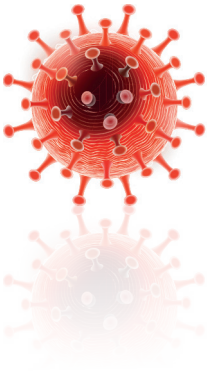

3. Bölüm

COVID-19 ve Tiroid

Mustafa AYDEMİR[1]

GİRİŞ

Koronavirüs hastalığı Aralık 2019'da Wuhan'da başlayan (COVID-19), küresel sağlık açısından benzeri görülmemiş sorunları olan yeni milenyumun salgınıdır(1). Sebep olan ajan, şiddetli akut solunum sendromu koronavirüs 2 (SARS-CoV-2) olarak adlandırılan yeni bir zarflı RNA β-koronavirüs 2' dir. SARS-CoV-2, şiddetli akut solunum sendromundan (SARS) sorumlu virüs olan SARS-CoV-1 ile filogenetik benzerliğe sahiptir. SARS-CoV-1'e benzer şekilde SARS-CoV-2, anjiyotensin dönüştürücü enzim 2 (ACE2) reseptörü aracılığıyla hücrelere giren insan dokularını enfekte eder(2-4).

Asemptomatik hafif seyirden, ciddi hipoksemik akut solunum yetersizliği ve çoklu organ yetersizliğine kadar değişen birbirinden farklı klinik seyirler gösterebilmektedir. SARS-CoV-2 enfeksiyonu hem pulmoner hem de sistemik inflamasyona neden olabilir ve yüksek risk faktörleri olan hastalarda (yani yaşlılık, erkek cinsiyet, kronik hipertansiyon ve diğer kardiyovasküler komorbiditeler, diyabet) çoklu organ işlev bozukluğunu belirleyebilir (5, 6). Akut solunum sıkıntısı sendromu (ARDS) ve solunum yetmezliği, sepsis, akut kardiyak hasar ve kalp yetmezliği, COVID-19'un en yaygın kritik komplikasyonları olarak kabul edilir (5). Hem doğrudan (hedef hücrelerin virüs enfeksiyonunun neden olduğu) hem de dolaylı yaralanma (virüse karşı anormal immün-enflamatuar yanıtlar yoluyla ve muhtemelen pıhtılaşma, sitokin ve tamamlayıcı sistemleri içeren) geniş klinik ekspresyon spektrumu ve multisistem ile ilişkilendirilmiştir (7).

[1] Öğr. Gör. Dr, Akdeniz ÜniversitesiTıp Fakültesi Endokrin ve Metabolizma Hastalıkları BD
aydemirmustafa@akdeniz.edu.tr

SONUÇ

Tiroidde virüsün immun histokimyasal değişikliklere neden olabileceği gösterilmiştir. Klinik öncesi ve klinik çalışmalar, tiroid bezinin COVID-19'un hedef organı olabileceğine dair ikna edici kanıtlar mevcuttur. COVID-19 hem tiroid bezini hemde tiroid aksını etkileyerek tiroid bozukluklarına ve hormonal değişikliklere yol açabileceği unutulmamalıdır. COVID-19'un ciddiyeti, tiroid hasarının tipine bağlıdır. Tirotoksikoz, COVID-19 hastalarında kliniği daha da kötüleştirmekte ve sonuçları olumsuz yönde etkilemektedir. "Tiroid ve COVID-19" ile ilgili toplanan çalışmalar, akut hastalık sırasında ve SARS- CoV-2'nin iyileşme döneminde tiroid fonksiyon testlerinin izlenmesi önerilmektedir. Hastalık seyri sırasında metabolik etkileri açısından tiroid hormon düzeylerindeki değişiklikler takip edilmeli ve hastalara ek sorun oluşturmaması ve iyileşme sürecine olan katkısı dolayısıyla hiper ve hipotiroidili hastaların tedavilerine ara verilmeden devam edilmelidir. Tiroid nodül ve kanserlerinde acil müdahale edilmesi gereken özel koşullar dışında tanıda yaşanan gecikme hastalığın seyrinde büyük bir değişikliğe neden olmamaktadır. Bununla birlikte, hastanede yatan COVID-19 vakalarında tirotoksikoz ve tiroid dışı hastalık sendromu tedavilerine ilişkin veriler eksiktir. Devam eden COVID-19 salgınının ne kadar süreceğini kimse bilmiyor, ancak önümüzdeki dönemde COVID-19 ve tiroid ilişkisini içeren datalara ve çalışmalara ihtiyaç olduğu kaçınılmazdır.

