4. BÖLÜM

KETOJENİK DİYETİN ENDİKASYONLARI VE KONTRENDİKASYONLARI

Pakize KARAOĞLU[1]

Antiepileptik ilaçlar ile epilepsili hastaların yaklaşık 1/3'ünde nöbet kontrolü tam olarak sağlanamamaktadır.[1] Bu durumda ilaca dirençli epilepsiden söz edilebilir. Dirençli epilepsi uygun olarak seçilmiş ve tolere edilen iki antiepileptik ilacın, monoterapi ya da kombinasyon ile kullanılmasına rağmen nöbet kontrolünün sağlanamaması olarak tanımlanmaktadır.[2] Dirençli epilepsi hastalarında epilepsi cerrahisi, vagal sinir stimülasyonu ve ketojenik diyet tedavisi seçenekleri gündeme gelmektedir. Dirençli epilepsi ketojenik diyet tedavisi için en yaygın endikasyondur. Hem fokal hem de jeneralize başlangıçlı nöbetlerde etkili olabileceği bildirilmiştir.[3] Çalışmalarda ketojenik diyet uygulanan dirençli epilepsi hastalarının %30 ile %60'ında altı ayda nöbet sıklığında en az %50 oranında azalma olduğu gösterilmiştir. Ketojenik diyet bazı epileptik ensefalopatilerin tedavisinde de etkili bulunmuştur. Ohtahara sendromu, West sendromu, Lennox Gastaut sendromu, Dravet sendromu, Doose sendromu tedavisinde faydalı olduğu bildirilmiştir.[5]

Dirençli epilepsi dışında, beynin enerji metabolizmasındaki iki farklı bozuklukta ketojenik diyet ilk seçenek tedavidir. Bu hastalıklar glukoz transporter protein 1 (GLUT-1) eksikliği sendromu ve pirüvat dehidrogenaz eksikliğidir.[6,7] GLUT-1 eksikliğinde kan beyin bariyerinden glukoz taşınması bozulur. Pirüvat dehidrogenaz eksikliğinde piruvat asetil-CoA'ya metabolize edilemez. Ketojenik diyet bu iki hastalıkta metabolik defektleri atlayıp beyin için alternatif bir yakıt görevi gören ketonları sağlayarak etkili olur.

Ketojenik diyet tedavisi süt çocukluğu döneminden itibaren yetişkin dönem de dahil olmak üzere kullanılabilir. Önceden süt çocuklarının büyüme döneminde ketozisi sürdürmekte zorlanacağı düşünülüyor ve iki yaşın altındaki çocuklara ketojenik diyet önerilmiyordu. Fakat son dönemde yayınlanan çalışmalarda ketojenik diyet tedavisinin iki yaşın altındaki çocuklarda da güvenli ve etkili olduğu

[1] Uzm. Dr., SBÜ Dr. Behçet Uz Çocuk Hastalıkları ve Cerrahisi EAH Çocuk Nörolojisi Bölümü, pakizekaraoglu@gmail.com

KAYNAKLAR

1. Kwan P, Brodie MJ. Effectiveness of first antiepileptic drug. Epilepsia 2001; 42:1255.
2. Kwan P, Arzimanoglou A, Berg AT, et al. Definition of Drug Resistant Epilepsy: Consensus Proposal by the Ad Hoc Task Force of the ILAE Commission on Therapeutic Strategies. Epilepsia 2010;51:1069-1077.
3. Luat AF, Coyle L, Kamat D. The Ketogenic Diet: A Practical Guide for Pediatricians. Pediatr Ann 2016;45(12):e446-e450.
4. Freeman JM, Vining EP, Kossoff EH, et al. A blinded, crossover study of the efficacy of the ketogenic diet. Epilepsia 2009;50:322-325.
5. Sharma S, Tripathi M. Ketogenic diet in epileptic encephalopathies. Epilepsy Res Treat 2013;2013:652052.
6. Kass HR, Winesett SP, Bessone SK, et al. Use of dietary therapies amongst patients with GLUT1 deficiency syndrome. Seizure 2016; 35:83.
7. Sofou K, Dahlin M, Hallböök T, et al. Ketogenic diet in pyruvate dehydrogenase complex deficiency: short- and long-term outcomes. J Inherit Metab Dis 2017;40:237-245.
8. Dressler A, Trimmel-Schwahofer P, Reithofer E, et al. The ketogenic diet in infants-Advantages of early use. Epilepsy Res 2015;116:53-58.
9. Kim JA, Yoon JR, Lee EJ, et al. Efficacy of the classic ketogenic and the modified Atkins diets in refractory childhood epilepsy. Epilepsia 2016;57:51-58.
10. van der Louw E, van den Hurk D, Neal E, et al. Ketogenic diet guidelines for infants with refractory epilepsy. Eur J Paediatr Neurol 2016;20:798-809
11. Cervenka MC, Henry BJ, Felton EA, et al. Establishing an Adult Epilepsy Diet Center: experience, efficacy and challenges. Epilepsy Behav 2016;58:61–68.
12. Kossoff EH, Zupec-Kania BA, Auvin S,et al; Charlie Foundation; Matthew's Friends; Practice Committee of the Child Neurology Society. Optimal clinical management of children receiving dietary therapies for epilepsy: Updated recommendations of the International Ketogenic Diet Study Group. Epilepsia Open 2018;3(2):175-192.
13. Pascual JM, Liu P, Mao D, et al. Triheptanoin for glucose transporter type I deficiency (G1D): modulation of human ictogenesis, cerebral metabolic rate, and cognitive indices by a food supplement. JAMA Neurol 2014; 71:1255.
14. Kang HC, Lee YM, Kim HD, et al. Safe and effective use of the ketogenic diet in children with epilepsy and mitochondrial respiratory chain complex defects. Epilepsia 2007;48:82-88.
15. Caraballo RH, Cersósimo RO, Sakr D, et al. Ketogenic diet in patients with myoclonic-astatic epilepsy. Epileptic Disord 2006; 8:151.
16. Mullen SA, Marini C, Suls A, et al. Glucose transporter 1 deficiency as a treatable cause of myoclonic astatic epilepsy. Arch Neurol 2011; 68:1152.
17. Dressler A, Trimmel-Schwahofer P, Reithofer E, et al. Efficacy and tolerability of the ketogenic diet in Dravet syndrome-Comparison with various standard antiepileptic drug regimen. Epilepsy Res 2015;109:81-89.
18. Park S, Lee EJ, Eom S, et al. Ketogenic Diet for the Management of Epilepsy Associated with Tuberous Sclerosis Complex in Children. J Epilepsy Res 2017;7(1):45-49.
19. Prezioso G, Carlone G, Zaccara G, et al. Efficacy of ketogenic diet for infantile spasms: A systematic review. Acta Neurol Scand 2018;137:4-11.
20. Sivaraju A, Nussbaum I, Cardoza CS, et al. Substantial and sustained seizure reduction with ketogenic diet in a patient with Ohtahara syndrome. Epilepsy Behav Case Rep 2015;3:43-45.
21. Millichap JJ, Millichap JG. Ketogenic diet as preferred treatment of FIRES. Pediatr Neurol Briefs 2015;29:3.
22. Nabbout R, Mazzuca M, Hubert P, et al. Efficacy of ketogenic diet in severe refractory status epilepticus initiating fever induced refractory epileptic encephalopathy in school age children (FIRES). Epilepsia 2010;51:2033–2037.

