

DAFTAR PUSTAKA

- Abuyousef, S., Alnaimi, S., Omar, N.E., Elajez, R., Elmekaty, E., Abdelfattah-Arafa, E., dkk., 2024. Early predictors of intensive care unit admission among COVID-19 patients in Qatar. *Frontiers in Public Health*, **12**: .
- Al Omair, O.A., Essa, A., Elzorkany, K., Shehab-Eldeen, S., Alarfaj, H.M., Alarfaj, S.M., dkk., 2023a. Factors Affecting Hospitalization Length and in-Hospital Death Due to COVID-19 Infection in Saudi Arabia: A Single-Center Retrospective Analysis. *International Journal of General Medicine*, **16**: 3267–3280.
- Al Omair, O.A., Essa, A., Elzorkany, K., Shehab-Eldeen, S., Alarfaj, H.M., Alarfaj, S.M., dkk., 2023b. Factors Affecting Hospitalization Length and in-Hospital Death Due to COVID-19 Infection in Saudi Arabia: A Single-Center Retrospective Analysis. *International Journal of General Medicine*, **16**: 3267–3280.
- AlKhafaji, D., Al Argan, R., Albahrani, S., Al Elq, A., Albaker, W., Al-Hariri, M., dkk., 2022. The impact of obesity on hospitalized patients with COVID-19 infection in the Eastern Province of Saudi Arabia. *Journal of Medicine and Life*, **15**: 425–432.
- Alrashed, A.A., 2021. Severity of COVID-19 infection in ACEI/ARB users in specialty hospitals: A retrospective cohort study. *Journal of Infection and Public Health*, **14**: 726–733.
- Altunkaya, J., Piernas, C., Pouwels, K.B., Jebb, S.A., Clarke, P., Astbury, N.M., dkk., 2024. Associations between BMI and hospital resource use in patients hospitalised for COVID-19 in England: a community-based cohort study. *The Lancet Diabetes & Endocrinology*, **12**: 462–471.
- Azzolina, D., Comoretto, R., Lanera, C., Berchiolla, P., Baldi, I., dan Gregori, D., 2022. COVID-19 hospitalizations and patients' age at admission: The neglected importance of data variability for containment policies. *Frontiers in Public Health*, **10**: 1002232.
- Badan Penelitian dan Pengembangan Kesehatan Kementerian RI, 2018. Hasil Utama RISKESDAS 2018.
- Bae, J.H., Choi, S.K., Kim, N.H., Lee, J., dan Kim, S.G., 2021. Use of Renin-Angiotensin-Aldosterone System Inhibitors and Severe COVID-19 Outcomes in Patients with Hypertension: A Nationwide Cohort Study. *Diabetes & Metabolism Journal*, **45**: 430–438.
- Baksh, M., Ravat, V., Zaidi, A., dan Patel, R.S., 2020. A Systematic Review of Cases of Acute Respiratory Distress Syndrome in the Coronavirus Disease 2019 Pandemic. *Cureus*, **12**: e8188.
- Baslilar, S. dan Saylan, B., 2021. Patients with hypertension hospitalized with COVID-19 pneumonia using angiotensinconverting enzyme inhibitors and angiotensin II receptor blockers or other antihypertensives: retrospective analysis of 435 patients. *Annals of Saudi medicine*, **41**: 268–273.
- Batiha, G.E.-S., Gari, A., Elshony, N., Shaheen, H.M., Abubakar, M.B., Adeyemi, S.B., dkk., 2021. Hypertension and its management in COVID-19 patients:

- The assorted view. *International Journal of Cardiology Cardiovascular Risk and Prevention*, **11**: 200121.
- Battistoni, A., Michielon, A., Marino, G., dan Savoia, C., 2020. Vascular Aging and Central Aortic Blood Pressure: From Pathophysiology to Treatment. *High Blood Pressure & Cardiovascular Prevention: The Official Journal of the Italian Society of Hypertension*, **27**: 299–308.
- Bauer, A.Z., Gore, R., Sama, S.R., Rosiello, R., Garber, L., Sundaresan, D., dkk., 2021. Hypertension, medications, and risk of severe COVID-19: A Massachusetts community-based observational study. *Journal of Clinical Hypertension (Greenwich, Conn.)*, **23**: 21–27.
- Bellani, G., Laffey, J.G., Pham, T., Fan, E., Brochard, L., Esteban, A., dkk., 2016. Epidemiology, Patterns of Care, and Mortality for Patients With Acute Respiratory Distress Syndrome in Intensive Care Units in 50 Countries. *JAMA*, **315**: 788–800.
- Bestari, M.G., Tommy, S., dan Lulu Ayu, N., 2022. Laboratory risk factors for mortality in severe and critical COVID-19 patients admitted to the ICU. F1000Research.
- Bozkurt, B., Kovacs, R., dan Harrington, B., 2020. Joint HFSA/ACC/AHA Statement Addresses Concerns Re: Using RAAS Antagonists in COVID-19. *Journal of Cardiac Failure*, **26**: 370.
- Braude, P., Carter, B., Short, R., Vilches-Moraga, A., Verduri, A., Pearce, L., dkk., 2020. The influence of ACE inhibitors and ARBs on hospital length of stay and survival in people with COVID-19. *International Journal of Cardiology. Heart & Vasculature*, **31**: 100660.
- Broadbudd, V., Ernst, J., King, T., Lazarus, S., Sarmiento, K., et al., 2021. 'Murray & Nadel's Textbook of Respiratory Medicine, 2-Volume Set - 7th Edition', . URL: <https://shop.elsevier.com/books/murray-and-nadels-textbook-of-respiratory-medicine-2-volume-set/broadbudd/978-0-323-65587-3> (diakses tanggal 27/8/2023).
- Burhan, E., Susanto, A.D., Nasution, S.A., Ginanjar, E., Pitoyo, W., Susilo, A., dkk., n.d. 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 176.
- Burhan, E., Susanto, A.D., Nasution, S.A., Ginanjar, E., Pitoyo, W., Susilo, A., dkk., n.d. Pedoman Tatalaksana COVID-19 Edisi-4. *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)*, .
- Butler, M.J., Best, J.H., Mohan, S.V., Jonas, J.A., Arader, L., dan Yeh, J., 2023. Mechanical ventilation for COVID-19: Outcomes following discharge from inpatient treatment. *PLOS ONE*, **18**: .
- Caillon, A., Zhao, K., Klein, K.O., Greenwood, C.M.T., Lu, Z., Paradis, P., dkk., 2021. High Systolic Blood Pressure at Hospital Admission Is an Important

