



Interleukin-6 polymorphism

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Abstract

Emerged coronavirus disease 2019 (COVID-19) is a pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Disease severity is associated with elevated levels of proinflammatory cytokines, such as interleukin-6 (IL-6).

Key Words: Coronavirus disease 2019 (COVID-19), IL-6, Single nucleotide polymorphism, PCR-RFLP.

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Introduction

The pandemic of Coronavirus Disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has become the worst public health crisis once a century which has caused over 97 million human infections and 2 million deaths all over the world (1).

It had been found that all people are susceptible to SARS-CoV-2 without significant differences in sex or age (2) and SARS-CoV-2 infects children under 18-year-old at a similar rate as adults (3).

The newly described coronavirus disease (COVID-19), caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has strained healthcare systems around the world (4).

The overwhelming influx of COVID19-infected patients to many hospitals presents a need to thoroughly understand the clinical, radiological, and laboratory findings associated with greater disease severity and mortality (5). polymorphisms on the IL6 promoter region are connected with risk of pneumonia (Che5) and IL6 polymorphism such as -174G/C SNP (6) and 321G/T (7) were associated with COPD in different Caucasian population while in certain Asian population, it was not significantly associated with COPD (8).

The gene encoding human IL-6 is located on chromosome 7p21-14, and several single-nucleotide polymorphisms (SNPs) in the coding and non-coding regions of this gene have been reported (9).

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The differences in cytokine production among different individuals may be due to the presence of SNPs that occur in critical regulatory regions, such as promoters, introns, and the 5'-UTR and 3'-UTR regulatory regions, which may affect the expression level of cytokines, whereas genetic polymorphisms in the gene-coding regions can lead to loss or change of function in the expressed proteins (10). Many studies have demonstrated that the genetic polymorphisms at rs1800795 (-174 G > C), rs1800796 (-572 G > C), and rs1800797 (-597 G > A) of the IL-6 gene promoter are associated with serum levels of IL-6, prevalence, incidence, and/or progression of various diseases, such as sepsis, chronic obstructive pulmonary disease (COPD), hepatocellular carcinoma (HCC), and cancers (11). The role of polymorphisms in genes encoding IL-6 in the severity of COVID-19 is unclear.

REFERENCES

1. Millán-Oñate J, Rodríguez-Morales A.J., Camacho-Moreno G., Mendoza-Ramírez H, Rodríguez-Sabogal I.A., Álvarez-Moreno C. A new emerging zoonotic virus of concern: the 2019 novel Coronavirus (SARS CoV-2) *Infectio*. 2020;24(3):187-192. [Google Scholar]
2. Wu F, Zhao S.u., Yu B., Chen Y.-M., Wang W., Song Z.-G., Hu Y.i., Tao Z.-W., Tian J.-H., Pei Y.-Y., Yuan M.-L., Zhang Y.-L., Dai F.-H., Liu Y.i., Wang Q.-M., Zheng J.-J., Xu L., Holmes E.C., Zhang Y.-Z. A new coronavirus associated with human respiratory disease in China. *Nature*. 2020;579(7798):265-269. [PMC free article] [PubMed] [Google Scholar]
3. Zhou P, Yang X.L., Wang X.G., Hu B., Zhang L., Zhang W., Si H.-R., Zhu Y., Li B., Huang C.-L., Chen H.D., Chen J., Luo Y., Guo H., Jiang R.-D., Liu M.Q., Chen Y., Shen X.R., Wang X., Zheng X.-S., Zhao K., Chen Q.J., Deng F., Liu L.L., Yan B., Zhan F.X., Wang Y.Y., Xiao G.F., Shi Z.L. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*. 2020;579(7798):270-273. [PMC free article] [PubMed] [Google Scholar]
4. Yang X, Yu Y., Xu J., Shu H., Liu H., Wu Y., Zhang L., Yu Z., Fang M., Yu T. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. *Lancet Respir. Med*. 2020;8(5):475-481. [PMC free article] [PubMed] [Google Scholar]
5. Wu Z., McGoogan J.M. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. *JAMA*. 2020;323(13):1239-1242. [PubMed] [Google Scholar]
6. J. Brábek, D. Rosel, M. Fernandes, Repurposing of bazedoxifene to prevent cytokine storm in COVID-19 patients.
7. Costela-Ruiz V.J., Illescas-Montes R., Puerta-Puerta J.M., Ruiz C., Melguizo-Rodríguez L. SARS-CoV-2 infection: The role of cytokines in COVID-19 disease. *Cytokine Growth Factor Rev*. 2020;54:62-75. [PMC free article] [PubMed] [Google Scholar]
8. Bhaskar S., Sinha A., Banach M., Mittoo S., Weissert R., Kass J.S., Rajagopal S., Pai A.R., Kutty S. Cytokine storm in COVID-19—immunopathological mechanisms, clinical considerations, and therapeutic approaches: the REPROGRAM consortium position paper. *Front. Immunol*. 2020;11:1648. [PMC free article] [PubMed] [Google Scholar]
9. Ponti G., Maccaferri M., Ruini C., Tomasi A., Ozben T. Biomarkers associated with COVID-19 disease progression. *Crit. Rev. Clin. Lab. Sci*. 2020;57(6):389-399. [PMC free article] [PubMed] [Google Scholar]
10. Velavan T.P., Meyer C.G. Mild versus severe COVID-19: laboratory markers. *Int. J. Infect. Dis*. 2020;95:304-307. [PMC free article] [PubMed] [Google Scholar]
11. Herold T., Jurinovic V., Arnreich C., Hellmuth J.C., von Bergwelt-Baildon M., Klein M., Weinberger T. Level of IL-6 predicts respiratory failure in hospitalized symptomatic COVID-19 patients. *MedRxiv*. 2020 [PMC free article] [PubMed] [Google Scholar]