KAYNAKÇA

1. Organization WH. World Health Organization coronavirus disease (COVID-19) dashboard. 2020.
2. Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. A novel coronavirus from patients with pneumonia in China, 2019. New England journal of medicine. 2020.
3. Hoffmann M, Kleine-Weber H, Schroeder S, Krüger N, Herrler T, Erichsen S, et al. SARS-CoV-2 cell entry depends on ACE2 and TMPRSS2 and is blocked by a clinically proven protease inhibitor. cell. 2020;181(2):271-80. e8.
4. Ziegler CG, Allon SJ, Nyquist SK, Mbano IM, Miao VN, Tzouanas CN, et al. SARS-CoV-2 receptor ACE2 is an interferon-stimulated gene in human airway epithelial cells and is detected in specific cell subsets across tissues. Cell. 2020;181(5):1016-35. e19.
5. Chen T, Wu D, Chen H, Yan W, Yang D, Chen G, et al. Clinical characteristics of 113 deceased patients with coronavirus disease 2019: retrospective study. bmj. 2020;368.
6. Marazuela M, Giustina A, Puig-Domingo M. Endocrine and metabolic aspects of the COVID-19 pandemic. Reviews in Endocrine and Metabolic Disorders. 2020;21(4):495-507.
7. Ackermann M, Verleden SE, Kuehnel M, Haverich A, Welte T, Laenger F, et al. Pulmonary vascular endothelialitis, thrombosis, and angiogenesis in COVID-19. New England Journal of Medicine. 2020;383(2):120-8.