- Risk Factor in Models Predicting Outcome of COVID-19 Patients. *American Journal of Hypertension*, **34**: 282–290.
- Cao, B., Wang, Y., Wen, D., Liu, W., Wang, J., Fan, G., dkk., 2020. A Trial of Lopinavir-Ritonavir in Adults Hospitalized with Severe Covid-19. *The New England Journal of Medicine*, **382**: 1787–1799.
- CDC. 2020. Interim clinical guidance for management of patients with confirmed coronavirus disease (COVID-19). Accessed: April 18, 2020: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidancemanagement-patients.html>.
- Chan, J.F.-W., Kok, K.-H., Zhu, Z., Chu, H., To, K.K.-W., Yuan, S., dkk., 2020. Genomic characterization of the 2019 novel human-pathogenic coronavirus isolated from a patient with atypical pneumonia after visiting Wuhan. *Emerging Microbes & Infections*, **9**: 221–236.
- Channappanavar, R., Fett, C., Mack, M., Ten Eyck, P.P., Meyerholz, D.K., dan Perlman, S., 2017. Sex-Based Differences in Susceptibility to Severe Acute Respiratory Syndrome Coronavirus Infection. *Journal of Immunology (Baltimore, Md.: 1950)*, **198**: 4046–4053.
- Chatterjee, S., Nalla, L.V., Sharma, M., Sharma, N., Singh, A.A., Malim, F.M., dkk., 2023. Association of COVID-19 with Comorbidities: An Update. *ACS Pharmacology & Translational Science*, **6**: 334–354.
- Chaturvedi, R., Lui, B., Aaronson, J.A., White, R.S., dan Samuels, J.D., n.d. COVID-19 complications in males and females: recent developments. *Journal of Comparative Effectiveness Research*, **11**: 689–698.
- Chen, G., 2020. Clinical and immunological features of severe and moderate coronavirus disease 2019. *Journal of Clinical Investigation*, **130**: 2620–2629.
- Chen, L., Chen, J., Wu, Y., Zhong, J., Zhou, F., Liu, Y., dkk., 2021. Clinical Characteristics and Outcomes of Hypertensive Patients Infected with COVID-19: A Retrospective Study. *International Journal of General Medicine*, **Volume 14**: 4619–4628.
- Chen, R., Yang, J., Gao, X., Ding, X., Yang, Y., Shen, Y., dkk., 2020. Influence of blood pressure control and application of renin-angiotensin-aldosterone system inhibitors on the outcomes in COVID-19 patients with hypertension. *The Journal of Clinical Hypertension*, **22**: 1974–1983.
- Chen, T., Wu, D., Chen, H., Yan, W., Yang, D., Chen, G., dkk., 2020. Clinical characteristics of 113 deceased patients with coronavirus disease 2019: retrospective study. *BMJ*, **368**: m1091.
- Choksi, T.T., 2021. Outcomes of Hospitalized COVID-19 Patients Receiving Renin Angiotensin System Blockers and Calcium Channel Blockers. *American Journal of Nephrology*, **52**: 250–260.
- Cure, E. dan Cumhur Cure, M., 2020. Angiotensin-converting enzyme inhibitors and angiotensin receptor blockers may be harmful in patients with diabetes during COVID-19 pandemic. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, **14**: 349–350.

- Dana, R., Bannay, A., Bourst, P., Ziegler, C., Losser, M.-R., Gibot, S., dkk., 2021. Obesity and mortality in critically ill COVID-19 patients with respiratory failure. *International Journal of Obesity*, **45**: 2028–2037.
- Dinas Kesehatan Kota Yogyakarta, 2023. 'Profil Kesehatan Kota Yogyakarta 2023', . URL: <https://kesehatan.jogjakota.go.id/berita/id/470/profil-kesehatan-kota-yogyakarta-tahun-2023/> (diakses tanggal 31/8/2023).
- DiPiro, J.T., Yee, G.C., dan Posey, L.M., 2020. *Pharmacotherapy: A Pathophysiologic Approach, Eleventh Edition*, 11th edition. ed. McGraw Hill / Medical.
- Docherty, A.B., 2020. Features of 20 133 UK patients in hospital with covid-19 using the ISARIC WHO Clinical Characterisation Protocol: Prospective observational cohort study. *The BMJ*, **369**: .
- EMA, 2020. 'Coronavirus disease (COVID-19)', , *Text, European Medicines Agency*. URL: <https://www.ema.europa.eu/en/human-regulatory/overview/public-health-threats/coronavirus-disease-covid-19> (diakses tanggal 14/2/2022).
- Faes, C., S, A., D, V.B., G, M., E, V., dan N, H., 2020. Time between Symptom Onset, Hospitalisation and Recovery or Death: Statistical Analysis of Belgian COVID-19 Patients. *International journal of environmental research and public health*, **17**: .
- Fang, L., Karakiulakis, G., dan Roth, M., 2020. Are patients with hypertension and diabetes mellitus at increased risk for COVID-19 infection? *The Lancet. Respiratory Medicine*, **8**: e21.
- Felice, C., Nardin, C., Di Tanna, G.L., Grossi, U., Bernardi, E., Scaldaferri, L., dkk., 2020. Use of RAAS inhibitors and risk of clinical deterioration in COVID-19: results from an Italian cohort of 133 hypertensives. *American Journal of Hypertension*, hpa096.
- Fernández-Ruiz, I., 2020. RAAS inhibitors do not increase the risk of COVID-19. *Nature Reviews. Cardiology*, **17**: 383.
- Faes, C., Abrams, S., Van Beckhoven, D., Meyfroidt, G., Vlieghe, E., Hens, N., dkk., 2020. Time between Symptom Onset, Hospitalisation and Recovery or Death: Statistical Analysis of Belgian COVID-19 Patients. *International Journal of Environmental Research and Public Health*, **17**: 7560.
- Fosbøl, E.L., Butt, J.H., Østergaard, L., Andersson, C., Selmer, C., Kragholm, K., dkk., 2020a. Association of Angiotensin-Converting Enzyme Inhibitor or Angiotensin Receptor Blocker Use With COVID-19 Diagnosis and Mortality. *JAMA*, **324**: 168–177.
- Fosbøl, E.L., Butt, J.H., Østergaard, L., Andersson, C., Selmer, C., Kragholm, K., dkk., 2020b. Association of Angiotensin-Converting Enzyme Inhibitor or Angiotensin Receptor Blocker Use With COVID-19 Diagnosis and Mortality. *JAMA*, **324**: 168–177.
- Gallo, G., Calvez, V., dan Savoia, C., 2022. Hypertension and COVID-19: Current Evidence and Perspectives. *High Blood Pressure & Cardiovascular Prevention*, **29**: 115–123.
- Gao, C., Cai, Y., Zhang, K., Zhou, L., Zhang, Y., Zhang, X., dkk., 2020. Association of hypertension and antihypertensive treatment with COVID-

