DÜNDEN BUGÜNE KORONAVİRÜSLER

2. BÖLÜM

Mehmet GÜNDÜZ [1]

GİRİŞ

Koronavirüsler (Coronavirus, CoV) Nidovirales takımı, Cornidovirineae alt takımı, Coronaviridae ailesi, Orthocoronavirinae alt ailesi, Betacoronavirus cinsine ait bir virüs türüdür. Bilinen en büyük RNA genomuna sahip virüstür. Elektron mikroskop altındaki görüntüsü, dış yüzeyindeki çıkıntılardan dolayı güneşin taç küresine benzemesinden dolayı ismi taç anlamına gelen latince *corona* sözcüğünden türemiştir[1-3].

Koronavirüsler insanlarda ve hayvanlarda solunum yolu ve intestinal enfeksiyonlara yol açar. Ancak 2002-2003'te Çin ve diğer uzak doğu ülkelerinde ortaya çıkan ağır akut solunum sendromu (Severe acute respiratory syndrome; SARS) salgınına kadar sadece immünkompetan hastalarda hafif hastalık tablosuna yol açtığı ve virüsün insanlar için yüksek düzeyde patojenik olmadığı düşünülmekteydi. SARS'tan 10 yıl kadar sonra Suudi Arabistan ve diğer bazı Orta Doğu ülkelerinde ortaya çıkan Orta Doğu solunum sendromu (Middle East respiratory syndrome; MERS) salgını ve 2019 yılı Aralık ayında Çin'de ortaya çıkıp tüm dünyada büyük bir pandemiye yol açan koronavirüs hastalığı-2019 (Coronavirus disease-2019; COVID-19) koronavirüslerin artık o kadar da "zararsız" olmadıklarını göstermiştir[1,4-6].

MORFOLOJİ

Koronavirüs pozitif polariteli (RNA bağımlı RNA polimeraz içermez), tek iplikçikli RNA genomuna sahip zarflı bir virüstür. Yapısal proteinleri S, E, M, HE ve N proteinleridir (1,8):

[1] Dr. Öğ. Üyes, Unvan, Medipol Univeristesi, Tıp Fakültesi, Eğitim Arraştırma hastanesi, Çocuk Hastalıkları Kliniği, Sefaköy, İstanbul, mgunduz@medipol.edu.tr

