

## DAFTAR PUSTAKA

- Aashaq, S., Batoon, A., Mir, S. A., Beigh, M. A., Andrabi, K. I., & Shah, Z. A. (2022). TGF- $\beta$  signaling: A recap of SMAD-independent and SMAD-dependent pathways. *Journal of cellular physiology*, 237(1), 59–85. <https://doi.org/10.1002/jcp.30529>
- Abdu, H., & Seyoum, G. (2022). Sex Differences in Stroke Risk Factors, Clinical Profiles, and In-Hospital Outcomes Among Stroke Patients Admitted to the Medical Ward of Dessie Comprehensive Specialized Hospital, Northeast Ethiopia. *Degenerative neurological and neuromuscular disease*, 12, 133–144. <https://doi.org/10.2147/DNND.S383564>
- Adnyana, I.M.O. (2020). *Stroke Iskemik*. Bali: Intisari Sains Medis.p.20-25.
- Al-Ajlan, F. S., Alkhiri, A., Alamri, A. F., Alghamdi, B. A., Almaghrabi, A. A., Alharbi, A. R.. (2024). Golden Hour Intravenous Thrombolysis for Acute Ischemic Stroke: A Systematic Review and Meta-Analysis. *Annals of neurology*, 96(3), 582–590. <https://doi.org/10.1002/ana.27007>
- Al Harthi, H. A., Al Kashmiri, A., Zakaryia, L. M., Al-Lawati, J. A., Najem, O. M., Al-Lawati, I., et al. (2022). Clinical Profile of Stroke Patients Presenting to the Emergency Department of a Major Stroke Centre in Oman. *Sultan Qaboos University medical journal*, 22(1), 91–97. <https://doi.org/10.18295/squmj.4.2021.062>
- Al-Kawaz, M., Cho, S. M., Gottesman, R. F., Suarez, J. I., & Rivera-Lara, L. (2022). Impact of Cerebral Autoregulation Monitoring in Cerebrovascular Disease: A Systematic Review. *Neurocritical care*, 36(3), 1053–1070. <https://doi.org/10.1007/s12028-022-01484-5>
- Amini, S., Rezabakhsh, A., Hashemi, J., Saghafi, F., Azizi, H., Sureda, A., et al. (2022). Pharmacotherapy consideration of thrombolytic medications in COVID- 19-associated ARDS. *Journal of intensive care*, 10(1), 38. <https://doi.org/10.1186/s40560-022-00625-4>
- Anrather, J., & Iadecola, C. (2016). Inflammation and Stroke: An Overview. *Neurotherapeutics*, 13(4), 661–670. <https://doi.org/10.1007/s13311-016-0483-x>
- Berge, E., Whiteley, W., Audebert, H., De Marchis, G. M., Fonseca, A. C., Padiglioni, C., et al. (2021). European Stroke Organisation (ESO) guidelines on intravenous thrombolysis for acute ischaemic stroke. *European stroke journal*, 6(1), I–LXII.

<https://doi.org/10.1177/2396987321989865>

- Bonaventura, A., Liberale, L., Vecchié, A., Casula, M., Carbone, F., Dallegrì, F., et al. (2016). Update on Inflammatory Biomarkers and Treatments in Ischemic Stroke. *International journal of molecular sciences*, 17(12), 1967. <https://doi.org/10.3390/ijms17121967>
- Bowry, R., & Grotta, J. C. (2017). Bringing Emergency Neurology to Ambulances: Mobile Stroke Unit. *Seminars in respiratory and critical care medicine*, 38(6), 713–717. <https://doi.org/10.1055/s-0037-1607994>
- Braidy, N., Zarrabi, A., Dastan, S.D., & Memon, A. (2022). Association analysis of rs1800470 (T869C) variation in TGFB1 gene with the risk of ischemic stroke in Asian population. *Central Asian Journal of Medical and Pharmaceutical Sciences*, 2(4), 121-127. <https://doi.org/10.22034/CAJMPSI.2022.04.01>
- Brouns, R., De Deyn. (2009). The complexity of neurobiological processes in acute ischemic stroke. *Clinical Neurology and Neurosurgery*, 111(6):483–95.
- Buonacera, A., Stancanelli, B., Colaci, M., & Malatino, L. (2022). Neutrophil to Lymphocyte Ratio: An Emerging Marker of the Relationships between the Immune System and Diseases. *International journal of molecular sciences*, 23(7), 3636. <https://doi.org/10.3390/ijms23073636>
- Burn, G. L., Foti, A., Marsman, G., Patel, D. F., & Zychlinsky, A. (2021). The Neutrophil. *Immunity*, 54(7), 1377–1391. <https://doi.org/10.1016/j.immuni.2021.06.006>
- Cai, Y., Liu, X., Chen, W., Wang, Z., Xu, G., Zeng, Y., et al. (2015). TGF- $\beta$ 1 prevents blood-brain barrier damage and hemorrhagic transformation after thrombolysis in rats. *Experimental neurology*, 266, 120–126. <https://doi.org/10.1016/j.expneurol.2015.02.013>
- Candelario-Jalil, E., Dijkhuizen, R. M., & Magnus, T. (2022). Neuroinflammation, Stroke, Blood-Brain Barrier Dysfunction, and Imaging Modalities. *Stroke*, 53(5), 1473–1486. <https://doi.org/10.1161/STROKEAHA.122.036946>
- Cao, W., Ling, Y., Yang, L., Wu, F., Zhang, H., Cheng, X., & Dong, Q. (2021). Association of Admission NIHSS Score with Infarct Core Volume and Target Mismatch of Infarct Core/Penumbra Volume on CT Perfusion in Acute Ischaemic Stroke. *Cerebrovascular diseases (Basel, Switzerland)*, 50(6), 700–706. <https://doi.org/10.1159/000515167>

- Caplan, L.R. & Liebeskind, D.S. (2016). *Pathology, anatomy, and pathophysiology of stroke*. Dalam: Caplan's Stroke: A Clinical Approach. Cambridge: Cambridge University Press. Cambridge.p.9–54.
- Caraci, F., Spampinato, S.F., Morgese, M.G., Tascedda, F., Salluzzo, M.G., Giambirtone, M.C., et al. (2018). Neurobiological links between depression and AD: The role of TGF- $\beta$ 1 signaling as a new pharmacological target. *Pharmacological Research*, 130, 374–384.
- Castro, P., Azevedo, E., & Sorond, F. (2018). Cerebral Autoregulation in Stroke. *Current atherosclerosis reports*, 20(8), 37. <https://doi.org/10.1007/s11883-018-0739-5>
- Che, B., Shen, S., Zhu, Z., Wang, A., Xu, T., Peng, Y., et al. (2020). Education Level and Long-term Mortality, Recurrent Stroke, and Cardiovascular Events in Patients With Ischemic Stroke. *Journal of the American Heart Association*, 9(16), e016671. <https://doi.org/10.1161/JAHA.120.016671>
- Che, F., Du, H., Wei, J., Zhang, W., Cheng, Z., & Tong, Y. (2019). MicroRNA-323 suppresses nerve cell toxicity in cerebral infarction via the transforming growth factor- $\beta$ 1/SMAD3 signaling pathway. *International journal of molecular medicine*, 43(2), 993–1002. <https://doi.org/10.3892/ijmm.2018.4020>
- Chen, C. T., Li, L. H., Su, P. Y., Chang, Y. C., Lee, I. H., Yen, D. H., & How, C. K. (2022). Neutrophil-to-lymphocyte ratio in predicting neurologic outcome of patients with acute ischemic stroke treated with intravenous thrombolytics. *Journal of the Chinese Medical Association*, 85(1), 102–108. <https://doi.org/10.1097/JCMA.0000000000000599>
- Chen, L., Zhang, L., Li, Y., Zhang, Q., Fang, Q., & Tang, X. (2024). Association of the Neutrophil-to-Lymphocyte Ratio with 90-Day Functional Outcomes in Patients with Acute Ischemic Stroke. *Brain sciences*, 14(3), 250. <https://doi.org/10.3390/brainsci14030250>
- Chen, Q., Li, X., Yang, Y., Ni, J., & Chen, J. (2025). Combined Analysis of Human and Experimental Rat Samples Identified Biomarkers for Ischemic Stroke. *Molecular neurobiology*, 62(3), 3794–3812. <https://doi.org/10.1007/s12035-024-04512-x>
- Chen, T., Pan, H., Li, J., Xu, H., Jin, H., Qian, C., et al. (2018). Inhibiting of RIPK3 attenuates early brain injury following subarachnoid hemorrhage: Possibly through

