Bölüm
5

DİYABETTE EGZERSİZ

Dilek BADAY KESKİN[1]

Düzenli fiziksel aktivite/egzersiz kardiyovasküler ve respiratuar fonksiyonları iyileştirir, kardiyovasküler hastalık riskini azaltır, birçok hastalığa (kardiyovasküler hastalık, inme, tip 2 diyabetes mellitus, metabolik sendrom, osteoporotik fraktür, kolon ve meme kanseri, safra kesesi hastalıkları) bağlı morbidite ve mortaliteyi, anksiyete ve depresyonu azaltır, kognitif fonksiyonları arttırır (1).

Egzersiz; yıllardır diyet ve ilaç tedavisinin yanı sıra Diyabetes Mellitus (DM) tedavisinin temel taşlarından birisi olarak kabul edilmektedir (2). DM tedavisinde ana hedef, diyet modifikasyonu, egzersiz ve/veya medikal tedavi ile glisemik kontrolü sağlamak, mikrokomplikasyon ve makrokomplikasyon gelişim riskini azaltmaktır (3). Diyabet ve prediyabet olan hastalarda, düzenli fiziksel aktivite ve egzersiz ile glukoz toleransında ve glisemik kontrolde artış, HbA1C seviyesinde düşüş olduğu bildirilmiştir (2–6). Tip 1 DM ve Tip 2 DM olan bireylerde egzersiz sonucu insülin duyarlılığı artmaktadır (3,7,8). Kan basıncı, lipid profili, endotelyal fonksiyon ve vücut yapısı üzerinde olumlu etkileri nedeniyle düzenli egzersiz diyabet ve kardiyovasküler hastalıklar açısından faydalıdır (7). Prediyabetik bireylerde düzenli egzersiz Tip 2 DM gelişimini önlemekte veya geciktirmektedir (3,5,7).

EGZERSİZİN GLUKOZ ALIMI VE REGÜLASYONU ÜZERİNE ETKİLERİ

Egzersiz ile akut dönemde stimüle edilen kas glukoz alımı, insülinden bağımsızdır (6,9). Egzersiz bu özelliği ile tip 2 DM ve obezite gibi insülin direnci görülen hastalarda, kan glukoz düzeyini düşüren mükemmel bir nonfarmakolojik tedavi metodudur (2,6,10). Ayrıca egzersiz fiziksel aktivite sonrası insülin duyarlılığını da arttırmaktadır (5,6,10). Uzun süreli bir egzersizden sonra yaklaşık 2 saat insü-

[1] Uzm. Dr. Dilek Baday-Keskin Erzincan Binali Yildirim Üniversitesi Fiziksel Tıp ve Rehabilitasyon dilekbaday@gmail.com

için uygun strateji belirlenmelidir (bazal insülin doz azaltılması, karbonhidrat alımı veya kombinasyonu gibi) (27).

Küçük çocuklarda termoregülatuar sistemin immatür olması sebebiyle sıcak çevre koşullarında egzersizden kaçınılmalıdır. Uygun hidrasyon yapılmalıdır (18). Astım, diyabet, obezite, kistik fibrozis, serebral palsi hastalığı olan çocuk ve adolesanlarda egzersiz programı; mevcut durumları, semptomları ve fiziksel fitnes seviyelerine uygun olarak belirlenmelidir (18).