8. Velayoudom F-L, Wijewickrama PA, Ranathunga HI, Somasundaram N. Endocrine vigilance in COVID-19. J Pak Med Assoc. 2020;70(05).
9. Guo Y, Korteweg C, McNutt MA, Gu J. Pathogenetic mechanisms of severe acute respiratory syndrome. Virus research. 2008;133(1):4-12.
10. Gu J, Gong E, Zhang B, Zheng J, Gao Z, Zhong Y, et al. Multiple ogan infection and the pathogenesis of SARS. Journal of Experimental Medicine. 2005;202(3):415-24.
11. De Vito P, Incerpi S, Pedersen JZ, Luly P, Davis FB, Davis PJ. Thyroid hormones as modulators of immune activities at the cellular level. Thyroid. 2011;21(8):879-90.
12. Tomer Y, Davies TF. Infection, thyroid disease, and autoimmunity. Endocrine reviews. 1993;14(1):107-20.
13. Nishihara E, Ohye H, Amino N, Takata K, Arishima T, Kudo T, et al. Clinical characteristics of 852 patients with subacute thyroiditis before treatment. Internal Medicine. 2008;47(8):725-9.
14. Akamizu T. Thyroid storm: a Japanese perspective. Thyroid. 2018;28(1):32-40.
15. Davis PJ, Mousa SA, Schechter GP. New interfaces of thyroid hormone actions with blood coagulation and thrombosis. Clinical and Applied Thrombosis/Hemostasis. 2018;24(7):1014-9.
16. Wei L, Sun S, Xu C-h, Zhang J, Xu Y, Zhu H, et al. Pathology of the thyroid in severe acute respiratory syndrome. Human pathology. 2007;38(1):95-102.
17. Yao X, TY L. Histopathological study of new coronavirus pneumonia (COVID-19) in three patients. Chinese Journal of Pathology. 2020;49.
18. Lazartigues E, Qadir MMF, Mauvais-Jarvis F. Endocrine significance of SARS-CoV-2's reliance on ACE2. Endocrinology. 2020;161(9):bqaa108.
19. Li M-Y, Li L, Zhang Y, Wang X-S. Expression of the SARS-CoV-2 cell receptor gene ACE2 in a wide variety of human tissues. Infectious diseases of poverty. 2020;9:1-7.
20. Sigrist CJ, Bridge A, Le Mercier P. A potential role for integrins in host cell entry by SARS-CoV-2. Antiviral research. 2020;177:104759.
21. Davis PJ, Goglia F, Leonard JL. Nongenomic actions of thyroid hormone. Nature Reviews Endocrinology. 2016;12(2):111-21.
22. Davis PJ, Lin H-Y, Hercbergs A, Keating KA, Mousa SA. Coronaviruses and integrin αvβ3: does thyroid hormone modify the relationship? Endocrine Research. 2020;45(3):210-5.
23. Kerslake R, Hall M, Randeva HS, Spandidos DA, Chatha K, Kyrou I, et al. Co-expression of peripheral olfactory receptors with SARS-CoV-2 infection mediators: Potential implications beyond loss of smell as a COVID-19 symptom. International journal of molecular medicine. 2020;46(3):949-56.
24. Pellegrino R, Cooper KW, Di Pizio A, Joseph PV, Bhutani S, Parma V. Coronaviruses and the chemical senses: past, present, and future. Chemical senses. 2020;45(6):415-22.
25. Lania A, Sandri MT, Cellini M, Mirani M, Lavezzi E, Mazziotti G. Thyrotoxicosis in patients with COVID-19: the THYRCOV study. European journal of endocrinology. 2020;183(4):381-7.
26. Ding Y, He L, Zhang Q, Huang Z, Che X, Hou J, et al. Organ distribution of severe acute respiratory syndrome (SARS) associated coronavirus (SARS-CoV) in SARS patients: implications for pathogenesis and virus transmission pathways. The Journal of Pathology: A Journal of the Pathological Society of Great Britain and Ireland. 2004;203(2):622-30.
27. Wei L, Sun S, Zhang J, Zhu H, Xu Y, Ma Q, et al. Endocrine cells of the adenohypophysis in severe acute respiratory syndrome (SARS). Biochemistry and Cell Biology. 2010;88(4):723-30.
28. Hanley B, Naresh KN, Roufosse C, Nicholson AG, Weir J, Cooke GS, et al. Histopathological findings and viral tropism in UK patients with severe fatal COVID-19: a post-mortem study. The Lancet Microbe. 2020;1(6):e245-e53.
29. Boelaert K, Visser WE, Taylor PN, Moran C, Léger J, Persani L. Endocrinology in the time of COVID-19: management of hyperthyroidism and hypothyroidism. European journal of endocrinology. 2020;183(1):G33-G9.

