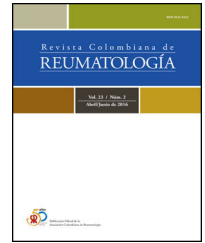




Asociación
Colombiana de
Reumatología®

Revista Colombiana de REUMATOLOGÍA

www.elsevier.es/rcreuma



Case Report

Atypical onset of idiopathic inflammatory myopathy sensitive to steroids under the mask of amyotrophic lateral sclerosis: A case report



Olexandr Kuryata^a, Tetiana Lysunets^b, Hanna Vorotilishcheva^b, Vadym Pashkovskiy^c, Viktor V. Semenov^{a,*}

^a Department of Internal Medicine 2 and Phthysiatry, Dnipro State Medical University, Dnipro, Ukraine

^b Department of Rheumatology, Mechnikov Dnipropetrovsk Regional Clinical Hospital, Dnipro, Ukraine

^c Department of Neurology, Mechnikov Dnipropetrovsk Regional Clinical Hospital, Dnipro, Ukraine

ARTICLE INFO

Article history:

Received 3 February 2022

Accepted 12 April 2022

Available online 28 May 2022

Keywords:

Idiopathic inflammatory myopathy

Amyotrophic lateral sclerosis

Atypical

Steroids

ABSTRACT

Idiopathic inflammatory myopathy is a heterogeneous group of autoimmune disorders, that share some common manifestations, such as muscle weakness and elevation of serum creatine kinase. However, classification of idiopathic inflammatory myopathy into an existing clinical subtype is not always possible. The case is a 25-year-old male with an unrecognized form of idiopathic inflammatory myopathy, the onset of which resembled amyotrophic lateral sclerosis. The paper includes differential diagnosis with amyotrophic lateral sclerosis and congenital myopathies, and response to corticosteroid therapy.

© 2022 Asociación Colombiana de Reumatología. Published by Elsevier España, S.L.U. All rights reserved.

Comienzo atípico de miopatía inflamatoria idiopática sensible a los esteroides bajo el manto de esclerosis lateral amiotrófica: caso clínico

RESUMEN

Las miopatías inflamatorias idiopáticas son un grupo heterogéneo de enfermedades autoinmunes que tienen ciertas manifestaciones clínicas como la debilidad muscular y el aumento del nivel de creatinina quinasa del suero en la sangre. Sin embargo, no siempre es posible hacer la clasificación de miopatía inflamatoria idiopática en el subtipo clínico existente. El caso clínico presentado describe a un varón de 25 años con una forma indeterminada de miopatía inflamatoria idiopática cuyo comienzo es parecido a la esclerosis lateral amiotrófica. En el trabajo se presenta el diagnóstico diferencial de esclerosis lateral amiotrófica y de miopatías hereditarias, así como la respuesta al tratamiento con corticosteroides.

© 2022 Asociación Colombiana de Reumatología. Publicado por Elsevier España, S.L.U. Todos los derechos reservados.

* Corresponding author.

E-mail address: semenovvikt@gmail.com (V.V. Semenov).

<https://doi.org/10.1016/j.rcreu.2022.04.001>

0121-8123/© 2022 Asociación Colombiana de Reumatología. Published by Elsevier España, S.L.U. All rights reserved.

Introduction

Idiopathic inflammatory myopathy (IIM) is a heterogeneous group of autoimmune disorders, that share some common manifestations, such as muscle weakness and elevation of serum creatine kinase (CK).¹ The presence of additional muscular, extramuscular and laboratory signs allows distinguishing a clinical phenotype of IIM.¹ In some cases classification of a patient into a distinct phenotype is challenging.²

Case presentation

A 25-years-old male was admitted to a hospital with complaints of weakness in the right hand and both feet, fasciculations in the muscles of the right shoulder, difficulties in the extension of the fingers of the right hand. The first symptoms appeared two years before the admission from disturbance of writing with the right hand, pain and limitation of movements in the right shoulder joint, weakness of muscles in the left hip. Since the onset of the disease a disruption of extension of the left index has been slowly progressing. The patient has lost 3 kg since the onset of the disease. He had a history of frequent traumatizing of the right hand without seeing a doctor and trauma of the cervical spine, when a 30 kg object had fallen on his neck. The patient had a history of professional sports (pole vaulting, boxing) in the past.

