484-6
- [11] Kawabe K, Goto K, Nishino I, Angelini C, Hayashi YK. Dysferlin mutation analysis in a group of Italian patients with limb-girdle muscular dystrophy and Miyoshi myopathy. Eur J Neurol (2004) 11:657-61. doi:10.1111/j.1468-1331.2004.00755.x
- [12] Harris E, Bladen CL, Mayhew A, James M, Bettinson K, Moore U, et al. The Clinical Outcome Study for dysferlinopathy: an international multicenter study. Neurol Genet (2016) 2(4):e89. doi:10.1212/NXG.000000000000000
- [13] Suzuki N, Aoki M, Takahashi T, Takano D, Asano M, Shiga Y, et al. Novel dysferlin mutations and characteristic muscle atrophy in late-onset Miyoshi myopathy. Muscle Nerve (2004) 29(5):721-3. doi:10.1002/mus.20025
- [14] Nguyen K, Bassez G, Krahn M, Bernard R, Laforêt P, Labelle V, et al. Phenotypic study in 40 patients with dysferlin gene mutations: high frequency of atypical phenotypes. Arch Neurol (2007) 64:1176-82. doi:10.1001/archneur.64.8.1176