- alleviating necroptosis. *Biomedicine & pharmacotherapy*, 107, 563–570. <https://doi.org/10.1016/j.biopha.2018.08.056>
- Chester, K. W., Corrigan, M., Schoeffler, J. M., Shah, M., Toy, F., Purdon, B., et al. (2019). Making a case for the right '-ase' in acute ischemic stroke: alteplase, tenecteplase, and reteplase. *Expert opinion on drug safety*, 18(2), 87–96. <https://doi.org/10.1080/14740338.2019.1573985>
- Chia, Z. J., Cao, Y. N., Little, P. J., & Kamato, D. (2024). Transforming growth factor- $\beta$  receptors: versatile mechanisms of ligand activation. *Acta pharmacologica Sinica*, 45(7), 1337–1348. <https://doi.org/10.1038/s41401-024-01235-6>
- Choudhari, O. K., Rani, A., Kampani, G., Kaur, C., Sengupta, A. (2021). Matrix Metalloproteinase-9 Gene Polymorphism and Its Methylation in Stroke Patients. *The Malaysian journal of medical sciences*, 28(6), 32–41. <https://doi.org/10.21315/mjms2021.28.6.4>
- Dang, H., Mao, W., Wang, S., Sha, J., Lu, M., Cong, L., et al. (2023). Systemic inflammation response index as a prognostic predictor in patients with acute ischemic stroke: A propensity score matching analysis. *Frontiers in neurology*, 13, 1049241. <https://doi.org/10.3389/fneur.2022.1049241>
- Depreitere, B., Citerio, G., Smith, M., Adelson, P. D., Aries, M. J., Bleck, T. P., et al. (2021). Cerebrovascular Autoregulation Monitoring in the Management of Adult Severe Traumatic Brain Injury: A Delphi Consensus of Clinicians. *Neurocritical care*, 34(3), 731–738. <https://doi.org/10.1007/s12028-020-01185-x>
- Dillon, G. M., Stevens, S., Dusenbury, W. L., Massaro, L., Toy, F., Purdon, B. (2019). Choosing the Correct "-ase" in Acute Ischemic Stroke: Alteplase, Tenecteplase, and Reteplase. *Advanced emergency nursing journal*, 41(3), 271–278. <https://doi.org/10.1097/TME.0000000000000254>
- Dobolyi, A., Vincze, C., Pál, G., Lovas, G. (2012). The neuroprotective functions of transforming growth factor beta proteins. *International journal of molecular sciences*, 13(7), 8219–8258. <https://doi.org/10.3390/ijms13078219>
- Dong, Q., Dong, Y., Liu, L., Xu, A., Zhang, Y., Zheng, H., et al. (2017). The Chinese Stroke Association scientific statement: intravenous thrombolysis in acute ischaemic stroke. *Stroke and vascular neurology*, 2(3), 147–159. <https://doi.org/10.1136/svn-2017-000074>
- Donkor E. S. (2018). Stroke in the 21st Century: A Snapshot of the Burden,

- Epidemiology, and Quality of Life. *Stroke research and treatment*, 2018, 3238165.  
<https://doi.org/10.1155/2018/3238165>
- Duffin, J., Sobczyk, O., McKetton, L., Crawley, A., Poublanc, J., Venkatraghavan, L., et al. (2018). Cerebrovascular Resistance: The Basis of Cerebrovascular Reactivity. *Frontiers in neuroscience*, 12, 409.  
<https://doi.org/10.3389/fnins.2018.00409>
- Edwards, D. N., & Bix, G. J. (2019). The Inflammatory response After Ischemic Stroke: Targeting  $\beta_2$  and  $\beta_1$  Integrins. *Frontiers in neuroscience*, 13, 540.  
<https://doi.org/10.3389/fnins.2019.00540>
- Elsheikh, W. M., Alahmar, I. E., Salem, G. M., & Matar, E. S. (2020). New stroke prognostic factors. *The Egyptian Journal of Neurology, Psychiatry and Neurosurgery*, 56, 1-9. <https://doi.org/10.1186/s41983-020-00193-0>
- Emde, J., Baumgart, R., Langguth, N., Juenemann, M., & Gerner, S. T. (2022). Intravenous thrombolysis in ischemic stroke patients based on non-contrast CT in the extended time-window. *Frontiers in Stroke*, 1, 1026138.  
<https://doi.org/10.3389/fstro.2022.1026138>
- Feigin, V. L., Brainin, M., Norrving, B., Martins, S., Sacco, R. L., Hacke, W., Fisher, M., Pandian, J., & Lindsay, P. (2022). World Stroke Organization (WSO): Global Stroke Fact Sheet 2022. *International journal of stroke*, 17(1), 18–29.  
<https://doi.org/10.1177/17474930211065917>
- Feigin, V.L., Grupper, M.F. & Rautalin, I. (2025). World Stroke Organization: Global Stroke Fact Sheet 2025. *International Journal of Stroke*, 20(2), pp.132–144.<https://doi.org/10.1177/17474930241308142>
- Ferro, D., Matias, M., Neto, J., Dias, R., Moreira, G., Petersen, N., et al. (2021). Neutrophil-to-Lymphocyte Ratio Predicts Cerebral Edema and Clinical Worsening Early After Reperfusion Therapy in Stroke. *Stroke*, 52(3), 859–867.  
<https://doi.org/10.1161/STROKEAHA.120.032130>
- Fessel, J. (2019). Ineffective levels of transforming growth factors and their receptor account for old age being a risk factor for Alzheimer's disease. *Alzheimer's & dementia*, 5, 899–905. <https://doi.org/10.1016/j.jtrci.2019.11.007>
- Forget, P., Khalifa, C., Defour, J. P., Latinne, D., Van Pel, M. C., & De Kock, M. (2017). What is the normal value of the neutrophil-to-lymphocyte ratio?. *BMC research notes*, 10(1), 12. <https://doi.org/10.1186/s13104-016-2335-5>