KAYNAKÇA

1. Cui J, Li F, Shi ZL. Origin and evolution of pathogenic coronaviruses. *Nat Rev Microbiol, 17* (3):181-192. doi:10.1038/s41579-018-0118-9.
2. Masters PS. The molecular biology of coronaviruses. *Adv Virus Res, 66* :193-292. doi:10.1016/S0065-3527(06)66005-3.
3. Chen Y, Liu Q, Guo D. Emerging coronaviruses: Genome structure, replication, and pathogenesis. *J Med Virol, 92* (4):418-423. doi:10.1002/jmv.25681.
4. Zhong, N. S. et al. Epidemiology and cause of severe acute respiratory syndrome (SARS) in Guangdong, People's Republic of China, in February, 2003. Lancet. 2003;362:1353–1358.
5. Kanra G, Kara A. SARS: Şiddetli akut solunum yetmezliği sendromu. Çocuk Sağlığı ve Hastalıkları Dergisi. 2003;46:155-161.
6. İnal S. Middle East Respiratory Syndrome-Coronavirus (MERS-CoV) Enfeksiyonu: Ortadoğu Solunum Yetmezliği Sendromu-Koronavirüs Enfeksiyonu. *Okmeydanı Tıp Dergisi, 32* :37-45, doi:10.5222/otd.2016.037.
7. Corman VM, Muth D, Niemeyer D, Drosten C. Hosts and Sources of Endemic Human Coronaviruses. *Adv Virus Res, 100* :163-188. doi:10.1016/bs.aivir.2018.01.001.
8. Li F. Structure, Function, and Evolution of Coronavirus Spike Proteins. *Annu Rev Virol, 3* (1):237-261. doi:10.1146/annurev-virology-110615-042301.
9. Fehr AR, Perlman S. Coronaviruses: an overview of their replication and pathogenesis. *Methods Mol Biol, 1282* :1-23. doi:10.1007/978-1-4939-2438-71.
10. Weiss SR, Leibowitz JL. Coronavirus pathogenesis. *Adv Virus Res, 81* :85-164. doi:10.1016/B978-0-12-385885-6.00009-2.
11. Masters PS. Coronavirus genomic RNA packaging. *Virology. 537* :198-207. doi:10.1016/j.virol.2019.08.031.
12. Salata C, Calistri A, Parolin C, Palù G. Coronaviruses: a paradigm of new emerging zoonotic diseases. *Pathog Dis, 77* (9):ftaa006. doi:10.1093/femspd/ftaa006.
13. Gralinski LE, Baric RS. Molecular pathology of emerging coronavirus infections. *J Pathol, 235* (2):185-195. doi:10.1002/path.4454
14. Su S, Wong G, Shi W, et al. Epidemiology, Genetic Recombination, and Pathogenesis of Coronaviruses. *Trends Microbiol, 24* (6):490-502. doi:10.1016/j.tim.2016.03.003.
15. Shereen MA, Khan S, Kazmi A, Bashir N, Siddique R. COVID-19 infection: Origin, transmission, and characteristics of human coronaviruses. *J Adv Res, 24* :91-98. doi:10.1016/j.jare.2020.03.005.
16. Xie M, Chen Q. Insight into 2019 novel coronavirus - An updated interim review and lessons from SARS-CoV and MERS-CoV. Int J Infect Dis. 2020;94:119-124. doi:10.1016/j.ijid.2020.03.071.
17. https://www.who.int/csr/sars/country/2003_07_11/en/
18. Hui DS, Wong PC, Wang C. SARS: clinical features and diagnosis. *Respirology, 8* (Suppl 1):S20-S24. doi:10.1046/j.1440-1843.2003. 00520.x .
19. https://www.cdc.gov/sars/guidance/b-surveillance/app1.html.
20. Matsuyama R, Nishiura H, Kutsuna S, Hayakawa K, Ohmagari N. Clinical determinants of the severity of Middle East respiratory syndrome (MERS): a systematic review and meta-analysis. *BMC Public Health, 16* (1):1203. doi:10.1186/s12889-016-3881-4.
21. Morra ME, Van Thanh L, Kamel MG, et al. Clinical outcomes of current medical approaches for Middle East respiratory syndrome: A systematic review and meta-analysis. *Rev Med Virol, 28* (3):e1977. doi:10.1002/rmv.1977 .
22. https://www.who.int/emergencies/mers-cov/en/
23. https://www.ecdc.europa.eu/en/news-events/epidemiological-update-middle-east-respiratory-syndrome-coronavirus-mers-cov-4
24. https://www.who.int/news-room/fact-sheets/detail/middle-east-respiratory-syndrome-coronavirus-(mers-cov).

