

DAFTAR PUSTAKA

- Abbas, Andrew Lichtman, Shiv Pillai, 2019. *Basic Immunology*, 4th ed. Philadelphia. Abbott. 2020. NycoCard CRP REF 1116807. Abbott Diagnostics Technologies AS.
- Açıksarı, G., Koçak, M., Çağ, Y., Altunal, L.N., Atıcı, A., Çelik, F.B., Bölen, F., Açıksarı, K., Çalışkan, M., 2021. Prognostic Value of Inflammatory Biomarkers in Patients with Severe COVID-19: A Single-Center Retrospective Study. *Biomark Insights* 16. 15-19
- Aksel, G., İslam, M.M., Algın, A., Eroğlu, S.E., Yaşar, G.B., Ademoğlu, E., Dölek, Ü.C., 2021. Early predictors of mortality for moderate to severely ill patients with Covid-19. *Am J Emerg Med* 45, 290–296.
- Aziz, M., Fatima, R., Lee-Smith, W., Assaly, R., 2020. The association of low serum albumin level with severe COVID-19: A systematic review and meta-analysis. *Crit Care* 24, 1–4.
- Bertini, P., Guarracino, F., Falcone, M., Nardelli, P., Landoni, G., Nocci, M., Paternoster, G., 2022. ECMO in COVID-19 Patients: A Systematic Review and Meta-analysis. *J Cardiothorac Vasc Anesth*.
- Bhaskar, S., Sinha, A., Banach, M., Mittoo, S., Weissert, R., Kass, J.S., Rajagopal, S., Pai, A.R., Kutty, S., 2020. Cytokine Storm in COVID-19—Immunopathological Mechanisms, Clinical Considerations, and Therapeutic Approaches: The REPROGRAM Consortium Position Paper. *Front Immunol* 11.
- BNPB, 2020. Peta Sebaran Covid di Indonesia [WWW Document]. URL www.Covid.go.id (accessed 9.20.23).
- BNPB, 2023. Badan Nasional Penanggulangan Bencana [WWW Document]. URL <https://covid19.go.id>
- Bonilla-Aldana, D.K., Quintero-Rada, K., Montoya-Posada, J.P., Ramírez-Ocampo, S., Paniz-Mondolfi, A., Rabaan, A.A., Sah, R., Rodríguez-Morales, A.J., 2020. SARS-CoV, MERS-CoV and now the 2019-novel CoV: Have we investigated enough about coronaviruses? – A bibliometric analysis. *Travel Med Infect Dis* 33, 101566.
- Brock, J.H., 2018. Iron and the Immune System. *Proc Nutr Soc*, 161–178.
- Braig, D., Nero, T.L., Koch, H.-G., Kaiser, B., Wang, X., Thiele, J.R., Morton, C.J., Zeller, J., Kiefer, J., Potempa, L.A., Mellett, N.A., Miles, L.A., Du, X.-J., Meikle, P.J., Huber-Lang, M., Stark, G.B., Parker, M.W., Peter, K., Eisenhardt, S.U., 2017. Transitional changes in the CRP structure lead to the exposure of proinflammatory binding sites. *Nat Commun* 8, 14188.
- Burhan, E., Dwi Susanto, A., Isbaniah, F., Aman Nasution, S., Ginanjar, E., Wicaksono Pitoyo, C., *et al.*, 2020. PEDOMAN TATALAKSANA COVID-19 Edisi 3 TIM EDITOR Perhimpunan Dokter Paru Indonesia (PDPI) Perhimpunan Dokter Spesialis Kardiovaskular Indonesia (PERKI) Perhimpunan Dokter Spesialis Penyakit Dalam Indonesia (PAPDI) Perhimpunan Dokter Anestesiologi dan Terapi Intensif Indonesia (PERDATIN) Ikatan Dokter Anak Indonesia (IDAI).
- Carlos, W.G., Cruz, C.S. Dela, Cao, B., Pasnick, S., Jamil, S., 2020. COVID-19 Disease due to SARS-CoV-2 (Novel Coronavirus). *Am J Respir Crit Care Med* 201, P7–P8.
- Cevik, M., Kuppalli, K., Kindrachuk, J., Peiris, M., 2020. Virology, transmission, and pathogenesis of SARS-CoV-2. *BMJ*.

- Channappanavar, R., Fehr, A.R., Vijay, R., Mack, M., Zhao, J., Meyerholz, D.K., Perlman, S., 2016. Dysregulated Type I Interferon and Inflammatory Monocyte-Macrophage Responses Cause Lethal Pneumonia in SARS-CoV-Infected Mice. *Cell Host Microbe* 19, 181–193.