- Gao, H. M., Chen, H., Cui, G. Y., Hu, J. X. (2023). Damage mechanism and therapy progress of the blood-brain barrier after ischemic stroke. *Cell & bioscience*, 13(1), 196. <https://doi.org/10.1186/s13578-023-01126-z>
- Gao, P., Wu, W., Ye, J., Lu, Y. W., Adam, A. P., Singer, H. A., et al. (2018). Transforming growth factor  $\beta$ 1 suppresses proinflammatory gene program independent of its regulation on vascular smooth muscle differentiation and autophagy. *Cellular signalling*, 50, 160–170. <https://doi.org/10.1016/j.cellsig.2018.07.002>
- George, J., Aref, H., Nasser, A. A., Nasef, A., Elbassiouny, A., & Roushdy, T. (2023). Gender disparity versus equality in acute stroke: a Middle Eastern country hospital-based study. *The Egyptian journal of neurology, psychiatry and neurosurgery*, 59(1), 73. <https://doi.org/10.1186/s41983-023-00672-0>
- Ghozy, S., Reda, A., Varney, J., Elhawary, A. S., Shah, J., Murry, K., et al. (2022). Neuroprotection in Acute Ischemic Stroke: A Battle Against the Biology of Nature. *Frontiers in neurology*, 13, 870141. <https://doi.org/10.3389/fneur.2022.870141>
- Giles, J. R., Globig, A. M., Kaech, S. M., & Wherry, E. J. (2023). CD8+ T cells in the cancer-immunity cycle. *Immunity*, 56(10), 2231–2253. <https://doi.org/10.1016/j.jimmuni.2023.09.005>
- Global Burden Disease (GBD) 2019 Stroke Collaborators. (2021). Global, regional, and national burden of stroke and its risk factors, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet Neurol*, 20:795- 820.
- Gong, P., Xie, Y., Jiang, T., Liu, Y., Wang, M., Sun, H., et al. (2019). Neutrophil-lymphocyte ratio predicts post-thrombolysis early neurological deterioration in acute ischemic stroke patients. *Brain and behavior*, 9(10), e01426. <https://doi.org/10.1002/brb3.1426>
- Goyal, N., Tsivgoulis, G., Chang, J. J., Malhotra, K., Pandhi, A., Ishfaq, M. F., et al. (2018). Admission Neutrophil-to-Lymphocyte Ratio as a Prognostic Biomarker of Outcomes in Large Vessel Occlusion Strokes. *Stroke*, 49(8), 1985–1987. <https://doi.org/10.1161/STROKEAHA.118.021477>
- Graça, S. C., Mosca, T., Gagliardi, V. D. B., Forte, W. C. N., & Gagliardi, R. J. (2024). Prognostic Impact of Neutrophil-to-Lymphocyte Ratio in Ischemic Stroke. *Journal of personalized medicine*, 14(12), 1149. <https://doi.org/10.3390/jpm14121149>

- Gungor, M. Z., Uysal, M., & Senturk, S. (2022). The Bright and the Dark Side of TGF- $\beta$  Signaling in Hepatocellular Carcinoma: Mechanisms, Dysregulation, and Therapeutic Implications. *Cancers*, 14(4), 940.
- Handoko, E.A., Muslim, Z., Kuniawan, L.R. (2025). Profil Pasien Stroke Di RS Bhayangkara Bondowoso Tahun 2024. *Syntax Idea*, 7(3), 475-486.
- Harris, S., Sungkar, S., Rasyid, A., Kurniawan, M., Mesiano, T., & Hidayat, R. (2018). TOAST Subtypes of Ischemic Stroke and Its Risk Factors: A Hospital-Based Study at Cipto Mangunkusumo Hospital, Indonesia. *Stroke research and treatment*, 2018, 9589831. <https://doi.org/10.1155/2018/9589831>
- Hasan, T. F., Rabinstein, A. A., Middlebrooks, E. H., Haranhalli, N., Silliman, S. L., Meschia, J. F., et al. (2018). Diagnosis and Management of Acute Ischemic Stroke. *Mayo Clinic proceedings*, 93(4), 523–538. <https://doi.org/10.1016/j.mayocp.2018.02.013>
- Hayson, A., Burton, J., Allen, J., Sternbergh, W. C., 3rd, Fort, D., Bazan, H. A. (2023). Impact of presenting stroke severity and thrombolysis on outcomes following urgent carotid interventions. *Journal of vascular surgery*, 78(3), 702–710. <https://doi.org/10.1016/j.jvs.2023.04.031>
- He, L., Wang, J., Wang, F., Zhang, L., Zhang, L., & Zhao, W. (2020). Increased neutrophil-to-lymphocyte ratio predicts the development of post-stroke infections in patients with acute ischemic stroke. *BMC neurology*, 20(1), 328. <https://doi.org/10.1186/s12883-020-01914-x>
- Hewitt, B., Ali, M., Hubbard, J., Hill, L., Botfield, H. (2024). The double-edged sword of transforming growth factor  $\beta$  1: a systematic review of pre-clinical stroke models. *Research square*, 29, 1-41. <https://doi.org/10.21203/rs.3.rs-4687466/v1>
- Hossmann, K.A., Heiss, W.D. (2019). Neuropathology and Pathophysiology of Stroke. Dalam: Brainin, M., Heiss, W.D., editors. *Textbook of Stroke Medicine 3<sup>rd</sup> Edition*. Cambridge: Cambridge University Press.p.1-37.
- Hou, D., Wang, C., Fe, X.Y., Zhong, P., Wu, D. (2021). Increased Neutrophil-To-Lymphocyte Ratio After Thrombolysis Improves Prediction of 3-Month Stroke Outcome. *Research Square*, 1, 1-16. <http://dx.doi.org/10.21203/rs.3.rs-156684/v1>
- Howe, M. D., Furr, J. W., Munshi, Y., Roy-O'Reilly, M. A., Maniskas, M. E., Koellhoffer, E. C., et al. (2019). Transforming growth factor- $\beta$  promotes basement membrane fibrosis, alters perivascular cerebrospinal fluid distribution, and

