

REFERENCE

- Abensur Vuillaume, L., Le Borgne, P., Alamé, K., Lefebvre, F., Bérard, L., Delmas, N., Cipolat, L., Gennai, S., Bilbault, P. and Lavoignet, C.-E. (2021). Neutrophil-to-Lymphocyte Ratio and Early Variation of NLR to Predict In-Hospital Mortality and Severity in ED Patients with SARS-CoV-2 Infection. *Journal of Clinical Medicine*, [online] 10(12), p.2563. doi:<https://doi.org/10.3390/jcm10122563>.
- Agrawal, N., Kumar Agrawal, M., Kumari, T. and Kumar, S. (2017). Correlation between Body Mass Index and Blood Glucose Levels in Jharkhand Population. *International Journal of Contemporary Medical Research ISSN*, [online] 4, p.1633. Available at: http://www.ijcmr.com/uploads/7/7/4/6/77464738/ijcmr_1592.pdf [Accessed 28 May 2023].
- Al-Kuraishy, H.M., Al-Gareeb, A.I., Alblihed, M., Guerreiro, S.G., Cruz-Martins, N. and Batiha, G.E.-S. (2021). COVID-19 in Relation to Hyperglycemia and Diabetes Mellitus. *Frontiers in Cardiovascular Medicine*, [online] 8, p.644095. doi:<https://doi.org/10.3389/fcvm.2021.644095>.
- American Diabetes Association (n.d.). *Exercise Can Raise Blood Glucose (Blood Sugar) | ADA*. [online] diabetes.org. Available at: <https://diabetes.org/healthy-living/fitness/why-does-exercise-sometimes-raise-blood-sugar> [Accessed 25 May 2023].
- Andiani, F., Herawati, R. and Triyani, Y. (2023). Correlation between NLR and PLR with the Severity of COVID-19 Inpatients. *INDONESIAN JOURNAL OF CLINICAL PATHOLOGY AND MEDICAL LABORATORY*, 29(1), pp.47–53. doi:<https://doi.org/10.24293/ijcpml.v29i1.1924>.
- Bhalerao, S. and Kadam, P. (2010). Sample size calculation. *International Journal of Ayurveda Research*, [online] 1(1), p.55. doi:<https://doi.org/10.4103/0974-7788.59946>.
- Blendea, M.C., Thompson, M.J. and Malkani, S. (2010). Diabetes and Chronic Liver Disease: Etiology and Pitfalls in Monitoring. *Clinical Diabetes*, [online] 28(4), pp.139–144. doi:<https://doi.org/10.2337/diaclin.28.4.139>.
- Borkute, R.R., Woelke, S., Pei, G. and Dorhoi, A. (2021). Neutrophils in Tuberculosis: Cell Biology, Cellular Networking and Multitasking in Host