- Chen, N., Zhou, M., Dong, X., Qu, J., Gong, F., Han, Y., Qiu, Y., Wang, J., Liu, Y., Wei, Y., Xia, J., Yu, T., Zhang, X., Zhang, L., 2020. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *The Lancet* 395, 507–513.
- Du, R.-H., Liu, L.-M., Yin, W., Wang, W., Guan, L.-L., Yuan, M.-L., Li, Y.-L., Hu, Y., Li, X.-Y., Sun, B., Peng, P., Shi, H.-Z., 2020. Hospitalization and Critical Care of 109 Decedents with COVID-19 Pneumonia in Wuhan, China. *Ann Am Thorac Soc* 17, 839–846.
- El-Shabrawy, M., Alsadik, M.E., El-Shafei, M., Abdelmoaty, A.A., Alazzouni, A.S., Esawy, M.M., Shabana, M.A., 2021. Interleukin-6 and C-reactive protein/albumin ratio as predictors of COVID-19 severity and mortality. *Egypt J Bronchol* 15, 1.
- Famous, K.R., Delucchi, K., Ware, L.B., Liu, K.D., Thompson, T.B., Calfee, C.S., 2016. ARDS Subphenotypes Respond Differently to Randomized Fluid Management Strategy Running title : Response to Fluid Management Strategy by ARDS Subphenotype Authors and Affiliations : *Am J Respi. Crit*, 1–49.
- Gallo, G., Volpe, M., Savoia, C., 2022. Endothelial Dysfunction in Hypertension: Current Concepts and Clinical Implications. *Front Med (Lausanne)* 8.
- Gálvez-Barrón, C., Arroyo-Huidobro, M., Miñarro, A., Añaños, G., Chamero, A., Martín, M., Gris, C., Avalos, J.L., Capielo, A.M., Ventosa, E., Tremosa, G., Rodríguez-Molinero, A., 2022. COVID-19: Clinical Presentation and Prognostic Factors of Severe Disease and Mortality in the Oldest-Old Population: A Cohort Study. *Gerontology* 68, 30–43.
- Ganji, A., Farahani, I., Khansarinejad, B., Ghazavi, A., Mosayebi, G., 2020. Increased expression of CD8 marker on T-cells in COVID-19 patients. *Blood Cells Mol Dis* 83.
- Hart, P.C., Rajab, I.M., Alebraheem, M., Potempa, L.A., 2020. C-Reactive Protein and Cancer—Diagnostic and Therapeutic Insights. *Front Immunol* 11.
- Haryati, H., Arganita, F.R., Isa, M., Assagaf, A., Suhartono, E., Muhammad, N., 2023. CRP-Albumin Ratio Predicts in Hospital Survival of Infected COVID-19 Patient: Study in South Kalimantan, Indonesia. *J. Hunan Univ. Nat. Sci*, 50.
- Hocanlı, İ., Kabak, M., 2022. CLINICAL IMPORTANCE OF C-REACTIVE PROTEIN TO ALBUMIN RATIO (CAR) IN COVID-19 PNEUMONIA. *J Contemp Med* 12, 266–270.
- Huang, W., Li, C., Wang, Z., Wang, H., Zhou, N., Jiang, J., Ni, L., Zhang, X.A., Wang, D.W., 2020. Decreased serum albumin level indicates poor prognosis of COVID-19 patients: hepatic injury analysis from 2,623 hospitalized cases. *Sci China Life Sci* 63, 1678–1687.
- Jose, R.J., Manuel, A., 2020. COVID-19 cytokine storm: the interplay between inflammation and coagulation. *Lancet Respir Med* 8, e46–e47.
- Kalyon, S., Gültop, F., Şimşek, F., Adaş, M., 2021. Relationships of the neutrophil-lymphocyte and CRP-albumin ratios with the duration of hospitalization and fatality in geriatric patients with COVID-19. *J Int Med Res* 49.

- Karakoyun, I., Colak, A., Turken, M., Altin, Z., Arslan, F.D., Iyilikci, V., Yilmaz, N., Kose, S., 2021. Diagnostic utility of C-reactive protein to albumin ratio as an early warning sign in hospitalized severe COVID-19 patients. *Int Immunopharmacol* 91, 107285.
- Katkat, F., Kalyoncuoglu, M., Karahan, S., Ozcan, S., Tasdemir, Z.A., Kucuk, S.H., Karabulut, U., Guner, A., Biter, H.I., Caglar, F.N.T., Okuyan, E., 2022. The Predictive Ability of the C-reactive Protein to Albumin Ratio As A Mortality Predictor in Hospitalized Severe SARS-CoV-2 Infected Patients with Cardiovascular Diseases. *Haseki Tip Bulteni* 60, 152–160.
- Kingsley, A., Jones, V., 2008. Diagnosing wound infection: the use of C-reactive protein.