30. Wang W, Ye Y, Yao H, Sun L, Wang A, Wang Z. Evaluation and observation of serum thyroid hormone and parathyroid hormone in patients with severe acute respiratory syndrome. J Chin Antituberculous Assoc. 2003;25:232-4.
31. Leow MKS, Kwek DSK, Ng AWK, Ong KC, Kaw GJL, Lee LSU. Hypocortisolism in survivors of severe acute respiratory syndrome (SARS). Clinical endocrinology. 2005;63(2):197-202.
32. Ross DS, Burch HB, Cooper DS, Greenlee MC, Laurberg P, Maia AL, et al. 2016 American Thyroid Association guidelines for diagnosis and management of hyperthyroidism and other causes of thyrotoxicosis. Thyroid. 2016;26(10):1343-421.
33. Brancatella A, Ricci D, Cappellani D, Viola N, Sgrò D, Santini F, et al. Is subacute thyroiditis an underestimated manifestation of SARS-CoV-2 infection? Insights from a case series. The Journal of Clinical Endocrinology & Metabolism. 2020;105(10):e3742-e6.
34. Ippolito S, Dentali F, Tanda M. SARS-CoV-2: a potential trigger for subacute thyroiditis? Insights from a case report. Journal of endocrinological investigation. 2020;43:1171-2.
35. Burch HB, Cooper DS. Antithyroid drug therapy: 70 years later. European journal of endocrinology. 2018;179(5):R261-R74.
36. Organization WH. Clinical management of severe acute respiratory infection (SARI) when COVID-19 disease is suspected: interim guidance, 13 March 2020. World Health Organization; 2020.
37. Pearce EN, Farwell AP, Braverman LE. Thyroiditis. New England Journal of Medicine. 2003;348(26):2646-55.
38. Desailloud R, Hober D. Viruses and thyroiditis: an update. Virol J. 2009;6:5.
39. Bellastella G, Maiorino MI, Esposito K. Endocrine complications of COVID-19: what happens to the thyroid and adrenal glands? J Endocrinol Invest. 2020;43(8):1169-70.
40. Pearce EN, Farwell AP, Braverman LE. Thyroiditis. N Engl J Med. 2003;348(26):2646-55.
41. Brancatella A, Ricci D, Cappellani D, Viola N, Sgrò D, Santini F, et al. Is Subacute Thyroiditis an Underestimated Manifestation of SARS-CoV-2 Infection? Insights From a Case Series. J Clin Endocrinol Metab. 2020;105(10).
42. Dhakal BP, Sweitzer NK, Indik JH, Acharya D, William P. SARS-CoV-2 Infection and Cardiovascular Disease: COVID-19 Heart. Heart Lung Circ. 2020;29(7):973-87.
43. Leow MK, Kwek DS, Ng AW, Ong KC, Kaw GJ, Lee LS. Hypocortisolism in survivors of severe acute respiratory syndrome (SARS). Clin Endocrinol (Oxf). 2005;63(2):197-202.
44. Horby P, Lim WS, Emberson JR, Mafham M, Bell JL, Linsell L, et al. Dexamethasone in Hospitalized Patients with COVID-19. N Engl J Med. 2021;384(8):693-704.
45. Lania A, Sandri MT, Cellini M, Mirani M, Lavezzi E, Mazziotti G. Thyrotoxicosis in patients with COVID-19: the THYRCOV study. Eur J Endocrinol. 2020;183(4):381-7.
46. Hariyanto TI, Kurniawan A. Thyroid disease is associated with severe coronavirus disease 2019 (COVID-19) infection. Diabetes Metab Syndr. 2020;14(5):1429-30.
47. Marazuela M, Giustina A, Puig-Domingo M. Endocrine and metabolic aspects of the COVID-19 pandemic. Rev Endocr Metab Disord. 2020;21(4):495-507.
48. Mateu-Salat M, Urgell E, Chico A. SARS-CoV-2 as a trigger for autoimmune disease: report of two cases of Graves' disease after COVID-19. J Endocrinol Invest. 2020;43(10):1527-8.
49. Boelaert K, Visser WE, Taylor PN, Moran C, Léger J, Persani L. ENDOCRINOLOGY IN THE TIME OF COVID-19: Management of hyperthyroidism and hypothyroidism. Eur J Endocrinol. 2020;183(1):G33-g9.
50. Ross DS, Burch HB, Cooper DS, Greenlee MC, Laurberg P, Maia AL, et al. 2016 American Thyroid Association Guidelines for Diagnosis and Management of Hyperthyroidism and Other Causes of Thyrotoxicosis. Thyroid. 2016;26(10):1343-421.
51. Kahaly GJ, Bartalena L, Hegedüs L, Leenhardt L, Poppe K, Pearce SH. 2018 European Thyroid Association Guideline for the Management of Graves' Hyperthyroidism. Eur Thyroid J. 2018;7(4):167-86.