25. https://www.coronavirus.gov.
26. https://www.nih.gov/coronavirus.
27. Ciotti M, Angeletti S, Minieri M, et al. COVID-19 Outbreak: An Overview [published online ahead of print, 2020 Apr 7]. *Chemotherapy, 1-9.* doi:10.1159/000507423.
28. Palacios Cruz M, Santos E, Velázquez Cervantes MA, León Juárez M. COVID-19, a worldwide public health emergency [published online ahead of print, 2020 Mar 20]. COVID-19, una emergencia de salud pública mundial. *Rev Clin Esp,* S0014-2565(20)30092-8. doi:10.1016/j.rce.2020.03.001.
29. https://www.worldometers. info/ coronavirus utmcampaign=home Advegas1?
30. https://covid19bilgi.saglik.gov.tr/tr.
31. Yuki K, Fujiogi M, Koutsogiannaki S. COVID-19 pathophysiology: A review. *Clin Immunol; 215*: 108427. doi:10.1016/j.clim.2020.108427.
32. Kadkhoda K. COVID-19: an Immunopathological View. mSphere. 2020;5(2):e00344-20.22. doi:10.1128/mSphere.00344-20.
33. Shi Y, Wang G, Cai XP, et al. An overview of COVID-19. J Zhejiang *Univ Sci B, 21* (5):343-360. doi:10.1631/jzus.B2000083.
34. Ge H, Wang X, Yuan X, et al. The epidemiology and clinical information about COVID-19. *Eur J Clin Microbiol Infect Dis; 39* (6):1011-1019. doi:10.1007/s10096-020-03874-z.
35. Wang Y, Wang Y, Chen Y, Qin Q. Unique epidemiological and clinical features of the emerging 2019 novel coronavirus pneumonia (COVID-19) implicate special control measures. *J Med Virol. 92* (6):568-576. doi:10.1002/jmv.25748.
36. Tu H, Tu S, Gao S, Shao A, Sheng J. Current epidemiological and clinical features of COVID-19; a global perspective from China. *J Infect. 81* (1):1-9. doi:10.1016/j.jinf.2020.04.011.
37. Hassan SA, Sheikh FN, Jamal S, Ezeh JK, Akhtar A. Coronavirus (COVID-19): A Review of Clinical Features, *Diagnosis, and Treatment. 38*: 12 (3):e7355. doi:10.7759/cureus.7355.
38. Pascarella G, Strumia A, Piliego C, et al. COVID-19 diagnosis and management: a comprehensive review. *J Intern Med, 10.1111* /joim.13091. doi:10.1111/joim.13091.
39. Ye Z, Zhang Y, Wang Y, Huang Z, Song B. Chest CT manifestations of new coronavirus disease 2019 (COVID-19): a pictorial review. *Eur Radiol, 1-9.* doi:10.1007/s00330-020-06801-0.
40. Hani C, Trieu NH, Saab I, et al. COVID-19 pneumonia: A review of typical CT findings and differential diagnosis. *Diagn Interv Imaging, 101* (5):263-268. doi:10.1016/j.diii.2020.03.014.
41. Hong KH, Lee SW, Kim TS, et al. Guidelines for Laboratory Diagnosis of Coronavirus Disease 2019 (COVID-19) in Korea. Ann Lab Med. 2020;40(5):351-360. doi:10.3343/alm.2020.40.5.351.
42. Sinha N, Balayla G. Hydroxychloroquine and covid-1. *Postgrad Med J, 2020*-137785. doi:10.1136/postgradmedj-2020-137785.
43. Eaaswarkhanth M, Al Madhoun A, Al-Mulla F. Could the D614G substitution in the SARS-CoV-2 spike (S) protein be associated with higher COVID-19 mortality? *Int J Infect Dis, 96* :459-460. doi:10.1016/j.ijid.2020.05.071.
44. Karacan I, Akgun TK, Agaoglu NB, et al. The origin of SARS-CoV-2 in Istanbul: Sequencing findings from the epicenter of the pandemic in Turkey. *North Clin Istanb, 7* (3):203-209. doi:10.14744/nci.2020.90532.
45. Kim SJ, Nguyen VG, Park YH, Park BK, Chung HC. A Novel Synonymous Mutation of SARS-CoV-2: Is This Possible to Affect Their Antigenicity and Immunogenicity? *Vaccines, (Basel), 8* (2):E220. Published 2020 May 14. doi:10.3390/vaccines8020220.
46. Koyama T, Weeraratne D, Snowdon JL, Parida L. Emergence of Drift Variants That May Affect COVID-19 Vaccine Development and Antibody Treatment. *Pathogens, 9* (5):324. doi:10.3390/pathogens 9050324.
47. Maitra A, Sarkar MC, Raheja H, et al. Mutations in SARS-CoV-2 viral RNA identified in Eastern India: Possible implications for the ongoing outbreak in India and impact on viral structure and host susceptibility. *J Biosci, 45* (1):76. doi:10.1007/s12038-020-00046-1.