- Kumar, D., Banerjee, D., 2017. Methods of albumin estimation in clinical biochemistry: Past, present, and future. *Clin. Chim. Acta*.
- Li, L. quan, Huang, Tian, Wang, Yong qing, Wang, Z. ping, Liang, Y., Huang, Tao bi, Zhang, H. yun, Sun, W., Wang, Yuping, 2020. COVID-19 patients' clinical characteristics, discharge rate, and fatality rate of meta-analysis. *J Med Virol* 92, 577–583.
- Li, Y.J., Yao, K., Lu, M.X., Zhang, W.B., Xiao, C., Tu, C.Q., 2017. Prognostic value of the C-reactive protein to albumin ratio: A novel inflammation-based prognostic indicator in osteosarcoma. *Onco Targets Ther* 10, 5255–5261.
- Matsuoka, H., Ando, K., Hu, Q., Zaitzu, Y., Tsuda, Y., Hisamatsu, Y., Nakashima, Y., Kimura, Y., Oki, E., Mori, M., 2020. Postoperative C-reactive protein/albumin ratio is a biomarker of risk of recurrence and need for adjuvant chemotherapy for stage III colorectal cancer. *Int J Clin Oncol* 25, 1318–1326.
- Mazzaferro, E.M., Edwards, T., 2020. Update on Albumin Therapy in Critical Illness. *Vet Clin North Am Small Anim Pract* 50, 1289–1305.
- Mo, H., Zeng, G., Ren, X., Li, H., Ke, C., Tan, Y., Cai, C., Lai, K., Chen, R., Chan-Yeung, M., Zhong, N., 2006. Longitudinal profile of antibodies against SARS-coronavirus in SARS patients and their clinical significance. *Respirology* 11, 49–53.
- Moon, J.S., Ahn, S.S., Park, Y.B., Lee, S.K., Lee, S.W., 2018. C-reactive protein to serum albumin ratio is an independent predictor of all-cause mortality in patients with ANCA-associated vasculitis. *Yonsei Med J* 59, 865–871.
- Mosquera-Sulbaran, J.A., Pedrañez, A., Carrero, Y., Callejas, D., 2021. C-reactive protein as an effector molecule in Covid-19 pathogenesis. *Rev Med Virol*.
- Mubarik, S., Liu, X., Eshak, E.S., Liu, K., Liu, Q., 2021. The Association of Hypertension With the Severity of and Mortality From the COVID-19 in the Early Stage of the Epidemic in Wuhan , China : A Multicenter Retrospective Cohort Study. *Front Med* 8.
- Nar, R., Emekli, D.I., 2017a. The Evaluation of Analytical Performance of Immunoassay Tests by Using Six-Sigma Method. *J Med Biochem* 36, 301–308.
- Nar, R., Emekli, D.I., 2017b. The Evaluation of Analytical Performance of Immunoassay Tests by Using Six-Sigma Method. *J Med Biochem* 36, 301–308.
- Pepys, M.B., Hirschfield, G.M., 2003. C-reactive protein: A critical update. *J Clin Investig.*

- Ponti, G., Maccaferri, M., Ruini, C., Tomasi, A., Ozben, T., 2020. Biomarkers associated with COVID-19 disease progression. *Crit Rev Clin Lab Sci* 0, 389–399.
- Promptchara, E., Ketloy, C., Palaga, T., 2020. Immune responses in COVID-19 and potential vaccines: Lessons learned from SARS and MERS epidemic. *Asian Pac J Allergy Immunol* 38, 1–9.
- Pyzdek, T., 2009. The Six Sigma handbook chapter 1, Search.
- Rabbani, G., Ahn, S.N., 2019. Structure, enzymatic activities, glycation and therapeutic potential of human serum albumin: A natural cargo. *Int J Biol Macromol* 123, 979–990.
- Roche. 2021. Cobas CRP4. *Roche Diagnostic*. Roche Diagnostic.
- Sanyaolu, A., Okorie, C., Marinkovic, A., Patidar, R., Younis, K., Desai, P., 2020. Comorbidity and its Impact on Patients with COVID-19. *SN Compr Clin Med*.
- Saylik, F., Akbulut, T., Kaya, S., 2021. Can C-Reactive Protein to Albumin Ratio Predict In-Hospital Death Rate Due to COVID-19 in Patients With Hypertension? *Angiology* 72, 947–952.
- Sert, O.Z., Bozkurt, H., Olmez, T., Aray, E., Uzun, O., Gulmez, S., Zenger, A.S., Polat, E.,
- Sharifpour, M., Rangaraju, S., Liu, M., Alabyad, D., Nahab, F.B., Creel-Bulos, C.M., Jabaley, C.S., 2020. C-Reactive protein as a prognostic indicator in hospitalized patients with COVID-19. *PLoS One* 15, e0242400.