- worsens neurological recovery in the aged brain after stroke. *GeroScience*, 41(5), 543–559. <https://doi.org/10.1007/s11357-019-00118-7>
- Huang, J. G., Ren, J. X., Chen, Y., Tian, M. F., Zhou, L., Wen, J., et al. (2023). M2 macrophages mediate fibrotic scar formation in the early stages after cerebral ischemia in rats. *Neural regeneration research*, 18(10), 2208–2218. <https://doi.org/10.4103/1673-5374.368299>
- Huhtakangas, J. K., Saaresranta, T., Huhtakangas, M., Haapea, M., & Huhtakangas, J. (2024). Thrombolysis treatment protected impairment of functional ability, quality of life and fatigue seven years after stroke. *Journal of stroke and cerebrovascular diseases*, 33(6), 107707. <https://doi.org/10.1016/j.jstrokecerebrovasdis.2024.107707>
- Iacobucci, M., Risitano, A., Amisano, P., Berto, I., Carnevale, R., Cammisotto, V., et al. (2025). Role of Endothelin-1 and Nitric Oxide in Acute Ischemic Stroke Leptomeningeal Collateral Activation. *International journal of molecular sciences*, 26(7), 3205.
- Imran, Y., & Zahra, A. A. (2024). The Use of NIHSS as an Assessment of Acute Stroke Severity. *Journal of Society Medicine*, 3(2), 31–34. <https://doi.org/10.47353/jsocmed.v3i2.128>
- Jayaraj, R. L., Azimullah, S., Beiram, R., Jalal, F. Y., & Rosenberg, G. A. (2019). Neuroinflammation: friend and foe for ischemic stroke. *Journal of neuroinflammation*, 16(1), 142. <https://doi.org/10.1186/s12974-019-1516-2>
- Jeong, S. M., Lee, H. R., Han, K., Jeon, K. H., Kim, D., Yoo, J. E., et al. (2022). Association of Change in Alcohol Consumption With Risk of Ischemic Stroke. *Stroke*, 53(8), 2488–2496. <https://doi.org/10.1161/STROKEAHA.121.037590>
- Jickling, G. C., & Sharp, F. R. (2015). Biomarker panels in ischemic stroke. *Stroke*, 46(3), 915–920. <https://doi.org/10.1161/STROKEAHA.114.005604>
- Jin, M., Peng, Q., & Wang, Y. (2023). Post-thrombolysis early neurological deterioration occurs with or without hemorrhagic transformation in acute cerebral infarction: Risk factors, prediction model and prognosis. *Helijon*, 9(5), e15620. <https://doi.org/10.1016/j.heliyon.2023.e15620>
- Kasner S. E. (2006). Clinical interpretation and use of stroke scales. *The Lancet. Neurology*, 5(7), 603–612. [https://doi.org/10.1016/S1474-4422\(06\)70495-1](https://doi.org/10.1016/S1474-4422(06)70495-1)
- Kementerian Kesehatan Republik Indonesia (KEMENKES RI). (2019). *Laporan*

*Provinsi Sumatera Barat RISKESDAS 2018.* Lembaga Penerbit Badan Penelitian dan Pengembangan Kesehatan; Jakarta.

- Khan, M. S. A., Ahmad, S., Ghafoor, B., Shah, M. H., Mumtaz, H., Ahmad, W., Banu, R., Ahmad, I., Iqbal, J., Safi, M. I., & Khan, F. (2022). Inpatient assessment of the neurological outcome of acute stroke patients based on the National Institute of Health Stroke Scale (NIHSS). *Annals of medicine and surgery* (2012), 82, 104770. <https://doi.org/10.1016/j.amsu.2022.104770>
- Kim, B. J., Han, M. K., Park, T. H., Park, S. S., Lee, K. B., Lee, B. C., et al. (2015). Low-Versus Standard-Dose Alteplase for Ischemic Strokes Within 4.5 Hours: A Comparative Effectiveness and Safety Study. *Stroke*, 46(9), 2541–2548. <https://doi.org/10.1161/STROKEAHA.115.010180>
- Kim, M. S., Heo, M. Y., Joo, H. J., Shim, G. Y., Chon, J., Chung, S. J., et al. (2023). Neutrophil-to-Lymphocyte Ratio as a Predictor of Short-Term Functional Outcomes in Acute Ischemic Stroke Patients. *International journal of environmental research and public health*, 20(2), 898. <https://doi.org/10.3390/ijerph20020898>
- Kim, S. K., Barron, L., Hinck, C. S., Petrunak, E. M., Cano, K. E., Thangirala, A., et al. (2017). An engineered transforming growth factor  $\beta$  (TGF- $\beta$ ) monomer that functions as a dominant negative to block TGF- $\beta$  signaling. *The Journal of biological chemistry*, 292 (17), 7173–7188. <https://doi.org/10.1074/jbc.M116.768754>
- Kobeissi, H., Ghozy, S., Bilgin, C., Kadirvel, R., & Kallmes, D. F. (2023). Early neurological improvement as a predictor of outcomes after endovascular thrombectomy for stroke: a systematic review and meta-analysis. *Journal of neurointerventional surgery*, 15(6), 547–551. <https://doi.org/10.1136/neurintsurg-2022-019008>
- Kotfis, K., Bott-Olejnik, M., Szylińska, A., & Rotter, I. (2019). Could Neutrophil-to-Lymphocyte Ratio (NLR) Serve as a Potential Marker for Delirium Prediction in Patients with Acute Ischemic Stroke? A Prospective Observational Study. *Journal of clinical medicine*, 8(7), 1075. <https://doi.org/10.3390/jcm8071075>
- Kuriakose, D., & Xiao, Z. (2020). Pathophysiology and Treatment of Stroke: Present Status and Future Perspectives. *International journal of molecular sciences*, 21(20), 7609. <https://doi.org/10.3390/ijms21207609>

- Lattanzi, S., Cagnetti, C., Provinciali, L., & Silvestrini, M. (2016). Neutrophil-to-Lymphocyte Ratio Predicts the Outcome of Acute Intracerebral Hemorrhage. *Stroke*, 47(6), 1654–1657. <https://doi.org/10.1161/STROKEAHA.116.013627>
- Leng, K., Li, E., Eser, R., Piergies, A., Sit, R., Tan, M., et al. (2021). Molecular characterization of selectively vulnerable neurons in Alzheimer's disease. *Nature neuroscience*, 24(2), 276–287. <https://doi.org/10.1038/s41593-020-00764-7>
- Li, S., Hu, L., Wang, J., Zou, F., Han, B., Wang, Y., et al. (2022). Prolonged increased neutrophil-to-lymphocyte ratio is associated with mortality after successful revascularization for treatment of acute ischemic stroke. *BMC neurology*, 22(1), 326. <https://doi.org/10.1186/s12883-022-02847-3>
- Li, Y., Wang, W., Yang, F., Xu, Y., Feng, C., & Zhao, Y. (2019). The regulatory roles of neutrophils in adaptive immunity. *Cell Communication and Signaling*, 17, 1–11. <https://doi.org/10.1186/s12964-019-0471-y>
- Li, Z. R., Wang, Y. Y., Wang, Z. H., Qin, Q. L., Huang, C., Shi, G. S., et al. (2024a). The positive role of TRANSFORMING GROWTH FACTOR-Beta 1 in ischemic stroke. *Cellular signalling*, 121, 111301. <https://doi.org/10.1016/j.cellsig.2024.111301>
- Li, X. Y., Kong, X. M., Yang, C. H., Cheng, Z. F., Lv, J. J., Guo, H., & Liu, X. H. (2024b). Global, regional, and national burden of ischemic stroke, 1990–2021: an analysis of data from the global burden of disease study 2021. *EClinicalMedicine*, 75, 102758. <https://doi.org/10.1016/j.eclinm.2024.102758>
- Liang, Z. H., Gu, J. J., Yu, W. X., Guan, Y. Q., Khater, M., & Li, X. B. (2020). Bone marrow mesenchymal stem cell transplantation downregulates plasma level and the microglia expression of transforming growth factor  $\beta$ 1 in the acute phase of cerebral cortex ischemia. *Chronic diseases and translational medicine*, 6(4), 270–280. <https://doi.org/10.1016/j.cdtm.2020.05.005>
- Lindsay, M. P., Norrving, B., Sacco, R. L., Brainin, M., Hacke, W., Martins, S., et al. (2019). World Stroke Organization (WSO): Global Stroke Fact Sheet 2019. *International journal of stroke*, 14(8), 806–817. <https://doi.org/10.1177/1747493019881353>
- Luo J. (2022). TGF- $\beta$  as a Key Modulator of Astrocyte Reactivity: Disease Relevance and Therapeutic Implications. *Biomedicines*, 10(5), 1206.
- Lux, D., Alakbarzade, V., Bridge, L., Clark, C. N., Clarke, B., Zhang, L., Khan, U., &

