NEU PRESS

SELÇUK TIP DERGİSİ
SELCUK MEDICAL JOURNAL

DOI:http:/dx.doi.org/10.30733/std.2025.01834
Selcuk Med J 2025;41(1): 52-54

OPEN

OLGU SUNUMU / CASE REPORT

Coexistence of Celiac Disease, Autism Spectrum Disorder and Duchenne Muscular Dystrophy: A Rare Case Report

Duchenne Kas Distrofisi, Otizm Spektrum Bozukluğu ve Çölyak Hastalığı Birlikteliği: Nadir Bir Olgu Sunumu

Kubra Kocakli[1], Selcuk Teke[2], Yasin Maruf Ergen[2], Edibe Gözde Başaran[2]

[1]Gülhane Training and Research Hospital, Department of Child Health and Diseases, Ankara, Türkiye
[2]Gülhane Training and Research Hospital, Department of Child Health and Diseases, Department of Pediatric Gastroenterology, Ankara, Türkiye

ÖZET

Çölyak hastalığı, genetik yatkınlığı olan bireylerde diyetsel glütene karşı gelişen otoimmün reaksiyonlarla karakterize bir enteropatik hastalıktır. Türkiye'de hastalığın prevalansının % 0,49 ile % 0,97 arasında olduğu bildirilmiştir. Duchenne kas distrofisi, distrofin genindeki mutasyonlardan kaynaklanan, genetik olarak iletilen bir nöromusküler hastalıktır. Hastalık X bağlı resesif olduğundan, erkeklerdeki insidans 1/ 3 500 ile 5 000 arasında değişmektedir. Otizm spektrum bozukluğu, sosyal iletişimdeki eksiklikler ve sınırlı, tekrarlayan davranışlarla karakterize edilen klinik olarak tanımlanmış bir nörogelişimsel bozukluktur. Türkiye'deki mevcut hastalık prevalansı kesin olarak belirlenmemiştir. Literatürde Duchenne kas distrofisi ve çölyak hastalığının birlikte görüldüğü iki vaka bildirilmiştir. Ancak, Duchenne kas distrofisi, çölyak hastalığı ve otizm spektrum bozukluğunun bir arada görüldüğü bir vaka literatürde bulunmamaktadır. Bu yazıda, çölyak hastalığı, Duchenne kas distrofisi ve otizm spektrum bozukluğu bulunan iki yaşındaki erkek bir hasta sunulmaktadır. Genetik temele dayanan bu üç hastalığın birbiriyle ilişkisi, mevcut literatür ışığında incelenmiştir.

Anahtar Kelimeler: Otizm spektrum bozukluğu, Çölyak Hastalığı, Duchenne Kas Distrofisi

ABSTRACT

Celiac disease is an enteropathy characterised by a series of autoimmune reactions against dietary gluten in genetically predisposed individuals. The disease is reported to have a prevalence of between 0.49 % and 0.97 % in Turkiye. Duchenne muscular dystrophy is a genetically transmitted neuromuscular disease resulting from mutations in the dystrophin gene. Since the disease is X-linked recessive, the incidence in boys varies between 1/ 3 500 –5 000. Autism spectrum disorder is a clinically defined neurodevelopmental disorder that is characterised by deficits in social communication and restricted, repetitive behaviours. The current prevalence of the disease in Turkiye is not definitively established. Two cases showing duchenne muscular dystrophy-celiac disease coexistence have been reported in the literature. However, there is no case in the literature in which duchenne muscular dystrophy, celiac disease and autism spectrum disorder coexist. In this article, a two-year-old male patient with celiac disease, duchenne muscular dystrophy and autism spectrum disorder is presented. The interrelationship between these three diseases with a genetic basis is examined in the context of existing literature.

Keywords: Autism spectrum disorder, Celiac Disease, Duchenne Muscular Dystrophy

Geliş Tarihi/Received: 9 January/Ocak 2025 **Kabul Tarihi/Accepted:** 10 March/Mart 2025 **Yayın Tarihi/Published Online:** 22 March/Mart 2025

INTRODUCTION

Celiac disease (CD) is an enteropathy characterized by a series of autoimmune reactions to dietary gluten in genetically predisposed individuals. The disease is reported to have a prevalence of between 0.49% and 0.97% in Turkiye (1, 2). Duchenne muscular dystrophy (DMD) is a genetically transmitted neuromuscular disease resulting from mutations in the dystrophin gene. Since the disease is X-linked recessive, the incidence in boys varies between 1/3500 -5000 (3).