- 19 mortality: a retrospective observational study. *European Heart Journal*, **41**: 2058–2066.
- Gao, Y.-D., Ding, M., Dong, X., Zhang, J.-J., Kursat Azkur, A., Azkur, D., dkk., 2021. Risk factors for severe and critically ill COVID-19 patients: A review. *Allergy*, **76**: 428–455.
- García-Posada, M., Aruachan-Vesga, S., Mestra, D., Humánez, K., Serrano-Coll, H., Cabrales, H., dkk., 2021. Clinical outcomes of patients hospitalized for COVID-19 and evidence-based on the pharmacological management reduce mortality in a region of the Colombian Caribbean. *Journal of Infection and Public Health*, **14**: 696–701.
- Gebhard, C.E., Hamouda, N., Gebert, P., Regitz-Zagrosek, V., Gebhard, C., Bengs, S., dkk., 2022. Sex versus gender-related characteristics: which predicts clinical outcomes of acute COVID-19? *Intensive Care Medicine*, **48**: 1652–1655.
- Gomez, J.M.D., Du-Fay-de-Lavallaz, J.M., Fugar, S., Sarau, A., Simmons, J.A., Clark, B., dkk., 2021. Sex Differences in COVID-19 Hospitalization and Mortality. *Journal of Women's Health (2002)*, **30**: 646–653.
- Gong, J., Sun, Y., dan Xie, L., 2021. ACEI/ARB Drug Therapy in COVID-19 Patients: Yes Or No? *Journal of Translational Internal Medicine*, **9**: 8–11.
- Goyal, P., 2020. Clinical characteristics of COVID-19 in New York City. *New England Journal of Medicine*, **382**: 2372–2374.
- Grasselli, G., Greco, M., Zanella, A., Albano, G., Antonelli, M., Bellani, G., dkk., 2020. Risk Factors Associated With Mortality Among Patients With COVID-19 in Intensive Care Units in Lombardy, Italy. *JAMA internal medicine*, **180**: 1345–1355.
- Guo, T., Fan, Y., Chen, M., Wu, X., Zhang, L., He, T., dkk., 2020. Cardiovascular Implications of Fatal Outcomes of Patients With Coronavirus Disease 2019 (COVID-19). *JAMA cardiology*, **5**: 811–818.
- Hakeam, H.A., 2021. Association of Angiotensin-Converting Enzyme Inhibitors and Angiotensin II Blockers With Severity of COVID-19: A Multicenter, Prospective Study. *Journal of Cardiovascular Pharmacology and Therapeutics*, **26**: 244–252.
- Hamada, S., Suzuki, T., Tokuda, Y., Taniguchi, K., dan Shibuya, K., 2023. Comparing clinical outcomes of ARB and ACEi in patients hospitalized for acute COVID-19. *Scientific Reports*, **13**: 11810.
- Hayden, M.R., 2020. Endothelial activation and dysfunction in metabolic syndrome, type 2 diabetes and coronavirus disease 2019. *The Journal of International Medical Research*, **48**: 300060520939746.
- Herrmann, J., Adam, E.H., Notz, Q., Helmer, P., Sonntagbauer, M., Ungemach-Papenberg, P., dkk., 2020. COVID-19 Induced Acute Respiratory Distress Syndrome—A Multicenter Observational Study. *Frontiers in Medicine*, **7**: 1–10.
- Hippisley-Cox, J., Young, D., Coupland, C., Channon, K.M., Tan, P.S., Harrison, D.A., dkk., 2020. Risk of severe COVID-19 disease with ACE inhibitors and angiotensin receptor blockers: cohort study including 8.3 million people. *Heart (British Cardiac Society)*, **106**: 1503–1511.