Shortly after the development of the first symptoms the patient was examined by neurologist. Neuromyography revealed neural injury (decreased conduction speed in the right radial nerve). Cranial and spine MRI revealed periventricular gliosis and posttraumatic deformation of processus spinosus Th1. ALS was suspected due to the suspected involvement of motoneurons of upper and lower limbs, presence of fasciculations³ and MRI findings. Genetic testing for ALS (Centre de Génétique Moléculaire et Chromosomique, Paris, France) did not reveal any known mutations that are associated with ALS (Table 1).⁴ Antibodies to Lyme disease were negative. Serum CK was above the normal range. The patient was referred to a rheumatologist with suspicion of polymyositis.

Table 1 – Laboratory tests after initial manifestations.

Test	Result
Genetic testing for ALS (genes ALS2, ANG, CHMP2B, DCTN1, FIG4, FUS, OPNT, SEXT, SOD1, SPG20, SQSTM1, TARDBP, TBK1, UBQLN2, VAPB, VCP)	Negative
SMN1 gene deletion	Negative
Lyme disease (IgM, IgG)	Negative
Creatine kinase (initial measurement)	341 units/l (normal range < 190)
Creatine kinase (repeated measurement)	516 units/l (normal range < 190)
C-reactive protein	1.40 mg/l (normal range < 5)

Table 2 – Laboratory tests after hospitalization to rheumatology department.

Test	Result
ANA	Negative
Autoantibodies: Ku, RNP, U1-nRNP, U3-nRNP, PM-SCL, Jo-1, Mi-1, Mi-2, MSA1, MSA2, HSAG5	Negative
C-reactive protein	1.55 mg/l (normal range < 5)
Creatine kinase	1003 units/l (normal range < 190)
Anti-HBsAg (IgM, IgG)	Negative
Anti-HCV (IgM, IgG)	Negative
Anti-HIV (IgM, IgG)	Negative

Note: ANA, antinuclear antibodies; HbsAg, hepatitis B surface antigen; HCV, hepatic C virus; HIV, human immunodeficiency virus.

Patient's condition on the examination by rheumatologist: the patient had a normal body weight (height 193 cm, weight 77 kg, body mass index 20.7 kg/m²), mild Raynaud's phenomenon in the hands, pronounced hypotrophy of the muscles of shoulder girdle, shoulders, forearms and hands (more on the right). A rash was absent and the patient denied the presence of a rash in the past. Swallowing of food and liquids was not disrupted, vocalization was not impaired. Palpation of the muscles of shoulder girdle, shoulder, forearm and hip was painful. The strength of shoulder girdle muscles was decreased. The patient was not able to stand up without help of hands from a chair. The fingers of the hands were in a slightly flexed position, Houston tabletop test was negative. Blood tests for antinuclear and myositis-specific antibodies, hepatitis B, C, human immunodeficiency virus were negative; serum CK was elevated, C-reactive protein was normal (Table 2). Muscle trephine biopsy (after magnetic resonance imaging scanning, from right quadriceps femoris muscle) showed muscle dystrophy and oedema. During two years of follow-up no evidence of neoplasm of any localization has been found.

As the patient's condition continued to deteriorate he agreed to undergo a trial treatment with steroids (methylprednisolone 16 mg/day). Three days after the onset of the treatment with steroids the patient reported diminution of pain and an increase of muscle strength in the hands and the legs (the patient began to stand up from a chair without help of the hands). Weakness of the right hand extensors and the fasciculations did not disappear. As the patient responded to steroids he was diagnosed with idiopathic inflammatory myopathy without further specification of the subset. The patient agreed to start a treatment with methotrexate (10 mg/week) with close monitoring of his condition.