- Pereira, A. C. (2020). The association of neutrophil-lymphocyte ratio and lymphocyte-monocyte ratio with 3-month clinical outcome after mechanical thrombectomy following stroke. *Journal of neuroinflammation*, 17(1), 60. <https://doi.org/10.1186/s12974-020-01739-y>
- Ma, M., Ma, Y., Yi, X., Guo, R., Zhu, W., Fan, X., et al. (2008). Intranasal delivery of transforming growth factor-beta1 in mice after stroke reduces infarct volume and increases neurogenesis in the subventricular zone. *BMC neuroscience*, 9, 117. <https://doi.org/10.1186/1471-2202-9-117>
- Maghfirah, C. Z., Ikhsan, M., & Fonna, T. R. (2025). The Severity Of Ishemic Stroke Based On The National Institute Of Health Stroke Scale (NIHSS) Score In The Inpatient Room Of The Nervic Department Of Cut Meutia Hospital, North Aceh. *Jurnal Ilmiah Manusia Dan Kesehatan*, 8(2), 483–495.
- Maida, C. D., Norrito, R. L., Daidone, M., Tuttolomondo, A., & Pinto, A. (2020). Neuroinflammatory Mechanisms in Ischemic Stroke: Focus on Cardioembolic Stroke, Background, and Therapeutic Approaches. *International journal of molecular sciences*, 21(18), 6454. <https://doi.org/10.3390/ijms21186454>
- Mair, G., von Kummer, R., Morris, Z., von Heijne, A., Bradey, N., Cala, L., et al. (2018). Effect of IV alteplase on the ischemic brain lesion at 24-48 hours after ischemic stroke. *Neurology*, 91(22), e2067–e2077. <https://doi.org/10.1212/WNL.0000000000006575>
- Majumder D. (2024). Ischemic Stroke: Pathophysiology and Evolving Treatment Approaches. *Neuroscience insights*, 19, 26331055241292600.
- Man, S., Solomon, N., Mac Grory, B., Alhanti, B., Saver, J. L., Smith, E. E., et al. (2024). Trends in Stroke Thrombolysis Care Metrics and Outcomes by Race and Ethnicity, 2003-2021. *JAMA network open*, 7(2), e2352927. <https://doi.org/10.1001/jamanetworkopen.2023.52927>
- Maratning, A., Azmiyah, L., Oktovin, Warjiman. (2021). Pengetahuan Keluarga tentang Faktor Risiko dan Gejala Awal Stroke di RSUD H. Boejasin Pelaihari, *Jurnal Keperawatan Suaka Insan (JKSI)*, 6(1), 76-82.
- Marko, M., Posekany, A., Szabo, S., Scharer, S., Kiechl, S., Knoflach, M., et al. (2020). Trends of r-tPA (Recombinant Tissue-Type Plasminogen Activator) marrow mesenchymal stem cell transplantation downregulates plasma level and the microglia expression of transforming growth factor  $\beta$ 1 in the acute phase of

- cerebral cortex ischemia. *Chronic diseases and translational medicine*, 6(4), 270–280. <https://doi.org/10.1016/j.cdtm.2020.05.005>
- Martin, S. S., Aday, A. W., Allen, N. B., Almarzooq, Z. I., Anderson, C. A. M., Arora, P., et al. (2025). 2025 Heart Disease and Stroke Statistics: A Report of US and Global Data From the American Heart Association. *Circulation*, 151(8), e41–e660. <https://doi.org/10.1161/CIR.0000000000001303>
- Mathias, K., Machado, R. S., Stork, S., Dos Santos, D., Joaquim, L., Generoso, J., et al. (2024). Blood-brain barrier permeability in the ischemic stroke: An update. *Microvascular research*, 151, 104621. <https://doi.org/10.1016/j.mvr.2023.104621>
- Mawardi A.I. (2022). *Analysis of Correlation Between Transforming Growth Factor Beta-1 Serum Levels on The Clinical Degree of Ischemic Stroke Patients*. Tesis. Universitas Hasanuddin.
- Mayor, D., Tymianski, M. (2018). Neurotransmitters in the mediation of cerebral ischemic injury. *Neuropharmacology*, 134:178–88. <https://doi.org/10.1016/j.neuropharm.2017.11.050>
- Memiş, Z., Gürkaş, E., Özdemir, A. Ö., Acar, B. A., Öğün, M. N., Aytaç, E., et al. (2024). Impact of Neutrophil-to-Lymphocyte Ratio on Stroke Severity and Clinical Outcome in Anterior Circulation Large Vessel Occlusion Stroke. *Diagnostics (Basel, Switzerland)*, 14(24), 2880. <https://doi.org/10.3390/diagnostics14242880>
- Mirawati, D., Mutnawasitoh, A.R. (2024). Hubungan Tingkat Pendidikan dengan Pengetahuan Stroke pada Lansia. *Care: Jurnal Ilmiah Ilmu Kesehatan*, 12(1), 114-124.<https://doi.org/10.33366/jc.v12i1.5024>
- Mishra, A., Tandon, R., Paliwal, V., & Jha, S. (2024). How well does peripheral blood neutrophil-to-lymphocyte ratio predict the severity and prognosis of hemorrhagic Stroke. *Clinical neurology and neurosurgery*, 239, 108211. <https://doi.org/10.1016/j.clineuro.2024.108211>
- Miyazono, K., Katsuno, Y., Koinuma, D., Ehata, S., & Morikawa, M. (2018). Intracellular and extracellular TGF- $\beta$  signaling in cancer: some recent topics. *Frontiers of medicine*, 12(4), 387–411. <https://doi.org/10.1007/s11684-018-0646-6>
- Mohamed, W. S., Abdel Ghaffar, A. S., Abdel Gawad, A. E., & Agban, E. L. (2021). Short-term outcome in ischemic stroke patients after thrombolytic therapy. *The Egyptian Journal of Neurology, Psychiatry and Neurosurgery*, 57, 1-8.
- Mohieyeldeen, A. (2021). Prognostic value of neutrophil lymphocyte ratio in acute