23. Appavu B, Vanatta L, Condie J, et al. Ketogenic diet treatment for pediatric super-refractory status epilepticus. Seizure 2016;41:62-65.
24. Hosain SA, La Vega-Talbott M, Solomon GE. Ketogenic diet in pediatric epilepsy patients with gastrostomy feeding. Pediatr Neurol 2005;32:81-83.
25. Grocott OR, Herrington KS, Pfeifer HH, et al. Low glycemic index ttreatment for seizure control in Angelman syndrome: A case series from the Center for Dietary Therapy of Epilepsy at the Massachusetts General Hospital. Epilepsy Behav 2017;68:45-50.
26. Jurecka A, Opoka-Winiarska V, Rokicki D, et al. Neurologic presentation, diagnostics, and therapeutic insights in a severe case of adenylosuccinate lyase deficiency. J Child Neurol 2012;27:645–649.
27. Lim Z, Wong K, Olson HE, et al. Use of the ketogenic diet to manage refractory epilepsy in CDKL5 disorder: Experience of >100 patients. Epilepsia 2017;58:1415–1422.
28. Groomes LB, Pyzik PL, Turner Z, et al. Do patients with absence epilepsy respond to ketogenic diets? J Child Neurol 2011;26:160–165.
29. Swoboda KJ, Specht L, Jones HR, et al. Infantile phosphofructokinase deficiency with arthrogryposis: clinical benefit of a ketogenic diet. J Pediatr 1997;131:932–934.
30. Busch V, Gempel K, Hack A, et al. Treatment of glycogenosis type V with ketogenic diet. Ann Neurol 2005;58:341
31. Kossoff EH, Henry BJ, Cervenka MC. Efficacy of dietary therapy for juvenile myoclonic epilepsy. Epilepsy Behav 2013;26:162-164.
32. Caraballo R, Noli D, Cachia P. Epilepsy of infancy with migrating focal seizures: three patients treated with the ketogenic diet. Epileptic Disord 2015;17:194-197.
33. Jung DE, Kang HC, Kim HD. Long-term outcome of the ketogenic diet for intractable childhood epilepsy with focal malformation of cortical development. Pediatrics 2008;122:e330-e333.
34. Cardinali S, Canafoglia L, Bertoli S, et al. A pilot study of a ketogenic diet in patients with Lafora body disease. Epilepsy Res 2006;69:129-134.
35. Bergqvist AG, Chee CM, Lutchka LM, et al. Treatment of acquired epileptic aphasia with the ketogenic diet. J Child Neurol 1999;14:696-701.
36. Lemmon ME, Terao NN, Ng YT, et al. Efficacy of the ketogenic diet in Lennox-Gastaut syndrome: a retrospective review of one institution's experience and summary of the literature. Dev Med Child Neurol 2012;54:464-468.
37. Liebhaber GM, Riemann E, Baumeister FA. Ketogenic diet in Rett syndrome. J Child Neurol 2003;18:74–75.
38. Bautista RE. The use of the ketogenic diet in a patient with subacute sclerosing panencephalitis. Seizure 2003;12:175-177.
39. Kelley SA, Kossoff EH. How effective is the ketogenic diet for electrical status epilepticus of sleep? Epilepsy Res 2016;127:339-343.
40. Baumeister FA, Oberhoffer R, Liebhaber GM, Kunkel J, Eberhardt J, Holthausen H, Peters J. Fatal propofol infusion syndrome in association with ketogenic diet. Neuropediatrics 2004;35:250-252.
41. Stainman RS, Turner Z, Rubenstein JE, et al. Decreased relative efficacy of the ketogenic diet for children with surgically approachable epilepsy. Seizure 2007;16:615–619.
42. Stafstrom CE, Rho JM. The ketogenic diet as a treatment paradigm for diverse neurological disorders. Front Pharmacol 2012;3:59.
43. van der Louw EJTM, Williams TJ, Henry-Barron BJ, et al. Ketogenic diet therapy for epilepsy during pregnancy: a case series. Seizure 2017;45:198–201.