- Ho, C. dan Lee, P.-C., 2022. COVID-19 Treatment—Current Status, Advances, and Gap. *Pathogens*, **11**: 1201.
- Huang, C., Wang, Y., Li, X., Ren, L., Zhao, J., Hu, Y., dkk., 2020. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet (London, England)*, **395**: 497–506.
- Huang, Z., Cao, J., Yao, Y., Jin, X., Luo, Z., Xue, Y., dkk., 2020. The effect of RAS blockers on the clinical characteristics of COVID-19 patients with hypertension. *Annals of Translational Medicine*, **8**: 430.
- Hur, K., Price, C.P.E., Gray, E.L., Gulati, R.K., Maksimoski, M., Racette, S.D., dkk., 2020. Factors Associated With Intubation and Prolonged Intubation in Hospitalized Patients With COVID-19. *Otolaryngology--Head and Neck Surgery: Official Journal of American Academy of Otolaryngology-Head and Neck Surgery*, **163**: 170–178.
- Iaccarino, G., 2020. Age and multimorbidity predict death among COVID-19 Patients: Results of the SARS-RAS study of the Italian society of hypertension. *Hypertension*, **76**: .
- Iaccarino, G., Grassi, G., Borghi, C., Carugo, S., Fallo, F., Ferri, C., dkk., 2020. Gender differences in predictors of intensive care units admission among COVID-19 patients: The results of the SARS-RAS study of the Italian Society of Hypertension. *PloS One*, **15**: e0237297.
- Jackson, B.R., 2021. Predictors at Admission of Mechanical Ventilation and Death in an Observational Cohort of Adults Hospitalized with Coronavirus Disease 2019. *Clinical Infectious Diseases*, **73**: .
- Jeffery, M.M., Cummins, N.W., Dempsey, T.M., Limper, A.H., Shah, N.D., dan Bellolio, F., 2021. Association of outpatient ACE inhibitors and angiotensin receptor blockers and outcomes of acute respiratory illness: a retrospective cohort study. *BMJ Open*, **11**: e044010.
- Jung, S.-Y., Choi, J.C., You, S.-H., dan Kim, W.-Y., 2020. Association of Renin-angiotensin-aldosterone System Inhibitors With Coronavirus Disease 2019 (COVID-19)- Related Outcomes in Korea: A Nationwide Population-based Cohort Study. *Clinical Infectious Diseases: An Official Publication of the Infectious Diseases Society of America*, **71**: 2121–2128.
- Kabia, A.U., 2022. The effects of hypertension on the prognosis of coronavirus disease 2019: a systematic review and meta-analysis on the interactions with age and antihypertensive treatment. *Journal of Hypertension*, **40**: 2323–2336.
- Kämpe, J., Bohlin, O., Jonsson, M., Hofmann, R., Hollenberg, J., Wahlin, R.R., dkk., 2023. Risk factors for severe COVID-19 in the young—before and after ICU admission. *Annals of Intensive Care*, **13**: 31.
- Kamyshnyi, A., Krynytska, I., Matskevych, V., Marushchak, M., dan Lushchak, O., 2020. Arterial Hypertension as a Risk Comorbidity Associated with COVID-19 Pathology. *International Journal of Hypertension*, **2020**: 8019360.
- Kemenkes RI, 2023. 'Peta Sebaran', . URL: <https://covid19.go.id/id/peta-sebaran> (diakses tanggal 8/8/2023).

- Kuba, K., Imai, Y., Rao, S., Gao, H., Guo, F., Guan, B., dkk., 2005. A crucial role of angiotensin converting enzyme 2 (ACE2) in SARS coronavirus-induced lung injury. *Nature Medicine*, **11**: 875–879.
- Kulkarni, S., Jenner, B.L., dan Wilkinson, I., 2020. COVID-19 and hypertension. *Journal of the Renin-Angiotensin-Aldosterone System*, **21**: 1470320320927851.
- Kumar, S., 2022. Safety of ACEi and ARB in COVID-19 management: A retrospective analysis. *Clinical Cardiology*, **45**: 759–766.
- Kumar, S., Nikraves, M., Chukwuemeka, U., Randazzo, M., Flores, P., Choday, P., dkk., 2022. Safety of ACEi and ARB in COVID-19 management: A retrospective analysis. *Clinical Cardiology*, **45**: 759–766.
- Lafaurie, M., Martin-Blondel, G., Delobel, P., Charpentier, S., Sommet, A., dan Moulis, G., 2021a. Outcome of patients hospitalized for COVID-19 and exposure to angiotensin-converting enzyme inhibitors and angiotensin-receptor blockers in France: results of the ACE-CoV study. *Fundamental & Clinical Pharmacology*, **35**: 194–203.
- Lee, I.T., Nakayama, T., Wu, C.-T., Goltsev, Y., Jiang, S., Gall, P.A., dkk., 2020. ACE2 localizes to the respiratory cilia and is not increased by ACE inhibitors or ARBs. *Nature Communications*, **11**: 5453.
- Lee, K.-Y., 2015. A Common Immunopathogenesis Mechanism for Infectious Diseases: The Protein-Homeostasis-System Hypothesis. *Infection & Chemotherapy*, **47**: 12–26.
- Lescure, F.-X., Bouadma, L., Nguyen, D., Parisey, M., Wicky, P.-H., Behillil, S., dkk., 2020. Clinical and virological data of the first cases of COVID-19 in Europe: a case series. *The Lancet. Infectious Diseases*, **20**: 697–706.
- Lewnard, J.A., Liu, V.X., Jackson, M.L., Schmidt, M.A., Jewell, B.L., Flores, J.P., dkk., 2020. Incidence, clinical outcomes, and transmission dynamics of severe coronavirus disease 2019 in California and Washington: prospective cohort study. *BMJ*, m1923.
- Li, G., Hu, R., dan Zhang, X., 2020. Antihypertensive treatment with ACEI/ARB of patients with COVID-19 complicated by hypertension. *Hypertension Research*, 1–3.
- Li, J., Wang, X., Chen, J., Zhang, H., dan Deng, A., 2020. Association of Renin-Angiotensin System Inhibitors With Severity or Risk of Death in Patients With Hypertension Hospitalized for Coronavirus Disease 2019 (COVID-19) Infection in Wuhan, China. *JAMA cardiology*, **5**: 825–830.
- Li, M., 2021. The association of COVID-19 occurrence and severity with the use of angiotensin converting enzyme inhibitors or angiotensin-II receptor blockers in patients with hypertension. *PLoS ONE*, **16**: .
- Li, M., Wang, Y., Ndiwane, N., Orner, M., Palacios, N., Mittler, B., dkk., 2021. The association of COVID-19 occurrence and severity with the use of angiotensin converting enzyme inhibitors or angiotensin-II receptor blockers in patients with hypertension. *PLOS ONE*, **16**: e0248652.
- Li, X., 2020. Risk factors for severity and mortality in adult COVID-19 inpatients in Wuhan. *Journal of Allergy and Clinical Immunology*, **146**: 110–118.