Autism spectrum disorder (ASD) is a clinically defined neurodevelopmental disorder that is characterised by deficits in social communication and restricted, repetitive behaviours (4). The current prevalence of this disease in Turkiye has not yet been definitively established. Two cases of coexisting DMD-CD have been reported in the literature (5,6). However, there are no cases in the literature in which DMD, CD, and ASD coexist. In this article, a two-year-old male patient with CD, DMD and ASD is presented. The interrelationship between these three genetically based

Sorumlu Yazar/Corresponding Author: Kubra Kocakli, Gülhane Training and Research Hospital, Department of Child Health and Diseases, Ankara, Türkiye
e-mail: kubrakocakli97@gmail.com

Atıf yapmak için/ Cite this article as: Kocakli K, Teke S, Ergen YM, Basaran EG. Coexistence of Celiac Disease, Autism Spectrum Disorder and Duchenne Muscular Dystrophy: A Rare Case Report. Selcuk Med J 2025;41(1): 52-54

Disclosure: *Author has not a financial interest in any of the products, devices, or drugs mentioned in this article. The research was not sponsored by an outside organization. Author has agreed to allow full access to the primary data and to allow the journal to review the data if requested.*

"**This article is licensed under a** Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0)"

diseases is analysed in the context of the existing literature.

CASE REPORT

A two-year-old male patient was admitted with complaints of constipation, abdominal distension and growth retardation. His medical history showed that she was able to hold her head upright at three months, sit with support at seven months, sit unsupported at ten months, crawl at thirteen months and walk at fifteen months. He started spelling at the age of eight months and started speaking with two-syllable words at the age of two years. However, it was learned that the patient was followed up by our child psychiatry outpatient clinic with a diagnosis of ASD since the age of one year due to limited eye contact and repetitive movements since infancy. The patient was diagnosed with DMD P034: Exon 46,47,48,49,50 hemizygous deletion after an aetiological work-up in which a creatine kinase (CK) elevation (>17000 U/L, normal range: 39-308 U/L) was detected 3 months prior to admission. There was no family history of celiac disease or muscle disease. There was no consanguinity between the parents.

On physical examination, body weight was 12 kg (10-25p), height was 95 cm (50-75p) and head circumference was 49 cm (25-50p). Abdominal examination revealed diffuse tenderness in the periumbilical region. There was no defense or rebound. There was no hepatosplenomegaly. On neurological examination, muscle strength was 5/5 in the upper and lower extremities, and there was no Govers deficit. There was no pseudohypertrophy in the legs. Other neurological and systemic examination findings were normal. Hemoglobin 12.3 mg/dl, white blood cell 12 100 /mm^3, platelets 389 000 mm^3, aspartate aminotransferase: 283 U/L (normal range: 0- 56 U/L): 283 U/L (normal range: 0- 56 U/L), alanine aminotransferase: 325 U/L (normal range: 0- 39 U/L) and creatine kinase: 9739 U/L (normal range: 39 to 308 U/L). Other biochemical tests were normal. Serum immunoglobulin A (IgA) and serum immunoglobulin G (IgG) levels were normal for his age. Tissue transglutaminase IgA: 19.6 U/mL (normal range: 0- 10 U/mL) and tissue transglutaminase IgG: 151.6 U/mL (normal range: 0-10 U/mL) were found to be elevated. Upper gastrointestinal endoscopy performed with a prediagnosis of CD an revealed edematous appearance and prominent scalloping in the duodenum. Histopathologic evaluation revealed nearly complete villus atrophy and increased intraepithelial lymphocytes in the duodenum, consistent with modified Marsh type 3C. As a result of these findings, the patient was diagnosed with CD and a gluten-free diet was started. The patient continued to be followed up in our Pediatric Gastroenterology clinic and her gastrointestinal complaints decreased significantly at the 6th month of gluten-free diet.

DISCUSSION

Celiac Disease can be seen with different presentation findings as typical, atypical and silent disease (7). Autoimmune diseases such as selective Ig A deficiency, chromosome anomalies, type 1 diabetes mellitus may accompany CD or CD may be observed in the course of these diseases (8).

Neurological symptoms associated with CD are rare in children. Antibody cross-reactions, immune complex accumulation, neurotoxicity and vitamin or nutrient deficiency and gluten-mediated reactions play a role in the pathophysiology of neurological involvement in CD. Cerebellar ataxia, peripheral neuropathy, epileptic seizures, headaches, mild cognitive disorders, depressive disorders, bipolar disorders, schizophrenia, attention deficit/hyperactivity disorders and autism spectrum disorders may be observed (9). Our patient also exhibited features of both celiac disease and autism spectrum disorder.

