BÖLÜM 21

DİYABETİN PERİFERİK SİNİR SİSTEMİ KOMPLİKASYONLARI

Güneş ALTIOKKA UZUN[1]

GİRİŞ

Diyabetik periferik nöropati, diyabetes mellitus (DM) hastalığı bulunan bireylerde altta yatan başka bir neden bulunmaksızın, periferik sinir disfonksiyonu semptom ve/veya bulgularının varlığı olarak tanımlanmaktadır (1). DM, distal simetrik polinöropati gelişimi için en yaygın etyolojidir ve dünya çapında görülen en yaygın nöropati şeklidir. İleri yaşa ve uzun hastalık süresine sahip Tip 1 ve Tip 2 diyabetli bireylerde sık görülmesine rağmen, prevalansının Tip 2 DM bulunan kişilerde biraz daha yüksek olduğu bilinmektedir. Çalışmalar, diyabetli yetişkinlerin yaklaşık %50'sinin yaşamları boyunca, diyabetik periferik nöropatiden etkileneceğini göstermektedir (2). Nöropatili olguların %50'sinin asemptomatik olması nedeniyle ciddi ayak yaralanmalarının oluşabilmesi, semptomatik diyabetik nöropati için tedavi yöntemlerinin mevcut olması ve otonom tutulumun hasta için hayati risk oluşturabilmesi nedeniyle nöropatinin tanınması önem taşımaktadır.

DİYABETİK PERİFERİK NÖROPATİNİN PATOGENEZİ

Nöropatinin, oksidatif stres ve inflamasyon kaynaklı olduğu düşünülmektedir. Artmış aldolaz redüktaz yolu aktivitesi sonucu oluşan sorbitol ve fruktozun birikmesi, glikozun oto-oksidasyonu, proteinlerin enzimatik olmayan glikolizasyonu sonucu ileri glikolizasyon ürünlerinin oluşumu, protein kinaz C'nin aktivasyonu

[1] Uzm. Dr., İstanbul Üniversitesi Sağlık Bilimleri Enstitüsü, Elektro-Nöro Fizyoloji, mavilapina@gmail.com

Kronik İnflamatuvar Demiyelinizan Nöropati

DM olgularında kronik inflamatuvar demiyelinizan polinöropati (KIDP) ve diğer demiyelinizan nöropatiler görülebilir. Daha fazlası diyabetik nöropati de demiyelinizan karakterde olabilir ve hem KIDP hem de DM'de beyin omurilik sıvısı protein seviyesi yüksek olabilir. Bu durum tanı karışıklığına neden olabilir. Ayırım KIDP'nin intravenöz immunoglobulin veya immünmodülatörler ile tedavi edilebilmesinden dolayı önem kazanmaktadır. DM'nin KIDP'ye yatkınlık yaratıp yaratmadığının değerlendirilebilmesi amacıyla geniş sistemik çalışmalara ihtiyaç mevcuttur (41, 42).