KAYNAKLAR

1. American College of Sports Medicine. (2014). Health Appraisal and Risk Assessment. In: Pescatello LS, Arena R, Riebe D, Thompson PD, editors. ACSM'S Guidelines for Exercise Testing and Prescription Ninth Edition. (p. 2–34) Lippincott Williams & Wilkins.
2. Sigal RJ, Kenny GP, Wasserman DH, et al. Physical activity/exercise and type 2 diabetes. Diabetes Care. 2004 Oct;27(10):2518–39.
3. American College of Sports Medicine.(2014). Exercise Prescription for Populations with Other Chronic Diseases and Health Conditions. In: Pescatello LS, Arena R, Riebe D, Thompson PD, editors. ACSM'S Guidelines for Exercise Testing and Prescription Ninth Edition (p. 260–355). Lippincott Williams& Wilkins.
4. Colberg SR, Sigal RJ, Fernhall B, et al. Exercise and type 2 diabetes: the American College of Sports Medicine and the American Diabetes Association: joint position statement. Diabetes Care. 2010 Dec;33(12):e147-67.
5. Colberg SR, Sigal RJ, Yardley JE, et al. Physical Activity/Exercise and Diabetes: A Position Statement of the American Diabetes Association. Diabetes Care. 2016;39(11):2065–79.
6. Sylow L, Kleinert M, Richter EA, et al. Exercise-stimulated glucose uptake - regulation and implications for glycaemic control. Nat Rev Endocrinol. 2017;13(3):133–48.
7. Lumb A. Diabetes and exercise. Clin Med. 2014 Dec;14(6):673–6.
8. Codella R, Terruzzi I, Luzi L. Why should people with type 1 diabetes exercise regularly? Acta Diabetol. 2017 Jul;54(7):615–30.
9. Riddell MC, Gallen IW, Smart CE, et al, Adolfsson P, Lumb AN, et al. Exercise management in type 1 diabetes: a consensus statement. lancet Diabetes Endocrinol. 2017;5(5):377–90.
10. Kirwan JP, Sacks J, Nieuwoudt S. The essential role of exercise in the management of type 2 diabetes. Cleve Clin J Med. 2017 Jul;84(7 Suppl 1):S15–21.
11. Colberg SR, Laan R, Dassau E, et al. Physical activity and type 1 diabetes: time for a rewire? J Diabetes Sci Technol. 2015 May;9(3):609–18.
12. Dursun H. Tedavi Edici Egzersizler. (2015) Oğuz H, Haşim Ç, Yanık B (Ed). Tıbbi Rehabilitasyon 3 Baskı (sf 319–50). Nobel Tıp Kitabevleri.
13. Hoffman MaD, Kraemer WJ, Judelson DA (2010). Therapeutic Exercises. In: Frontera WR, Gans BM, Walsh NE, Robinson LR, editors. DeLisa' Physical Medicine and Rehabilitation Principles and Practice Fifth Edition. (p. 1619–72). Lippincott Williams & Wilkins.
14. Hordern MD, Dunstan DW, Prins JB, et al. Exercise prescription for patients with type 2 diabetes and pre-diabetes: a position statement from Exercise and Sport Science Australia. J Sci Med Sport. 2012 Jan;15(1):25–31.
15. Robert P. Wilder, Jeffrey G. Jenkins, Preeti Panchang SS.(2016). Therapeutic Exercises. In: CIFU DX, editor. Braddom's Physical Medicine and Rehabilitation Fifth Edition. (p.321–46). Elsevier Inc.
16. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Sigal RJ, Ar-