- ischemic stroke patients either received reperfusion therapy or not. *Journal of the Neurological Sciences*, 429, 29.
- Mondal, M. B. A., Hasan, A. T. M. H., Khan, N., & Mohammad, Q. D. (2022). Prevalence and risk factors of stroke in Bangladesh: A nationwide population-based survey. *eNeurologicalSci*, 28, 100414.
- Mortaz, E., Alipoor, S. D., Adcock, I. M., Mumby, S., & Koenderman, L. (2018). Update on Neutrophil Function in Severe Inflammation. *Frontiers in immunology*, 9, 2171. <https://doi.org/10.3389/fimmu.2018.02171>
- Moses, H. L., Roberts, A. B., & Derynck, R. (2016). The Discovery and Early Days of TGF- $\beta$ : A Historical Perspective. *Cold Spring Harbor perspectives in biology*, 8(7), a021865. <https://doi.org/10.1101/cshperspect.a021865>
- Mujanovic, A., Ng, F., Meinel, T. R., Dobrocky, T., Piechowiak, E. I., Kurmann, C. C., et al (2024). No-reflow phenomenon in stroke patients: A systematic literature review and meta-analysis of clinical data. *International journal of stroke*, 19(1), 58–67. <https://doi.org/10.1177/17474930231180434>
- Nada, M. M., Kasem, S. M., Fahim, M. K., Tork, M. A., & Moselhy, K. S. (2022). Comparative Retrospective study of NIHSS score before and after thrombolytic therapy in stroke patients. *Benha Journal of Applied Sciences*, 7(11), 67-73.
- Nadhifah, T.A. & Sjarqiah, U. (2022). Gambaran pasien stroke pada lansia di Rumah Sakit Islam Jakarta Sukapura tahun 2019. *Muhammadiyah Journal of Geriatric*,, 3(1), 23-30. <https://doi.org/10.24853/mujg.3.1.23-30>
- Neubauer, K., & Zieger, B. (2022). Endothelial cells and coagulation. *Cell and tissue research*, 387(3), 391–398. <https://doi.org/10.1007/s00441-021-03471-2>
- Nian, K., Harding, I. C., Herman, I. M., & Ebong, E. E. (2020). Blood-Brain Barrier Damage in Ischemic Stroke and Its Regulation by Endothelial Mechanotransduction. *Frontiers in physiology*, 11, 605398. <https://doi.org/10.3389/fphys.2020.605398>
- Olalusi, O.V., Yaria, J., Makanjuola, A., Akinyemi, R., Owolabi, M., Ogunniyi, A. (2025). Comparison of admitting neutrophil/lymphocyte ratio with baseline NIH stroke scale score in discriminating poor 30-day stroke outcome among Nigerian Africans. *Frontiers in Stroke*, 4, 1562048. <https://doi.org/10.3389/fstro.2025.1562048>.
- Orakpoghenor O. (2019). Lymphocyte: A Brief Review. *Scientific Journal of Fakultas Kedokteran Universitas Andalas* 77

*Immunology & Immunotherapy*, 3(1), :4-8.

- Papenfuss, T., Bolon, B. Lymphocytes (2016). Dalam: Vohr, H.W., editor. *Encyclopedia of Immunotoxicology*. Berlin: Springer.p.32-45.
- Paudel, S. S., Thapa, B., & Luitel, R. (2021). Neutrophil Lymphocyte Ratio as a Prognostic Marker in Acute Ischemic Stroke: a Systematic Review and Meta-analysis. *Journal of Nepal Health Research Council*, 18(4), 573–579. <https://doi.org/10.33314/jnhrc.v18i4.3143>
- Pektezel, M. Y., Yilmaz, E., Arsava, E. M., & Topcuoglu, M. A. (2019). Neutrophil-to-Lymphocyte Ratio and response to Intravenous Thrombolysis in Patients with Acute Ischemic Stroke. *Journal of stroke and cerebrovascular diseases*, 28(7), 1853–1859. <https://doi.org/10.1016/j.jstrokecerebrovasdis.2019.04.014>
- Peng, X. Q., Cheng, F., & Zhou, L. (2023). Association Between TRANSFORMING GROWTH FACTOR-Beta 1 Polymorphisms and Ischemic Stroke Susceptibility: A Meta-Analysis. *Clinical and applied thrombosis/hemostasis*, 29, 10760296231166666. <https://doi.org/10.1177/10760296231166666>
- Pinzon, R. T., & Veronica, V. (2022). Leukocyte Count and Neutrophil-To-Lymphocyte Ratio as Simple Hematologic Predictors of Stroke Severity and Functional Outcome in Acute Ischemic Stroke Patients. *Open Neurology Journal*, 16, 1-7. <http://dx.doi.org/10.2174/1874205X-v16-e2209280>
- Powers, W. J., Rabinstein, A. A., Ackerson, T., Adeoye, O. M., Bambakidis, N. C., Becker, K., et al. (2018). 2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke*, 49(3), e46–e110. <https://doi.org/10.1161/STR.0000000000000158>
- Pupo, G. L., Van San, E., Delgado-Hernández, R., Vanden Berghe, T., & Vanden Berghe, W. (2020). Emerging immune and cell death mechanisms in stroke: Saponins as therapeutic candidates. *Brain, behavior, & immunity - health*, 9, 100152. <https://doi.org/10.1016/j.bbih.2020.100152>
- Puspitasari, V., Wahid, S., Aliah, A. & Suhadi, B. (2017). Correlation between Levels of Transforming Growth Factor Beta 1 (TGF- $\beta$ 1) serum with Clinical Outcome on Acute Anterior Circulation Ischemic Strokes. *International Journal of Clinical and Experimental Neurology*, 5 (1), 1-4. <http://dx.doi.org/10.12691/ijcen-5-1-1>
- Quan, K., Wang, A., Zhang, X., Meng, X., Chen, P., Li, H., & Wang, Y. (2021).

- Neutrophil to lymphocyte ratio and adverse clinical outcomes in patients with ischemic stroke. *Annals of translational medicine*, 9(13), 1047. <https://doi.org/10.21037/atm-21-710>
- Ramiro, L., Simats, A., García-Berrocoso, T., & Montaner, J. (2018). Inflammatory molecules might become both biomarkers and therapeutic targets for stroke management. *Therapeutic advances in neurological disorders*, 11, 1756286418789340. <https://doi.org/10.1177/1756286418789340>
- Retnaningsih, Hendartono, T.K. (2019). Profile Of Acute Ischemic Stroke Patients with Recombinant Tissue Plasminogen Activator Therapy in Dr. Kariadi Hospital Semarang. *Neurona*, 36(4), 280-288. <https://doi.org/10.52386/neurona.v36i4.86>
- Rosales C. (2018). Neutrophil: A Cell with Many Roles in Inflammation or Several Cell Types?. *Frontiers in physiology*, 9, 113. <https://doi.org/10.3389/fphys.2018.00113>
- Saini, V., Guada, L., & Yavagal, D. R. (2021). Global Epidemiology of Stroke and Access to Acute Ischemic Stroke Interventions. *Neurology*, 97(20 Suppl 2), S6–S16. <https://doi.org/10.1212/WNL.00000000000012781>
- Sandmark, D. K., Bashir, A., Wellington, C. L., & Diaz-Arrastia, R. (2019). Cerebral Microvascular Injury: A Potentially Treatable Endophenotype of Traumatic Brain Injury-Induced Neurodegeneration. *Neuron*, 103(3), 367–379. <https://doi.org/10.1016/j.neuron.2019.06.002>
- Sarengat, R. F., Islam, M. S., & Ardhi, M. S. (2021). Correlation of neutrophil-to-lymphocyte ratio and clinical outcome of acute thrombotic stroke in patients with COVID-19. *Narra J*, 1(3), e50. <https://doi.org/10.52225/narra.v1i3.50>
- Sekerdag, E., Solaroglu, I., & Gursoy-Ozdemir, Y. (2018). Cell Death Mechanisms in Stroke and Novel Molecular and Cellular Treatment Options. *Current neuropharmacology*, 16(9), 1396–1415. <https://doi.org/10.2174/1570159X16666180302115544>
- Shah, R.S. & Jeyaretna, D.S. (2018). Cerebral vascular anatomy and physiology. *Surgery*, 36(11), 606-12. <https://doi.org/10.1016/j.mpsur.2024.05.009>
- Shan, Y., Zhang, R., Lu, J., Huang, L., Wang, Y., Long, F., et al. (2024). Neutrophil to lymphocyte ratio and five-year mortality in patients with acute ischemic stroke. *Heliyon*, 10(17), e36827. <https://doi.org/10.1016/j.heliyon.2024.e36827>
- Sherin, A., Ul-Haq, Z., Fazid, S., Shah, B. H., Khattak, M. I., & Nabi, F. (2020).