- Liabeuf, S., Moragny, J., Bennis, Y., Batteux, B., Brochot, E., Schmit, J.L., dkk., 2021. Association between renin-angiotensin system inhibitors and COVID-19 complications. *Eur Heart J Cardiovasc Pharmacother*, 426–434.
- Liu, X., Zhou, H., Zhou, Y., Wu, X., Zhao, Y., Lu, Y., dkk., 2020. Risk factors associated with disease severity and length of hospital stay in COVID-19 patients. *The Journal of Infection*, **81**: e95–e97.
- Liu, Y., Huang, F., Xu, J., Yang, P., Qin, Y., Cao, M., dkk., 2020. Anti-hypertensive Angiotensin II receptor blockers associated to mitigation of disease severity in elderly COVID-19 patients.
- Long, H., Li, J., Li, R., Zhang, H., Ge, H., Zeng, Hui, dkk., 2022. Plasma glucose levels and diabetes are independent predictors for mortality in patients with COVID-19. *Epidemiology and Infection*, **150**: e106.
- Lukito, A.A. dan Harmeiwaty, E., 2019. Konsensus Penatalaksanaan Hipertensi 2019. *Perhimpunan Dokter Hipertensi Indonesia*, .
- Ma, Y., Zhang, Y., Li, S., Yang, H., Li, H., Cao, Z., dkk., 2021. Sex Differences in Association Between Anti-Hypertensive Medications and Risk of COVID-19 in Middle-Aged and Older Adults. *Drugs & Aging*, **38**: 921–930.
- Ma, Z., 2021. Does taking an angiotensin inhibitor increase the risk for COVID-19? – a systematic review and meta-analysis. *Aging*, **13**: 10853–10865.
- Marfella, R., Paolisso, P., Sardu, C., Bergamaschi, L., D’Angelo, E.C., Barbieri, M., dkk., 2020. Negative impact of hyperglycaemia on tocilizumab therapy in Covid-19 patients. *Diabetes & Metabolism*, **46**: 403–405.
- Mehta, N., 2020. Association of Use of Angiotensin-Converting Enzyme Inhibitors and Angiotensin II Receptor Blockers with Testing Positive for Coronavirus Disease 2019 (COVID-19). *JAMA Cardiology*, **5**: 1020–1026.
- Mehta, N., Kalra, A., Nowacki, A.S., Anjewierden, S., Han, Z., Bhat, P., dkk., 2020. Association of Use of Angiotensin-Converting Enzyme Inhibitors and Angiotensin II Receptor Blockers With Testing Positive for Coronavirus Disease 2019 (COVID-19). *JAMA cardiology*, **5**: 1020–1026.
- Meijs, D.A.M., van Bussel, B.C.T., Stessel, B., Mehagnoul-Schipper, J., Hana, A., Scheeren, C.I.E., dkk., 2022. Better COVID-19 Intensive Care Unit survival in females, independent of age, disease severity, comorbidities, and treatment. *Scientific Reports*, **12**: 734.
- Meng, J., 2020. Renin-angiotensin system inhibitors improve the clinical outcomes of COVID-19 patients with hypertension. *Emerging Microbes and Infections*, **9**: 757–760.
- Meng, J., Xiao, G., Zhang, J., He, X., Ou, M., Bi, J., dkk., 2020. Renin-angiotensin system inhibitors improve the clinical outcomes of COVID-19 patients with hypertension. *Emerging Microbes & Infections*, **9**: 757–760.
- Mirjalili, M., Dehghani, M., Raadabadi, M., Madadzadeh, F., Sharifyazdi, M., Shojaefar, H., dkk., 2023. Factors Associated with Length of Hospital Stays in COVID-19 Patients in Yazd Province Hospitals. *Journal of Health Sciences & Surveillance System*, **11**: 614–619.

- Mollazehi, M. dan Mohammad, M., 2020. '(PDF) Modeling Survival Time to Recovery from COVID-19: A Case Study on Singapore', . URL: https://www.researchgate.net/publication/340292434_Modeling_Survival_Time_to_Recovery_from_COVID-19_A_Case_Study_on_Singapore (diakses tanggal 28/9/2024).
- Moriconi, D., Masi, S., Rebelos, E., Viridis, A., Manca, M.L., De Marco, S., dkk., 2020. Obesity prolongs the hospital stay in patients affected by COVID-19, and may impact on SARS-COV-2 shedding. *Obesity Research & Clinical Practice*, **14**: 205–209.
- Mughal, M.S., Kaur, I.P., Jaffery, A.R., Dalmacion, D.L., Wang, C., Koyoda, S., dkk., 2020. COVID-19 patients in a tertiary US hospital: Assessment of clinical course and predictors of the disease severity. *Respiratory Medicine*, **172**: 106130.
- Najafi, N., 2023. The effect of ACE inhibitors and ARBs on outcomes in hospitalized patients with COVID-19. *Irish Journal of Medical Science*, **192**: 1517–1523.
- Najafi, N., Davoudi, A., Izadyar, H., Alishahi, A., Mokhtariani, A., Soleimanpourian, B., dkk., 2022. The effect of ACE inhibitors and ARBs on outcomes in hospitalized patients with COVID-19. *Irish Journal of Medical Science*, 1–7.
- Negreira-Caamaño, Martin, Piqueras-Flores, J., Martínez-DelRio, J., Nieto-Sandoval-Martin-DeLaSierra, P., Aguila-Gordo, D., Mateo-Gomez, C., dkk., 2020. Impact of Treatment with Renin-Angiotensin System Inhibitors on Clinical Outcomes in Hypertensive Patients Hospitalized with COVID-19. *High blood pressure & cardiovascular prevention: the official journal of the Italian Society of Hypertension*, **27**: 561–568.
- Nemati, H., Ramezani, M., Najafi, F., Sayad, B., Nazeri, M., dan Sadeghi, M., 2020. Evaluation of Angiotensin-converting Enzyme 2 (ACE2) in COVID-19: A Systematic Review on All Types of Studies for Epidemiologic, Diagnostic, and Therapeutic Purposes. *Open Access Macedonian Journal of Medical Sciences*, **8**: 84–91.
- Nguyen, N.T., Chinn, J., De Ferrante, M., Kirby, K.A., Hohmann, S.F., dan Amin, A., 2021. Male gender is a predictor of higher mortality in hospitalized adults with COVID-19. *PloS One*, **16**: e0254066.
- Nouh, M.A., Elgamal, A.A., Ali, H.R., dan Elkhayat, M.M., 2024. Predictors of ICU Admission in Covid 19 Patients. *Afro-Egyptian Journal of Infectious and Endemic Diseases*, **14**: 21–31.
- Nozari, F. dan Hamidizadeh, N., 2022. The Effects of Different Classes of Antihypertensive Drugs on Patients with COVID-19 and Hypertension: A Mini-Review. *International Journal of Hypertension*, **2022**: e5937802.
- Oflar, E., 2022. The Effect of Renin-Angiotensin Blockers on COVID-19 Related Mortality: A Tertiary Center's Experience. *Cor et Vasa*, **64**: 277–281.
- Oussalah, A., Gleye, S., Clerc Urmes, I., Laugel, E., Callet, J., Barbé, F., dkk., 2020. Long-term ACE Inhibitor/ARB Use Is Associated With Severe Renal Dysfunction and Acute Kidney Injury in Patients With Severe COVID-19: Results From a Referral Center Cohort in the Northeast of