mstrong MJ, Colby P, et al. Physical activity and diabetes. Can J diabetes. 2013 Apr;37 Suppl 1:S40-4.
17. Jenkins DW, Jenks A. Exercise and Diabetes: A Narrative Review. J Foot Ankle Surg. 56(5):968–74.
18. American College of Sports Medicine. (2014). Exercise Prescription for Healthy Populations with Special Considerations and Environmental Considerations. In: Pescatello LS, Arena R, Riebe D, Thompson PD, editors. ACSM'S Guidelines for Exercise Testing and Prescription Ninth Edition. (p. 194–236). Lippincott Williams & Wilkins.
19. Wormgoor SG, Dalleck LC, Zinn C, et al. Effects of High-Intensity Interval Training on People Living with Type 2 Diabetes: A Narrative Review. Can J diabetes. 2017 Oct;41(5):536–47.
20. American College of Sports Medicine (2014). Exercise Testing. In: Pescatello LS, Arena R, Riebe D, Thompson PD, editors. ACSM'S Guidelines for Exercise Testing and Prescription Ninth Edition. (p. 39–161) Lippincott Williams & Wilkins.
21. Köseoğlu BF. Kardiyak Rehabilitasyon. (2016) Ayhan F (Ed). FTR Akıl Notları. (sf. 305–17) Güneş Tıp Kitabevleri.
22. Fletcher GF, Ades PA, Kligfield P, et al. Exercise standards for testing and training: a scientific statement from the American Heart Association. Circulation. 2013 Aug 20;128(8):873–934.
23. Fletcher GF, Balady GJ, Amsterdam EA, et al. Exercise standards for testing and training: a statement for healthcare professionals from the American Heart Association. Circulation. 2001 Oct 2;104(14):1694–740.
24. Riebe D, Franklin BA, Thompson PD, et al. Updating ACSM's Recommendations for Exercise Preparticipation Health Screening. Med Sci Sports Exerc. 2015 Nov;47(11):2473–9.
25. American College of Sports Medicine. Exercise Prescription. (2014) In: Pescatello LS, Arena R, Riebe D, Thompson PD, editors. ACSM'S Guidelines for Exercise Testing and Prescription Ninth Edition. (p. 161–355.) Lippincott Williams & Wilkins.
26. Maran A, Pavan P, Bonsembiante B, et al. Continuous glucose monitoring reveals delayed nocturnal hypoglycemia after intermittent high-intensity exercise in nontrained patients with type 1 diabetes. Diabetes Technol Ther. 2010 Oct;12(10):763–8.
27. Diabetes Canada Clinical Practice Guidelines Expert Committee, Sigal RJ, Armstrong MJ, Bacon SL, et al. Physical Activity and Diabetes. Can J diabetes. 2018 Apr;42 Suppl 1:S54–63.
28. Mendes R, Sousa N, Almeida A, et al. Exercise prescription for patients with type 2 diabetes-a synthesis of international recommendations: narrative review. Br J Sports Med. 2016 Nov;50(22):1379–81.
29. Thompson PD, Funk EJ, Carleton RA, et al. Incidence of death during jogging in Rhode Island from 1975 through 1980. JAMA. 1982 May 14;247(18):2535–8.
30. Burr JF, Shephard RJ, Riddell MC. Physical activity in type 1 diabetes mellitus: assessing risks for physical activity clearance and prescription. Can Fam Physician. 2012 May;58(5):533–5.
31. Franks PJ, Moffatt CJ, Murray S, et al. Evaluation of the performance of a new compression system in patients with lymphoedema. Int Wound J. 2013 Apr;10(2):203–9.
32. American College of Sports Medicine. (2014). Exercise Prescription for Patients with Cardiovascular and Cerebrovascular Disease . In: Pescatello LS, Arena R, Riebe D, Thompson PD, editors. ACSM'S Guidelines for Exercise Testing and Prescription Ninth Edition. (p. 236–60.) Lippincott Williams & Wilkins.
33. Hamasaki H. Daily physical activity and type 2 diabetes: A review. World J Diabetes [Internet]. 2016 Jun 25;7(12):243–51. Available from: http://www.ncbi.nlm.nih.gov/pubmed/27350847
34. Chao M, Wang C, Dong X, et al. The Effects of Tai Chi on Type 2 Diabetes Mellitus: A Meta-Analysis. J Diabetes Res. 2018;2018:7350567.
35. Ahn S, Song R. Effects of Tai Chi Exercise on glucose control, neuropathy scores, balance, and quality of life in patients with type 2 diabetes and neuropathy. J Altern Complement Med. 2012 Dec;18(12):1172–8.
36. Innes KE, Selfe TK. Yoga for Adults with Type 2 Diabetes: A Systematic Review of Controlled

Trials. J Diabetes Res. 2016;2016:6979370.
37. Innes KE, Vincent HK. The influence of yoga-based programs on risk profiles in adults with type 2 diabetes mellitus: a systematic review. Evid Based Complement Alternat Med. 2007 Dec;4(4):469–86.
38. Mottola MF, Artal R. Role of Exercise in Reducing Gestational Diabetes Mellitus. Clin Obstet Gynecol. 2016 Sep;59(3):620–8.