KAYNAKLAR

1. Patel K, Horak H, Tiryaki E. Diabetic neuropathies. *Muscle &Nerve.* 2021;63(1):22-30.
2. Feldman EL, Callaghan BC, Pop-Busui R, et al. Diabetic neuropathy. Nature Reviews Disease Primers. 2019;5(1):41.
3. Calcutt NA. Diabetic neuropathy and neuropathic pain: a (con)fusion of pathogenic mechanisms? *Pain.* 2020;161(Suppl 1):S65-S86.
4. Albers JW, Pop-Busui R. Diabetic neuropathy: mechanisms, emerging treatments, and subtypes. *Current Neurology and Neuroscience Reports.* 2014;14(8):473.
5. Pop-Busui R, Boulton AJ, Feldman EL, et al. Diabetic Neuropathy: A Position Statement by the American Diabetes Association. *Diabetes Care.* 2017;40(1):136-154.
6. Boulton AJ. Diabetic neuropathy and foot complications. *Handbook of Clinical Neurology.* 2014;126:97-107.
7. Terkelsen AJ, Karlsson P, Lauria G, et al. The diagnostic challenge of small fibre neuropathy: clinical presentations, evaluations, and causes. *Lancet Neurology.* 2017;16(11):934-944.
8. Tesfaye S, Boulton AJ, Dyck PJ, et al. Diabetic neuropathies: update on definitions, diagnostic criteria, estimation of severity, and treatments. *Diabetes Care.* 2010;33(10):2285-2293.
9. Park JH, Kim DS. The Necessity of the Simple Tests for Diabetic Peripheral Neuropathy in Type 2 Diabetes Mellitus Patients without Neuropathic Symptoms in Clinical Practice. *Diabetes&Metabolism Journal.* 2018;42(5):442-446.
10. Gorson KC, Ropper AH. Additional causes for distal sensory polyneuropathy in diabetic patients. Journal of Neurology, Neurosurgery and Psychiatry. 2006;77(3):354-358.
11. Khdour MR. Treatment of diabetic peripheral neuropathy: a review. *Journal of Pharmacy and Pharmacology.* 2020;72(7):863-872.
12. Pop-Busui R, Boulton AJM, Sosenko JM. Peripheral and Autonomic Neuropathy in Diabetes. In: rd, Cowie CC, Casagrande SS, Menke A, Cissell MA, Eberhardt MS, et al., editors. *Diabetes in America.* Bethesda (MD)2018.
13. Kaur D, Tiwana H, Stino A, et al. Autonomic neuropathies. *Muscle&Nerve.* 2021;63(1):10-21.
14. Sharma JK, Rohatgi A, Sharma D. Diabetic autonomic neuropathy: a clinical update. *Journal of the Royal College of Physicians of Edinburg.* 2020;50(3):269-273.
15. Am VD, Siddiqui MS, Khandelwal E. Cardiac Autonomic Neuropathy (Can) in Newly Diagnosed Type 2 Diabetes Mellitus Patients. *Journal of the Association of Physicians of India.* 2022;70(4):11-12.