- France. *Clinical Infectious Diseases: An Official Publication of the Infectious Diseases Society of America*, **71**: 2447–2456.
- Pan, W., Zhang, J., Wang, M., Ye, J., Xu, Y., Shen, B., dkk., 2020. Clinical Features of COVID-19 in Patients With Essential Hypertension and the Impacts of Renin-angiotensin-aldosterone System Inhibitors on the Prognosis of COVID-19 Patients. *Hypertension*, **76**: 732–741.
- Parasher, A., 2021. COVID-19: Current understanding of its Pathophysiology, Clinical presentation and Treatment. *Postgraduate Medical Journal*, **97**: 312–320.
- Patel, A.B. dan Verma, A., 2020. COVID-19 and Angiotensin-Converting Enzyme Inhibitors and Angiotensin Receptor Blockers: What Is the Evidence? *JAMA*, **323**: 1769–1770.
- Peckham, H., de Grijter, N.M., Raine, C., Radziszewska, A., Ciurtin, C., Wedderburn, L.R., dkk., 2020. Male sex identified by global COVID-19 meta-analysis as a risk factor for death and ITU admission. *Nature Communications*, **11**: 6317.
- PERKI, 2015. Pedoman Tatalaksana Hipertensi pada Penyakit Kardiovaskular.
- Perrotta, M., Lori, A., Carnevale, L., Fardella, S., Cifelli, G., Iacobucci, R., dkk., 2018. Deoxycorticosterone acetate-salt hypertension activates placental growth factor in the spleen to couple sympathetic drive and immune system activation. *Cardiovascular Research*, **114**: 456–467.
- Pfortmueller, C.A., Spinetti, T., Urman, R.D., Luedi, M.M., dan Schefold, J.C., 2021. COVID-19-associated acute respiratory distress syndrome (CARDS): Current knowledge on pathophysiology and ICU treatment – A narrative review. *Best Practice & Research. Clinical Anaesthesiology*, **35**: 351–368.
- Pijls, B.G., Jolani, S., Atherley, A., Derckx, R.T., Dijkstra, J.I.R., Franssen, G.H.L., dkk., 2021. Demographic risk factors for COVID-19 infection, severity, ICU admission and death: a meta-analysis of 59 studies. *BMJ Open*, **11**: e044640.
- Pourbagheri-Sigaroodi, A., Bashash, D., Fateh, F., dan Abolghasemi, H., 2020. Laboratory findings in COVID-19 diagnosis and prognosis. *Clinica Chimica Acta; International Journal of Clinical Chemistry*, **510**: 475–482.
- Pranata, R., 2020. The use of renin angiotensin system inhibitor on mortality in patients with coronavirus disease 2019 (COVID-19): A systematic review and meta-analysis. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, **14**: 983–990.
- Priyatno, Dwi. 2013. Analisis Korelasi, Regresi, dan Multivariate dengan SPSS, Gava Media, Yogyakarta, Indonesia.
- Radzikowska, U., Ding, M., Tan, G., Zhakparov, D., Peng, Y., Wawrzyniak, P., dkk., 2020. Distribution of ACE2, CD147, CD26, and other SARS-CoV-2 associated molecules in tissues and immune cells in health and in asthma, COPD, obesity, hypertension, and COVID-19 risk factors. *Allergy*, **75**: 2829–2845.
- Raimondi, F., Novelli, L., Ghirardi, A., Russo, F.M., Pellegrini, D., Biza, R., dkk., 2021. Covid-19 and gender: lower rate but same mortality of severe