Discussion

The classification of IIM has evolved in the last decades and now it includes five domains: dermatomyositis, overlap myositis, immune-mediated necrotizing myopathy, inclusion body myositis, and polymyositis.⁵ However, in some cases IIM

have unique clinical and laboratory signs that do not allow to classify them into existing subset.²

The patient's condition did not fulfill the diagnostic criteria of ALS as he had other symptoms that could explain the patient's complaints (significant elevation of CK)³ and as the genetic testing was negative (Table 1). However, the diagnosis of ALS could not be ruled out definitely: a mild rise of CK may be observed in motor neuron diseases⁶ and a negative genetic testing does not exclude ALS, as the patient could be carrying mutations that are unknown yet. The majority of genetic alterations that could lead to muscular atrophy develop either early in childhood or after 40–50 years.^{6–8} Development of the symptoms in the patient early in the third decade of life suggested in favor of low probability of genetic background of the disease. However, testing for SMN1 deletion was performed in order to exclude type 4 spinal muscular atrophy, which may occur in early adulthood.⁹ Simultaneously, a good response to steroid treatment testified not in favor of ALS or congenital myopathy. There is no data that steroids are effective in patients with ALS, and their effect in patients with congenital myopathies is contradictory.^{10,11}

The diagnosis of polymyositis was also doubtful, as the age of the disease onset was much younger than it is typical for polymyositis, skin manifestations were absent, muscle biopsy did not confirm immune inflammation in the muscles, there were nerve conduction abnormalities on neuromyography, and the test for autoantibodies was negative.¹² Several symptoms allowed to suspect inclusion body myositis (IBM): asymmetrical muscle involvement, neuropathy on neuromyography, a mild increase of serum CK and absence of antinuclear or myositis-specific antibodies.^{1,13} But the pattern of muscular involvement in IBM (in particular, IBM with a higher probability affects finger flexors, than extensors)¹³ is different from what was observed in the patient. The patient responded to the treatment with steroids which is highly unlikely for IBM.¹ The muscle biopsy did not reveal IBM-specific red-rimmed vacuoles.¹ Therefore, the diagnosis of IBM also could not be confirmed.¹³

IIM is a rare group of diseases that has heterogeneous clinical manifestations. Moreover, a clinical profile of IIM changes over time¹⁴ and new forms are being discovered.² Discovering new myositis-specific antibodies is in no doubt helpful in the diagnosis of IIM,¹⁵ but autoantibodies do not always accompany IIM.¹ Furthermore, according to recent studies myositis specific antibodies may have low sensitivity and low positive predictive value, thus having a limited application in clinical practice for diagnostic purposes.^{5,16} All of the above makes challenging the definite diagnosis of IIM.

Strict adherence to guidelines may be not beneficial for a patient, as the delay in diagnosis will result in the delay in treatment. "Laboratory tests should be used to confirm your clinical diagnosis not make it".¹ Despite the presence in the patient of muscle weakness and CK elevation (the hallmark of IIM), additional manifestations were absent, making the diagnosis according to the criteria challenging.¹ Given that the symptoms continued to worsen and CK levels increased it was decided to prescribe the trial treatment, which was successful. We suggest that patients with unknown forms of IIM may be prescribed with immunosuppressive treatment with a

purpose to relieve symptoms, after a careful rule out of other conditions that may have similar manifestations.

Conclusion

We suggest that the patient in the presented case report suffers from an unknown subset of IIM, that had an atypical amyotrophic lateral sclerosis-like onset and bears clinical sings of both polymyositis and inclusion body myositis. Further monitoring of the patient's condition will allow making a conclusion about the effectiveness of immunosuppressive therapy.

Ethical disclosures

Presented study complies with the Declaration of Helsinki and was approved by Ethics Committee of Mechnikov Dnipropetrovsk Regional Clinical Hospital. Informed consent for analysis and publishing medical information was obtained from the patient.

Conflict of interests

Authors declare no conflict of interests.