- Prevalence of stroke in Pakistan: Findings from Khyber Pakhtunkhwa integrated population health survey (KP-IPHS) 2016-17. *Pakistan journal of medical sciences*, 36(7), 1435–1440. <https://doi.org/10.12669/pjms.36.7.2824>
- Shi, J., Peng, H., You, S., Liu, Y., Xu, J., Xu, Y., et al. (2018). Increase in neutrophils after recombinant tissue plasminogen activator thrombolysis predicts poor functional outcome of ischaemic stroke: a longitudinal study. *European journal of neurology*, 25(4), 687–e45. <https://doi.org/10.1111/ene.13575>
- Simmons, C. A., Poupore, N., & Nathaniel, T. I. (2023). Age Stratification and Stroke Severity in the Telestroke Network. *Journal of Clinical Medicine*, 12(4). <https://doi.org/10.3390/jcm12041519>
- Slevin, M., Krupinski, J., Slowik, A., Kumar, P., Szczudlik, A., & Gaffney, J. (2000). Serial measurement of vascular endothelial growth factor and transforming growth factor-beta1 in serum of patients with acute ischemic stroke. *Stroke*, 31(8), 1863–1870. <https://doi.org/10.1161/01.str.31.8.1863>
- Song, Q., Li, Y., Wang, Y., Wei, C., Liu, J., & Liu, M. (2018). Increased Neutrophil-to-lymphocyte Ratios are Associated with Greater Risk of Hemorrhagic Transformation in Patients with Acute Ischemic Stroke. *Current neurovascular research*, 15(4), 326–335. <https://doi.org/10.2174/1567202616666181204122457>
- Stoll, G., & Nieswandt, B. (2019). Thrombo-inflammation in acute ischaemic stroke - implications for treatment. *Nature reviews. Neurology*, 15(8), 473–481. <https://doi.org/10.1038/s41582-019-0221-1>
- Sun, L., Su, Y., Jiao, A., Wang, X., & Zhang, B. (2023). T cells in health and disease. *Signal transduction and targeted therapy*, 8(1), 235. <https://doi.org/10.1038/s41392-023-01471-y>
- Tadi, P. dan Lui, F. (2023) . Stroke akut. StatPearls [daring]. Treasure Island (FL): StatPearls Publishing. Tersedia di:  
<https://www.ncbi.nlm.nih.gov/books/NBK535369/> [Diakses pada 2 Juni 2025].
- Tandiono, M., Edison, R.E., & Suhartomi. (2023). Neutrophil Lymphocyte Ratio of Ischemic Stroke Based on Region of Lesion. *Jurnal Kesehatan*, 14(3), 142-147. <http://dx.doi.org/10.35730/jk.v14i3.1026>
- Tarumi, T., & Zhang, R. (2018). Cerebral blood flow in normal aging adults: cardiovascular determinants, clinical implications, and aerobic fitness. *Journal of neurochemistry*, 144(5), 595–608. <https://doi.org/10.1111/jnc.14234>

- Taylor, R. A., Chang, C. F., Goods, B. A., Hammond, M. D., Mac Grory, B., Ai, Y., et al. (2017). TGF- $\beta$ 1 modulates microglial phenotype and promotes recovery after intracerebral hemorrhage. *The Journal of clinical investigation*, 127(1), 280–292. <https://doi.org/10.1172/JCI88647>
- Tie, Y., Tang, F., Peng, D., Zhang, Y., & Shi, H. (2022). TGF-beta signal transduction: biology, function and therapy for diseases. *Molecular Biomedicine*, 3, 45. <https://doi.org/10.1186/s43556-022-00109-9>
- Tudor, R., Iovanescu, G., Reisz, D., Cornea, A., Potre-Oncu, C., Tutelca, A., & Simu, M. (2020). Additional factors to correlate with a more than 30% NIHSS score improvement in patients 7 days after fibrinolytic and/or endovascular treatment for ischemic stroke. *BMC neurology*, 20(1), 417. <https://doi.org/10.1186/s12883-020-01990-z>
- Venketasubramanian, N., Yoon, B. W., Pandian, J., & Navarro, J. C. (2017). Stroke Epidemiology in South, East, and South-East Asia: A Review. *Journal of stroke*, 19(3), 286–294. <https://doi.org/10.5853/jos.2017.00234>
- Venketasubramanian, N., Yudiarto, F. L., & Tugasworo, D. (2022). Stroke Burden and Stroke Services in Indonesia. *Cerebrovascular diseases extra*, 12(1), 53–57. <https://doi.org/10.1159/000524161>
- Viasus, D., Simonetti, A. F., Estupiñan-Bohórquez, A. F., & Carratalà, J. (2021). Effects of age and comorbidities on serum levels of inflammatory markers in community-acquired pneumonia. *European journal of clinical investigation*, 51(6), e13480. <https://doi.org/10.1111/eci.13480>
- Wang, C., Zhang, Q., Ji, M., Mang, J., & Xu, Z. (2021). Prognostic value of the neutrophil-to-lymphocyte ratio in acute ischemic stroke patients treated with intravenous thrombolysis: a systematic review and meta-analysis. *BMC neurology*, 21(1), 191. <https://doi.org/10.1186/s12883-021-02222-8>
- Wang, Z., Zhang, W., Chen, L., Lu, X., & Tu, Y. (2024). Lymphopenia in sepsis: a narrative review. *Critical care (London, England)*, 28(1), 315. <https://doi.org/10.1186/s13054-024-05099-4>
- Wen, H., Tan, J., Tian, M., Wang, Y., Gao, Y., & Gong, Y. (2023). TGF- $\beta$ 1 ameliorates BBB injury and improves long-term outcomes in mice after ICH. *Biochemical and biophysical research communications*, 654, 136–144. <https://doi.org/10.1016/j.bbrc.2023.03.007>