- disease in women—an observational study. *BMC Pulmonary Medicine*, **21**: 96.
- Rajpal, A., Rahimi, L., dan Ismail-Beigi, F., 2020. Factors leading to high morbidity and mortality of COVID -19 in patients with type 2 diabetes. *Journal of Diabetes*, **12**: 895–908.
- Ran, J., Song, Y., Zhuang, Z., Han, L., Zhao, S., Cao, P., dkk., 2020. Blood pressure control and adverse outcomes of COVID-19 infection in patients with concomitant hypertension in Wuhan, China. *Hypertension Research*, **43**: 1267–1276.
- Richardson, S., 2020. Presenting Characteristics, Comorbidities, and Outcomes among 5700 Patients Hospitalized with COVID-19 in the New York City Area. *JAMA - Journal of the American Medical Association*, **323**: 2052–2059.
- Rico-Mesa, J.S., 2020. Outcomes in Patients with COVID-19 Infection Taking ACEI/ARB. *Current Cardiology Reports*, **22**: .
- Rodilla, E., 2021. Impact of Arterial Stiffness on All-Cause Mortality in Patients Hospitalized With COVID-19 in Spain. *Hypertension*, **77**: 856–867.
- Roncon, L., Zuin, M., Rigatelli, G., dan Zuliani, G., 2020. Diabetic patients with COVID-19 infection are at higher risk of ICU admission and poor short-term outcome. *Journal of Clinical Virology: The Official Publication of the Pan American Society for Clinical Virology*, **127**: 104354.
- Rossi, G.P., Sanga, V., dan Barton, M., 2020. Potential harmful effects of discontinuing ACE-inhibitors and ARBs in COVID-19 patients. *eLife*, **9**: e57278.
- Savoia, C., 2021. Hypertension, a moving target in COVID-19: Current views and perspectives. *Circulation Research*, **128**: 1062–1079.
- Semenzato, L., Botton, J., Drouin, J., Cuenot, F., Dray-Spira, R., Weill, A., dkk., 2021. Chronic diseases, health conditions and risk of COVID-19-related hospitalization and in-hospital mortality during the first wave of the epidemic in France: a cohort study of 66 million people. *The Lancet Regional Health. Europe*, **8**: 100158.
- Sharma, R., Kumar, A., Majeed, J., Thakur, A.K., dan Aggarwal, G., 2022. Drugs acting on the renin-angiotensin-aldosterone system (RAAS) and deaths of COVID-19 patients: a systematic review and meta-analysis of observational studies. *The Egyptian heart journal : (EHJ) : official bulletin of the Egyptian Society of Cardiology*, **74**: 64.
- Shimizu, Y., 2020. Understanding the immunopathogenesis of COVID-19: Its implication for therapeutic strategy. *World Journal of Clinical Cases*, **8**: 5835–5843.
- Simonnet, A., Chetboun, M., Poissy, J., Raverdy, V., Noulette, J., Duhamel, A., dkk., 2020. High Prevalence of Obesity in Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) Requiring Invasive Mechanical Ventilation. *Obesity (Silver Spring, Md.)*, **28**: 1195–1199.
- Smits, S.L., Lang, A. de, Brand, J.M.A. van den, Leijten, L.M., IJcken, W.F. van, Eijkemans, M.J.C., dkk., 2010. Exacerbated Innate Host Response to

- SARS-CoV in Aged Non-Human Primates. *PLOS Pathogens*, **6**: e1000756.
- Sommer, P., Lukovic, E., Fagley, E., Long, D.R., Sobol, J.B., Heller, K., dkk., 2020. Initial Clinical Impressions of the Critical Care of COVID-19 Patients in Seattle, New York City, and Chicago. *Anesthesia and Analgesia*, **131**: 55–60.
- South, A.M., Diz, D.I., dan Chappell, M.C., 2020. COVID-19, ACE2, and the cardiovascular consequences. *American Journal of Physiology. Heart and Circulatory Physiology*, **318**: H1084–H1090.
- Sun, X., Wang, T., Cai, D., Hu, Z., Chen, J., Liao, H., dkk., 2020. Cytokine storm intervention in the early stages of COVID-19 pneumonia. *Cytokine & Growth Factor Reviews*, **53**: 38–42.
- Suryantoro, S.D., Thaha, M., Hayati, M.R., Yusuf, M., Pikir, B.S., dan Susilo, H., 2021. Correlation between anti-hypertensive drugs and disease progression among moderate, severe, and critically ill COVID-19 patients in the second referral hospital in Surabaya: A retrospective cohort study.
- Tadic, M., Saeed, S., Grassi, G., Taddei, S., Mancia, G., dan Cuspidi, C., 2021. Hypertension and COVID-19: Ongoing Controversies. *Frontiers in Cardiovascular Medicine*, **8**: .
- Thiruvengadam, G., Lakshmi, M., dan Ramanujam, R., 2021. A Study of Factors Affecting the Length of Hospital Stay of COVID-19 Patients by Cox-Proportional Hazard Model in a South Indian Tertiary Care Hospital. *Journal of Primary Care & Community Health*, **12**: 21501327211000231.
- Tzotzos, S.J., Fischer, B., Fischer, H., dan Zeitlinger, M., 2020. Incidence of ARDS and outcomes in hospitalized patients with COVID-19: a global literature survey. *Critical Care (London, England)*, **24**: 516.
- Ullah, W., Roomi, S., Nadeem, N., Saeed, R., Tariq, S., Ellithi, M., dkk., 2021. Impact of Body Mass Index on COVID-19-Related In-Hospital Outcomes and Mortality. *Journal of Clinical Medicine Research*, **13**: 230–236.
- Viveiros, A., Rasmuson, J., Vu, J., Mulvagh, S.L., Yip, C.Y.Y., Norris, C.M., dkk., 2021. Sex differences in COVID-19: candidate pathways, genetics of ACE2, and sex hormones. *American Journal of Physiology - Heart and Circulatory Physiology*, **320**: H296–H304.
- Wang, J.J., Edin, M.L., Zeldin, D.C., Li, C., Wang, D.W., dan Chen, C., 2020. Good or bad: Application of RAAS inhibitors in COVID-19 patients with cardiovascular comorbidities. *Pharmacology & Therapeutics*, **215**: 107628.
- Wang, T., Tang, R., Ruan, H., Chen, R., Zhang, Z., Sang, L., dkk., 2021a. Predictors of fatal outcomes among hospitalized COVID-19 patients with pre-existing hypertension in China. *The Clinical Respiratory Journal*, **15**: 915–924.
- Wang, T., Tang, R., Ruan, H., Chen, R., Zhang, Z., Sang, L., dkk., 2021b. Predictors of fatal outcomes among hospitalized COVID-19 patients with pre-existing hypertension in China. *The Clinical Respiratory Journal*, **15**: 915–924.