- Sproston, N.R., Ashworth, J.J., 2018b. Role of C-reactive protein at sites of inflammation and infection. *Front Immunol*.
- Duman, M., 2021. C-Reactive Protein to Albumin Ratio: A Reliable Marker in Colorectal Cancer. *Turk J Colorectal Dis* 31, 35–42.
- Shi, Y., Wang, Y., Shao, C., Huang, J., Gan, J., Huang, X., Bucci, E., Piacentini, M., Ippolito, G., Melino, G., 2020. COVID-19 infection: the perspectives on immune responses. *Cell Death Differ* 27:5 27, 1451–1454.
- Sproston, N.R., Ashworth, J.J., 2018. Role of C-reactive protein at sites of inflammation and infection. *Front Immunol* 9, 1–11.
- Surat Edaran Kasatgas Nomor 1 Tahun 2023 | Covid19.go.id [WWW Document], n.d. URL <https://covid19.go.id/artikel/2023/06/09/surat-edaran-kasatgas-nomor-1-tahun-2023> (accessed 10.10.23).
- Tan, C., Huang, Y., Shi, F., Tan, K., Ma, Q., Chen, Y., Jiang, X., Li, X., 2020. C-reactive protein correlates with computed tomographic findings and predicts severe COVID-19 early. *J Med Virol* 92, 856–862.
- Tay, M.Z., Poh, C.M., Rénia, L., MacAry, P.A., Ng, L.F.P., 2020. The trinity of COVID-19: immunity, inflammation and intervention. *Nat Rev Immunol* 20:6 20, 363–374.
- Turgeon, M. 2018. *Immunology and serology in laboratory medicine*. Seventh edition. Missouri: Elsevier.
- Uzum, Y., Turkkan, E., 2023. Predictivity of CRP, Albumin, and CRP to Albumin Ratio on the Development of Intensive Care Requirement, Mortality, and Disease Severity in COVID-19. *Cureus*.
- Valle, D.M., Kim-Schulze, S., Huang, H.H., Beckmann, N.D., Nirenberg, S., Wang, B., Lavin, Y., Swartz, *et al*, 2020. An inflammatory cytokine signature predicts COVID-19 severity and survival. *Nat Med* 26, 1636–1643.

- Wang, Tang, Wei, 2020. Updated understanding of the outbreak of 2019 novel coronavirus (2019-nCoV) in Wuhan, China. *J Med Virol* 92, 441–447.
- WHO, 2020. Naming the coronavirus disease (COVID-19) and the virus that causes it.
- WHO, 2023. WHO coronavirus (COVID-19) dashboard [WWW Document]. *WHO coronavirus (COVID-19) dashboard*. URL <https://covid19.who.int/>
- Wolff, D., Nee, S., Hickey, N.S., Marschollek, M., 2021. Risk factors for Covid-19 severity and fatality: a structured literature review. *Infection* 49, 15–28.
- Wu, F., Wang, A., Liu, M., Wang, Q., Chen, J., Xia, S., Ling, Y., Xun, J., Lu, L., Jiang, S., Lu, H., Wen, Y., Huang, J., 2020. Neutralizing Antibody Responses to SARS-CoV-2 in a COVID-19 Recovered Patient Cohort and Their Implications. *SSRN Electronic Journal*.
- Yamamoto, T., Kawada, K., Obama, K., 2021. Inflammation-Related Biomarkers for the Prediction of Prognosis in Colorectal Cancer Patients. *Int J Mol Sci* 22, 8002.
- Yang, A.-P., Liu, J., Tao, W., Li, H., 2020. The diagnostic and predictive role of NLR, d-NLR and PLR in COVID-19 patients. *Int Immunopharmacol* 84, 106504.
- Zavalaga-Zegarra, H.J., Palomino-Gutierrez, J.J., Ulloque-Badaracco, J.R., Mosquera-Rojas, M.D., Hernandez-Bustamante, E.A., Alarcon-Braga, E.A., Benites-Zapata, V.A., Herrera-Añazco, P., Hernandez, A. V., 2022. C-Reactive Protein-to-Albumin Ratio and Clinical Outcomes in COVID-19 Patients: A Systematic Review and Meta-Analysis. *Trop Med Infect Dis* 7, 1–14.
- Zhao, Y., Zhao, Z., Wang, Y., Zhou, Y., Ma, Y., Zuo, W., 2020. Single-Cell RNA Expression Profiling of ACE2, the Receptor of SARS-CoV-2. *Am J Respir Crit Care Med* 202, 756–759.
- Zhou, Q., Li, X., 2019. C-Reactive Protein to Albumin Ratio in Colorectal Cancer: A Meta- Analysis of Prognostic Value. *Dose-Response* 17.