52. Muller I, Cannavaro D, Dazzi D, Covelli D, Mantovani G, Muscatello A, et al. SARS-CoV-2-related atypical thyroiditis. The Lancet Diabetes & Endocrinology. 2020;8(9):739-41.
53. Chen M, Zhou W, Xu W. Thyroid Function Analysis in 50 Patients with COVID-19: A Retrospective Study. Thyroid. 2021;31(1):8-11.
54. Chaker L, Bianco AC, Jonklaas J, Peeters RP. Hypothyroidism. Lancet. 2017;390(10101):1550-62.
55. De Vries EM, Fliers E, Boelen A. The molecular basis of the non-thyroidal illness syndrome. J Endocrinol. 2015;225(3):R67-81.
56. Fliers E, Bianco AC, Langouche L, Boelen A. Thyroid function in critically ill patients. Lancet Diabetes Endocrinol. 2015;3(10):816-25.
57. Hercbergs A, Mousa SA, Davis PJ. Nonthyroidal Illness Syndrome and Thyroid Hormone Actions at Integrin αvβ3. J Clin Endocrinol Metab. 2018;103(4):1291-5.
58. Van den Berghe G. Non-thyroidal illness in the ICU: a syndrome with different faces. Thyroid. 2014;24(10):1456-65.
59. Peeters RP, Wouters PJ, van Toor H, Kaptein E, Visser TJ, Van den Berghe G. Serum 3,3',5'-triiodothyronine (rT3) and 3,5,3'-triiodothyronine/rT3 are prognostic markers in critically ill patients and are associated with postmortem tissue deiodinase activities. J Clin Endocrinol Metab. 2005;90(8):4559-65.
60. Li T, Wang L, Wang H, Gao Y, Hu X, Li X, et al. Characteristics of laboratory indexes in COVID-19 patients with non-severe symptoms in Hefei City, China: diagnostic value in organ injuries. Eur J Clin Microbiol Infect Dis. 2020;39(12):2447-55.
61. Pantos C, Kostopanagiotou G, Armaganidis A, Trikas A, Tseti I, Mourouzis I. Triiodothyronine for the treatment of critically ill patients with COVID-19 infection: A structured summary of a study protocol for a randomised controlled trial. Trials. 2020;21(1):573.
62. Korevaar TIM, Medici M, Visser TJ, Peeters RP. Thyroid disease in pregnancy: new insights in diagnosis and clinical management. Nat Rev Endocrinol. 2017;13(10):610-22.
63. Vrachimis A, Iakovou I, Giannoula E, Giovanella L. ENDOCRINOLOGY IN THE TIME OF COVID-19: Management of thyroid nodules and cancer. Eur J Endocrinol. 2020;183(1):G41-g8.
64. Tessler FN, Middleton WD, Grant EG, Hoang JK, Berland LL, Teefey SA, et al. ACR Thyroid Imaging, Reporting and Data System (TI-RADS): White Paper of the ACR TI-RADS Committee. J Am Coll Radiol. 2017;14(5):587-95.
65. Chatterjee S, Ghosh R, Biswas P, Dubey S, Guria RT, Sharma CB, et al. COVID-19: the endocrine opportunity in a pandemic. Minerva Endocrinol. 2020;45(3):204-27.
66. Dai M, Liu D, Liu M, Zhou F, Li G, Chen Z, et al. Patients with Cancer Appear More Vulnerable to SARS-CoV-2: A Multicenter Study during the COVID-19 Outbreak. Cancer Discov. 2020;10(6):783-91.
67. Tsang VHM, Gild M, Glover A, Clifton-Bligh R, Robinson BG. Thyroid cancer in the age of COVID-19. Endocr Relat Cancer. 2020;27(11):R407-r16.
68. Zhang D, Fu Y, Zhou L, Liang N, Wang T, Del Rio P, et al. Thyroid surgery during coronavirus-19 pandemic phases I, II and III: lessons learned in China, South Korea, Iran and Italy. J Endocrinol Invest. 2021;44(5):1065-73.