16. Agashe S, Petak S. Cardiac Autonomic Neuropathy in Diabetes Mellitus. *Methodist Debakey Cardiovascular Journal.* 2018;14(4):251-256.
17. AlOlaiwi LA, AlHarbi TJ, Tourkmani AM. Prevalence of cardiovascular autonomic neuropathy and gastroparesis symptoms among patients with type 2 diabetes who attend a primary health care center. *PLoS One.* 2018;13(12).
18. Spallone V, Ziegler D, Freeman R, et al. Cardiovascular autonomic neuropathy in diabetes: clinical impact, assessment, diagnosis, and management. *Diabetes/ Metabolism Research and Reviews.* 2011;27(7):639-653.
19. Idiaquez Rios JF, Lovblom LE, Perkins BA, et al. Orthostatic blood pressure changes and diabetes duration. *Journal of Diabetes and its Complications.* 2022;36(5).
20. Rajbhandari J, Fernandez CJ, Agarwal M, et al. Diabetic heart disease: A clinical update. *World Journal of Diabetes.* 2021;12(4):383-406.
21. Chowdhury M, Nevitt S, Eleftheriadou A, et al. Cardiac autonomic neuropathy and risk of cardiovascular disease and mortality in type 1 and type 2 diabetes: a meta-analysis. *BMJ Open Diabetes Research and Care.* 2021;9(2).
22. Piralaiy E, Siahkuhian M, Nikookheslat SD, et al. Cardiac Autonomic Modulation in Response to Three Types of Exercise in Patients with Type 2 Diabetic Neuropathy. *Journal of Diabetes& Metabolic Disorders.* 2021;20(2):1469-1478.
23. Meher M, Panda JK. Impact of glycemic control over cardiac autonomic neuropathy. *Journal of Diabetes& Metabolic Disorders.* 2020;19(2):1339-1344.
24. Shi M, Tang R, Huang F, et al. Cardiovascular disease in patients with type 1 diabetes: Early evaluation, risk factors and possible relation with cardiac autoimmunity. *Diabetes/Metabolism Research Reviews.* 2021;37(6).
25. Spallone V. Update on the Impact, Diagnosis and Management of Cardiovascular Autonomic Neuropathy in Diabetes: What Is Defined, What Is New, and What Is Unmet. *Diabetes&Metabolism Journal.* 2019;43(1):3-30.
26. Kurniawan AH, Suwandi BH, Kholili U. Diabetic Gastroenteropathy: A Complication of Diabetes Mellitus. *Acta Medica Indonesia.* 2019;51(3):263-271.
27. Almogbel RA, Alhussan FA, Alnasser SA, et al. Prevalence and risk factors of gastroparesis-related symptoms among patients with type 2 diabetes. *International Journal of Health Sciences (Qassim).* 2016;10(3):397-404.
28. Bharucha AE, Kudva YC, Prichard DO. Diabetic Gastroparesis. *Endocrine Reviews.* 2019;40(5):1318-1352.
29. Agochukwu-Mmonu N, Pop-Busui R, Wessells H, Sarma AV. Autonomic neuropathy and urologic complications in diabetes. *Autonomic Neurosciences.* 2020;229:102736.
30. Kempler P, Amarenco G, Freeman R, Frontoni S, Horowitz M, Stevens M, et al. Management strategies for gastrointestinal, erectile, bladder, and sudomotor dysfunction in patients with diabetes. *Diabetes/Metabolism Research Reviews.* 2011;27(7):665-677.
31. Rota E, Morelli N. Entrapment neuropathies in diabetes mellitus. *World Journal of Diabetes.* 2016;7(17):342-353.
32. Deguchi T, Nishio Y, Takashima H. [II. neurological diseases related to diabetes mellitus: 1. Diabetic peripheral neuropathies (diabetic polyneuropathy, focal and multifocal diabetic neuropathy, painful diabetic neuropathy]. *Nihon Naika Gakkai Zasshi.* 2012;101(8):2171-2179.
33. Chakraborty PP, Patra S, Barman H, et al. Cranial neuropathies in uncontrolled diabetes: May not always be due to diabetic microangiopathy. *BMJ Case Reports.* 2017;2017.

34. Samakidou G, Eleftheriadou I, Tentolouris A, et al. Rare diabetic neuropathies: It is not only distal symmetrical polyneuropathy. *Diabetes Research and Clinical Practice.* 2021;177:108932.
35. Tu MC, Chang YY, Lin TK. Recurrent multiple cranial neuropathies in a diabetic patient. *Acta Neurologica Taiwanica.* 2010;19(3):208-212.
36. Laughlin RS, Dyck PJ. Diabetic radiculoplexus neuropathies. *Handbook of Clinical Neurology.* 2014;126:45-52.
37. Dyck PJ, Norell JE, Dyck PJ. Non-diabetic lumbosacral radiculoplexus neuropathy: natural history, outcome and comparison with the diabetic variety. *Brain.* 2001;124(Pt 6):1197-1207.
38. Llewelyn D, Llewelyn JG. Diabetic amyotrophy: a painful radiculoplexus neuropathy. *Practica Neurology* 2019;19(2):164-167.
39. Massie R, Mauermann ML, Staff NP, et al. Diabetic cervical radiculoplexus neuropathy: a distinct syndrome expanding the spectrum of diabetic radiculoplexus neuropathies. *Brain.* 2012;135(Pt 10):3074-3088.
40. Gibbons CH. Treatment induced neuropathy of diabetes. *Autonomic Neurosciences.* 2020;226:102668.
41. Gorson KC, Ropper AH, Adelman LS, et al. Influence of diabetes mellitus on chronic inflammatory demyelinating polyneuropathy. *Muscle& Nerve.* 2000;23(1):37-43.
42. Rajabally YA, Peric S, Cobeljic M, et al. Chronic inflammatory demyelinating polyneuropathy associated with diabetes: a European multicentre comparative reappraisal. *Journal of Neurology, Neurosurgery and Psychiatry.* 2020;91(10):1100-1104.