- Wasityastuti, W., Dhamarjati, A., dan Siswanto, S., 2020. Immunosenescence and the Susceptibility of the Elderly to Coronavirus Disease 2019 (COVID-19). *Jurnal Respirologi Indonesia*, **40**: 182–191.
- WHO, 2023. 'Weekly epidemiological update on COVID-19 - 17 August 2023', . URL: <https://www.who.int/publications/m/item/weekly-epidemiological-update-on-covid-19---17-august-2023> (diakses tanggal 27/8/2023).
- WHO 2023, 2023, n.d. 'Tracking SARS-CoV-2 variants', . URL: <https://www.who.int/activities/tracking-SARS-CoV-2-variants> (diakses tanggal 20/2/2023).
- Wrapp, D., Wang, N., Corbett, K.S., Goldsmith, J.A., Hsieh, C.-L., Abiona, O., dkk., 2020. Cryo-EM structure of the 2019-nCoV spike in the prefusion conformation. *Science (New York, N.Y.)*, **367**: 1260–1263.
- Wu, C., Chen, X., Cai, Y., Xia, J., Zhou, Xing, Xu, S., dkk., 2020. Risk Factors Associated With Acute Respiratory Distress Syndrome and Death in Patients With Coronavirus Disease 2019 Pneumonia in Wuhan, China. *JAMA Internal Medicine*, **180**: 934–943.
- Wu, Z. dan McGoogan, J.M., 2020. 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*, **323**: 1239–1242.
- Xu, J., 2020. Use of angiotensin-converting enzyme inhibitors and angiotensin II receptor blockers in context of COVID-19 outbreak: a retrospective analysis. *Frontiers of Medicine*, **14**: 601–612.
- Xu, J., Huang, C., Fan, G., Liu, Z., Shang, L., Zhou, F., dkk., 2020. Use of angiotensin-converting enzyme inhibitors and angiotensin II receptor blockers in context of COVID-19 outbreak: a retrospective analysis. *Frontiers of medicine*, **14**: 601–612.
- Yang, G., Tan, Z., Zhou, L., Yang, M., Peng, L., Liu, J., dkk., 2020. Effects of Angiotensin II Receptor Blockers and ACE (Angiotensin-Converting Enzyme) Inhibitors on Virus Infection, Inflammatory Status, and Clinical Outcomes in Patients With COVID-19 and Hypertension: A Single-Center Retrospective Study. *Hypertension (Dallas, Tex.: 1979)*, **76**: 51–58.
- Ye, Z., Zhang, Y., Wang, Y., Huang, Z., dan Song, B., 2020. Chest CT manifestations of new coronavirus disease 2019 (COVID-19): a pictorial review. *European Radiology*, **30**: 4381–4389.
- Yi, H., 2020. 2019 Novel Coronavirus Is Undergoing Active Recombination. *Clinical Infectious Diseases: An Official Publication of the Infectious Diseases Society of America*, **71**: 884–887.
- Zaenab, A., Jose, V., Cynthia, C.-J., MPH, Yousuf, Z., Claudia, M., dkk., 2021. The Effects of Co-morbidities on COVID-19 Patients Admitted to the Hospital. *Family Medicine & Medical Science Research*, **10**: 1–7.
- Zhang, C., Wu, Z., Li, J.-W., Zhao, H., dan Wang, G.-Q., 2020. Cytokine release syndrome in severe COVID-19: interleukin-6 receptor antagonist tocilizumab may be the key to reduce mortality. *International Journal of Antimicrobial Agents*, **55**: 105954.

- Zhang, G., Wu, Y., Xu, R., dan Du, X., 2021. Effects of renin-angiotensin-aldosterone system inhibitors on disease severity and mortality in patients with COVID-19: A meta-analysis. *Journal of Medical Virology*, **93**: 2287–2300.
- Zhang, J.-J., Cao, Y.-Y., Tan, G., Dong, X., Wang, B.-C., Lin, J., dkk., 2021. Clinical, radiological, and laboratory characteristics and risk factors for severity and mortality of 289 hospitalized COVID-19 patients. *Allergy*, **76**: 533–550.
- Zhang, P., Zhu, L., Cai, J., Lei, F., Qin, J.-J., Xie, J., dkk., 2020a. Association of Inpatient Use of Angiotensin-Converting Enzyme Inhibitors and Angiotensin II Receptor Blockers With Mortality Among Patients With Hypertension Hospitalized With COVID-19. *Circulation Research*, **126**: 1671–1681.
- Zhang, P., Zhu, L., Cai, J., Lei, F., Qin, J.-J., Xie, J., dkk., 2020b. Association of Inpatient Use of Angiotensin-Converting Enzyme Inhibitors and Angiotensin II Receptor Blockers With Mortality Among Patients With Hypertension Hospitalized With COVID-19. *Circulation Research*, **126**: 1671–1681.
- Zhang, Y., Li, H., Zhang, Jian, Cao, Y., Zhao, X., Yu, N., dkk., 2020. The clinical characteristics and outcomes of patients with diabetes and secondary hyperglycaemia with coronavirus disease 2019: A single-centre, retrospective, observational study in Wuhan. *Diabetes, Obesity & Metabolism*, **22**: 1443–1454.
- Zhao, W., Zha, X., Wang, N., Li, D., Li, A., dan Yu, S., 2021. Clinical Characteristics and Durations of Hospitalized Patients With COVID-19 in Beijing: A Retrospective Cohort Study.
- Zhong, Y., Zhao, L., Wu, G., Hu, C., Wu, Chenfang, Xu, M., dkk., 2020. Impact of renin–angiotensin system inhibitors use on mortality in severe COVID-19 patients with hypertension: a retrospective observational study. *Journal of International Medical Research*, **48**: 0300060520979151.
- Zhou, F., Yu, T., Du, R., Fan, G., Liu, Y., Liu, Z., dkk., 2020. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet (London, England)*, **395**: 1054–1062.
- Zhou, P., Yang, X.-L., Wang, X.-G., Hu, B., Zhang, L., Zhang, W., dkk., 2020. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*, **579**: 270–273.