Deletions in the dystrophin gene are responsible for DMD pathogenesis (10). Studies have shown that patients with DMD have varying degrees of cognitive impairment. Furthermore, the frequency of ASD and attention deficit/hyperactivity disorder has been found to be higher in DMD compared to the general population (10,11). Gastrointestinal findings in DMD are observed in the progressive stages of the disease and often occur due to smooth muscle involvement. Gastroparesis, decreased intestinal motility, and intestinal pseudo-obstruction may be observed in these patients (8). Nevertheless, the association of CD has only been documented on a few occasions. L. Stenhammar et al. (5) recorded a case of a 13-month-old male patient with DMD associated with CD. Another reported case was a 7-year-old male patient reported by Sharawat et al. (6).

Studies have reported that CD is more common in ASD patients. This is attributed to increased permeability of the intestinal barrier in ASD patients and the different intestinal microbiota compared to healthy individuals (12,13). In our case, the association of CD and DMD was also accompanied by ASD. No cases of CD, DMD, or ASD have been reported in the literature. We aim that our case will contribute to the literature in this respect and we think that more comprehensive studies are needed in this direction.

In conclusion, CD can be observed in DMD and ASD patients. As these patients are frequently disadvantaged and unable to adequately express their symptoms, it is imperative that they be questioned in terms of gastrointestinal symptoms. CD should be considered as a differential diagnosis, and morbidities that may develop should be prevented by ensuring an early diagnosis of CD in patients.

Conflict of interest: *The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.*

Financial conflict of interest: *Author declares that he did not receive any financial support in this study.*

Address correspondence to: *Kubra Kocakli, Gülhane Training and Research Hospital, Department of Child Health and Diseases, Ankara, Türkiye*
e-mail: *kubrakocakli97@gmail.com*

REFERENCES

1. Troncone R, Jabri B. Coeliac disease and gluten sensitivity. J Intern Med. 2011;269(6):582-90. doi: 10.1111/j.1365-2796.2011.02385.x.
2. Lionetti E, Catassi C. New clues in celiac disease epidemiology, pathogenesis, clinical manifestations, and treatment. Int Rev Immunol. 2011;30(4):219-31. doi: 10.3109/08830185.2011.602443.
3. Ryder S, Leadley RM, Armstrong N, et al. The burden, epidemiology, costs and treatment for Duchenne muscular dystrophy: an evidence review. Orphanet J Rare Dis. 2017;12(1):79. doi: 10.1186/s13023-017-0631-3.
4. Landa RJ, Gross AL, Stuart EA, et al. Developmental trajectories in children with and without autism spectrum disorders: the first 3 years. Child Dev. 2013;84(2):429-42. doi: 10.1111/j.1467-8624.2012.01870.x.
5. Stenhammar L, Klintberg B, Tevebring J, et al. Muscular dystrophy misdiagnosed as hepatic disease in a child with coeliac disease. Acta Paediatr. 1995;84(6):707-8. doi: 10.1111/j.1651-2227.1995.tb13738.x.
6. Sharawat IK, Sharma S, Suthar R, et al. Celiac Disease in a Boy with Duchenne Muscular Dystrophy: A Double Jeopardy! Ann Indian Acad Neurol. 2020;23(5):731-2. doi: 10.4103/aian.AIAN_40_19.
7. NIH Consensus Development Conference on Celiac Disease. NIH Consens State Sci Statements. 2004 ;21(1):1-23. PMID: 17308551.
8. Husby S, Koletzko S, Korponay-Szabó I, et al. European Society Paediatric Gastroenterology, Hepatology and Nutrition Guidelines for Diagnosing Coeliac Disease 2020. J Pediatr Gastroenterol Nutr. 2020;70(1):141-56. doi: 10.1097/MPG.0000000000002497.
9. Zelnik N, Pacht A, Obeid R, et al. Range of neurologic disorders in patients with celiac disease. Pediatrics. 2004;113(6):1672-6. doi: 10.1542/peds.113.6.1672.
10. Kunkel LM, Hejtmancik JF, Caskey CT, et al. Analysis of deletions in DNA from patients with Becker and Duchenne muscular dystrophy. Nature. 1986;322(6074):73-7. doi: 10.1038/322073a0.
11. Mirski KT, Crawford TO. Motor and cognitive delay in Duchenne muscular dystrophy: implication for early diagnosis. J Pediatr. 2014;165(5):1008-10. doi: 10.1016/j.jpeds.2014.07.006.
12. Adams JB, Johansen LJ, Powell LD, et al. Gastrointestinal flora and gastrointestinal status in children with autism--comparisons to typical children and correlation with autism severity. BMC Gastroenterol. 2011;11:22. doi: 10.1186/1471-230X-11-22.
13. Barcia G, Posar A, Santucci M, Parmeggiani A. Autism and coeliac disease. J Autism Dev Disord. 2008;38(2):407-8. doi: 10.1007/s10803-007-0480-3.