- Widjaja, K. K., Chulavatnatol, S., Suansanae, T., Wibowo, Y. I., Sani, A. F., Islamiyah, W. R., et al. (2021). Knowledge of stroke and medication adherence among patients with recurrent stroke or transient ischemic attack in Indonesia: a multi-center, cross-sectional study. *International journal of clinical pharmacy*, 43(3), 666–672. <https://doi.org/10.1007/s11096-020-01178-y>
- Wu, B., Liu, F., Sun, G., & Wang, S. (2023). Prognostic role of dynamic neutrophil-to-lymphocyte ratio in acute ischemic stroke after reperfusion therapy: A meta-analysis. *Frontiers in neurology*, 14, 1118563.
- Wu, Q., Chen, H. S. (2023). Neutrophil-to-lymphocyte ratio and its changes predict the 3-month outcome and mortality in acute ischemic stroke patients after intravenous thrombolysis. *Brain and behavior*, 13(9), e3162. <https://doi.org/10.1002/brb3.3162>
- Wu, Z., Zeng, M., Li, C., Qiu, H., Feng, H., Xu, X., Zhang, H., & Wu, J. (2019). Time-dependence of NIHSS in predicting functional outcome of patients with acute ischemic stroke treated with intravenous thrombolysis. *Postgraduate medical journal*, 95(1122), 181–186. <https://doi.org/10.1136/postgradmedj-2019-136398>
- Xie, J., Pang, C., Yu, H., Zhang, W., Ren, C., & Deng, B. (2022). Leukocyte indicators and variations predict worse outcomes after intravenous thrombolysis in patients with acute ischemic stroke. *Journal of Cerebral Blood Flow & Metabolism*, 43(3), 393–403. <https://doi.org/10.1177/0271678X221142694>
- Yafasova, A., Fosbøl, E. L., Johnsen, S. P., Kruuse, C., Petersen, J. K., Alhakak, A., et al. (2021). Time to Thrombolysis and Long-Term Outcomes in Patients With Acute Ischemic Stroke: A Nationwide Study. *Stroke*, 52(5), 1724–1732. <https://doi.org/10.1161/STROKEAHA.120.032837>
- Yang, M., Yoo, H., Kim, S. Y., Kwon, O., Nam, M. W., Pan, K. H., et al. (2023). Occupational Risk Factors for Stroke: A Comprehensive Review. *Journal of stroke*, 25(3), 327–337. <https://doi.org/10.5853/jos.2023.01011>
- Yeo, L. L., Paliwal, P., Teoh, H. L., Seet, R. C., Chan, B. P., Wakerley, B., et al. (2013). Early and continuous neurologic improvements after intravenous thrombolysis are strong predictors of favorable long-term outcomes in acute ischemic stroke. *Journal of stroke and cerebrovascular diseases*, 22(8), e590–e596. <https://doi.org/10.1016/j.jstrokecerebrovasdis.2013.07.024>
- Yi, X., Luo, H., Zhou, J., Yu, M., Chen, X., Tan, L., et al. (2020). Prevalence of stroke

- and stroke related risk factors: a population based cross sectional survey in southwestern China. *BMC neurology*, 20(1), 5. <https://doi.org/10.1186/s12883-019-1592-z>
- Ying, Y., Yu, F., Luo, Y., Feng, X., Liao, D., Wei, M., et al. (2021). Neutrophil-to-Lymphocyte Ratio as a Predictive Biomarker for Stroke Severity and Short-Term Prognosis in Acute Ischemic Stroke With Intracranial Atherosclerotic Stenosis. *Frontiers in neurology*, 12, 705949. <https://doi.org/10.3389/fneur.2021.705949>
- You, S., Wang, Y., Wang, X., Maeda, T., Ouyang, M., Han, Q., et al. (2024). Twenty-Four-Hour Post-Thrombolysis NIHSS Score As the Strongest Prognostic Predictor After Acute Ischemic Stroke: ENCHANTED Study. *Journal of the American Heart Association*, 13(18), e036109. <https://doi.org/10.1161/JAHA.124.036109>
- Yousufuddin, M., & Young, N. (2019). Aging and ischemic stroke. *Aging*, 11(9), 2542–2544. <https://doi.org/10.18632/aging.101931>
- Yu, S., Arima, H., Bertmar, C., Clarke, S., Herkes, G., & Krause, M. (2018). Neutrophil to lymphocyte ratio and early clinical outcomes in patients with acute ischemic stroke. *Journal of the neurological sciences*, 387, 115–118. <https://doi.org/10.1016/j.jns.2018.02.002>
- Yu, Y., Li, J., Zhou, H., Xiong, Y., Wen, Y., & Li, H. (2018). Functional importance of the TGF- $\beta$ 1/Smad3 signaling pathway in oxygen-glucose-deprived (OGD) microglia and rats with cerebral ischemia. *International journal of biological macromolecules*, 116, 537–544. <https://doi.org/10.1016/j.ijbiomac.2018.04.113>
- Zahorec R. (2021). Neutrophil-to-lymphocyte ratio, past, present and future perspectives. *Bratislavské lekarske listy*, 122(7), 474–488. [https://doi.org/10.4149/BLL\\_2021\\_078](https://doi.org/10.4149/BLL_2021_078)
- Zhang, R., Wu, X., Hu, W., Zhao, L., Zhao, S., Zhang, J., et al. (2019). Neutrophil-to-lymphocyte ratio predicts hemorrhagic transformation in ischemic stroke: A meta-analysis. *Brain and behavior*, 9(9), e01382. <https://doi.org/10.1002/brb3.1382>
- Zhang, Y., & Yang, X. (2020). The Roles of TGF- $\beta$  Signaling in Cerebrovascular Diseases. *Frontiers in cell and developmental biology*, 8, 567682. <https://doi.org/10.3389/fcell.2020.567682>
- Zhang, Y., Yang, W., Li, W., & Zhao, Y. (2021). NLRP3 Inflammasome: Checkpoint Connecting Innate and Adaptive Immunity in Autoimmune Diseases. *Frontiers in immunology*, 12, 732933. <https://doi.org/10.3389/fimmu.2021.732933>

Zhao, X. J., Li, Q. X., Liu, T. J., Wang, D. L., An, Y. C., Zhang, J., Peng, Y. B., Chen, R. Y., Chang, L. S., Wang, Y., Zhang, L., Fan, H. Y., Wang, X. J., & Zheng, F. X. (2018). Predictive values of CSS and NIHSS in the prognosis of patients with acute cerebral infarction: A comparative analysis. *Medicine*, 97(39), e12419. <https://doi.org/10.1097/MD.00000000000012419>

Zhu, F., Ji, Y., Song, J. H., Huang, G. X., & Zhang, Y. F. (2023). Correlations between NLR, NHR, and clinicopathological characteristics, and prognosis of acute ischemic stroke. *Medicine*, 102(24), e33957. <https://doi.org/10.1097/MD.00000000000033957>

Zhu, H., Gui, Q., Hui, X., Wang, X., Jiang, J., Ding, L., et al. (2017). TGF- $\beta$ 1/Smad3 Signaling Pathway Suppresses Cell Apoptosis in Cerebral Ischemic Stroke Rats. *Medical science monitor*, 23, 366–376. <https://doi.org/10.12659/msm.899195>

Zivancevic-Simonovic, S., Minic, R., Cupurdija, V., Stanojevic-Pirkovic, M., Milosevic-Djordjevic, O., Jakovljevic, V., et al. (2023). Transforming growth factor beta 1 (TGF- $\beta$ 1) in COVID-19 patients: relation to platelets and association with the disease outcome. *Molecular and cellular biochemistry*, 478(11), 2461–2471. <https://doi.org/10.1007/s11010-023-04674-7>