REFERENCES

- West SG, editor. *Rheumatology secrets*. 3rd ed. Philadelphia, PA: Elsevier; 2015.
- Murata K, Nakatani K, Yananeki M, Nakanishi I, Ito H. Anti-U3 ribonucleoprotein antibody-positive inflammatory myopathy: a case report. *J Med Case Rep*. 2016;10, <http://dx.doi.org/10.1186/s13256-016-0941-4>.
- Costa J, Swash M, de Carvalho M. Awaji criteria for the diagnosis of amyotrophic lateral sclerosis: a systematic review. *Arch Neurol*. 2012;69, <http://dx.doi.org/10.1001/archneurol.2012.254>.
- Hopitaux Universitaires La Pitie Salpetriere-Charles Foix, Unité Fonctionnelle de Neurogénétique Moléculaire et Cellulaire, Département de Génétique, Centre de Génétique Moléculaire et Chromosomique, Pôle de Biologie Médicale et Pathologie. Liste des gènes étudiés pour le diagnostic moléculaire de la sclérose latérale amyotrophique avec la technique de Next Generation Sequencing (NGS) [Internet]; 2019 [accessed 15 Feb 2022]. Available from: http://cgmc-psl.fr/IMG/pdf/liste_des_genes_sla_ngs_190205.pdf
- Montagnese F, Babačić H, Eichhorn P, Schoser B. Evaluating the diagnostic utility of new line immunoassays for myositis antibodies in clinical practice: a retrospective study. *J Neurol*. 2019;266:1358–66, <http://dx.doi.org/10.1007/s00415-019-09266-4>.
- Ralston SH, Penman ID, Strachan MW, Hobson RP, editors. *Davidson's principles and practice of medicine*. London: Elsevier Health Sciences; 2018.
- Savarese M, Sarparanta J, Vihola A, Jonson PH, Johari M, Rusanen S, et al. Panorama of the distal myopathies. *Acta Myol*. 2020;39:245–65, <http://dx.doi.org/10.36185/2532-1900-028>.
- Cassandrini D, Trovato R, Rubegni A, Lenzi S, Fiorillo C, et al. Congenital myopathies: clinical phenotypes and new

- diagnostic tools. *Ital J Pediatr.* 2017;43, <http://dx.doi.org/10.1186/s13052-017-0419-z>.
9. Pino MG, Rich KA, Kolb SJ. Update on biomarkers in spinal muscular atrophy. *Biomark Insights.* 2021;16, <http://dx.doi.org/10.1177/11772719211035643>.
 10. Sanzarello I, Merlini L, Traina F, Rosa MA, Faldini C. Corticosteroid treatment impact on spinal deformity in Duchenne muscular dystrophy. *Int Sch Res Not.* 2014;2014:1-9, <http://dx.doi.org/10.1155/2014/965235>.
 11. Baranello G, Gorni K, Daigl M, Kotzeva A, Evans R, Hawkins N, et al. Prognostic factors and treatment-effect modifiers in spinal muscular atrophy. *Clin Pharmacol Ther.* 2021;110:1435-54, <http://dx.doi.org/10.1002/cpt.2247>.
 12. Malik A, Hayat G, Kalia JS, Guzman MA. Idiopathic inflammatory myopathies: clinical approach and management. *Front Neurol.* 2016;7, <http://dx.doi.org/10.3389/fneur.2016.00064>.
 13. Rose MR, ENMC IBM Working Group. 188th ENMC International Workshop: Inclusion Body Myositis, 2-4 December 2011, Naarden, The Netherlands. *Neuromuscul Disord.* 2013;23:1044-55, <http://dx.doi.org/10.1016/j.nmd.2013.08.007>.
 14. Albrecht K, Huscher D, Callhoff J, Richter JG, Alexander T, Henes J, et al. Trends in idiopathic inflammatory myopathies: cross-sectional data from the German National Database. *Rheumatol Int.* 2020;40:1639-47, <http://dx.doi.org/10.1007/s00296-020-04634-0>.
 15. Satoh M, Tanaka S, Ceribelli A, Calise SJ, Chan EKL. A comprehensive overview on myositis-specific antibodies: new and old biomarkers in idiopathic inflammatory myopathy. *Clin Rev Allergy Immunol.* 2017;52:1-19, <http://dx.doi.org/10.1007/s12016-015-8510-y>.
 16. Lackner A, Tiefenthaler V, Mirzayeva J, Posch F, Rossmann C, Kastrati K, et al. The use and diagnostic value of testing myositis-specific and myositis-associated autoantibodies by line immuno-assay: a retrospective study. *Ther Adv Musculoskelet Dis.* 2020;12, <http://dx.doi.org/10.1177/1759720X20975907>.