- Defense. *International Journal of Molecular Sciences*, [online] 22(9), p.4801. doi:<https://doi.org/10.3390/ijms22094801>.
- Cevik, M., Kuppalli, K., Kindrachuk, J. and Peiris, M. (2020). Virology, transmission, and pathogenesis of SARS-CoV-2. *BMJ*, [online] 371(371). doi:<https://doi.org/10.1136/bmj.m3862>.
- Chang, S.-C. and Yang, W.-C.V. (2016). Hyperglycemia, tumorigenesis, and chronic inflammation. *Critical Reviews in Oncology/Hematology*, [online] 108, pp.146–153. doi:<https://doi.org/10.1016/j.critrevonc.2016.11.003>.
- Chatterjee, S. (2016). *Chapter Two - Oxidative Stress, Inflammation, and Disease*. [online] ScienceDirect. Available at: <https://www.sciencedirect.com/science/article/pii/B9780128032695000024> [Accessed 31 Dec. 2022].
- DeMarco, C. (2021). *Diabetes as a side effect of cancer treatment: 8 things to know*. [online] MD Anderson Cancer Center. Available at: <https://www.mdanderson.org/cancerwise/diabetes-as-a-side-effect-of-cancer-treatment--8-things-to-know.h00-159464001.html#:~:text=Often%2C%20diabetes%20develops%20on%20its> [Accessed 25 May 2023].
- Diegelmann, R.F. (2003). Excessive neutrophils characterize chronic pressure ulcers. *Wound Repair and Regeneration*, [online] 11(6), pp.490–495. doi:<https://doi.org/10.1046/j.1524-475x.2003.11617.x>.
- Doğan, A. and Demircioğlu, S. (2019). Assessment of the Neutrophil-Lymphocyte Ratio in Classic Hodgkin Lymphoma Patients. *Pakistan Journal of Medical Sciences*, [online] 35(5). doi:<https://doi.org/10.12669/pjms.35.5.601>.
- Duan, W., Shen, X., Lei, J., Xu, Q., Yu, Y., Li, R., Wu, E. and Ma, Q. (2014). Hyperglycemia, a Neglected Factor during Cancer Progression. *BioMed Research International*, [online] 2014, pp.1–10. doi:<https://doi.org/10.1155/2014/461917>.
- Elara Care (2023). *Does the Menstrual Cycle Affect Glucose Levels?* [online] Elara Care. Available at: <https://elara.care/hormones/relationship-between-menstrual-cycle-and-blood-sugar/> [Accessed 27 May 2023].
- Fahie, K.M.M., Papanicolaou, K.N. and Zachara, N.E. (2022). Integration of O-GlcNAc into Stress Response Pathways. *Cells*, [online] 11(21), p.3509. doi:<https://doi.org/10.3390/cells11213509>.
- Falcone, M., Meier, J.J., Marini, M.G., Caccialanza, R., Aguado, J.M., Del Prato, S. and Menichetti, F. (2021). Diabetes and acute bacterial skin and skin structure infections. *Diabetes Research and Clinical Practice*, 174, p.108732. doi:<https://doi.org/10.1016/j.diabres.2021.108732>.
- Farkas, J. (2019). *PulmCrit: Neutrophil-Lymphocyte Ratio (NLR): Free upgrade to your WBC*. [online] EMCrit Project. Available at: <https://emcrit.org/pulmcrit/nlr/> [Accessed 28 Dec. 2022].
- Frazzei, G., van Vollenhoven, R.F., de Jong, B.A., Siegelaar, S.E. and van Schaardenburg, D. (2022). Preclinical Autoimmune Disease: a Comparison of Rheumatoid Arthritis, Systemic Lupus Erythematosus, Multiple Sclerosis and

- Type 1 Diabetes. *Frontiers in Immunology*, [online] 13. doi:<https://doi.org/10.3389/fimmu.2022.899372>.
- Fu, X., Liu, H., Huang, G. and Dai, S. (2021). The emerging role of neutrophils in autoimmune-associated disorders: effector, predictor, and therapeutic targets. *MedComm*, [online] 2(3), pp.402–413. doi:<https://doi.org/10.1002/mco2.69>.
- Giacco, F. and Brownlee, M. (2010). Oxidative Stress and Diabetic Complications. *Circulation Research*, [online] 107(9), pp.1058–1070. doi:<https://doi.org/10.1161/circresaha.110.223545>.
- Gyawali, B., Ramakrishna, K. and Dhamoon, A.S. (2019). Sepsis: the Evolution in Definition, Pathophysiology, and Management. *SAGE Open Medicine*, [online] 7(7). doi:<https://doi.org/10.1177/2050312119835043>.
- Handayani, K., Katu, S., Bakri, S., Halim, R., Aman, A.M., Rasyid, H., Kasim, H. and Seweng, A. (2020). *Correlation of CD4 Count and Neutrophil Lymphocyte Ratio in Human Immunodeficiency Virus-Acquired Immunodeficiency Syndrome (HIV/AIDS) Patients*. [online] Available at: https://ejmcm.com/article_3388_6041ce62d0e7d2958dcd0441d3b74277.pdf [Accessed 25 May 2023].
- Hariati, H., Suza, D.E. and Tarigan, R. (2019). Risk Factors Analysis for Catheter-Associated Urinary Tract Infection in Medan, Indonesia. *Open Access Macedonian Journal of Medical Sciences*, [online] 7(19), pp.3189–3194. doi:<https://doi.org/10.3889/oamjms.2019.798>.
- Hershko Klement, A., Hadi, E., Asali, A., Shavit, T., Wisner, A., Haikin, E., Barkan, Y., Biron-Shental, T., Zer, A. and Gadot, Y. (2018). Neutrophils to lymphocytes ratio and platelets to lymphocytes ratio in pregnancy: A population study. *PLOS ONE*, [online] 13(5), p.e0196706. doi:<https://doi.org/10.1371/journal.pone.0196706>.
- Hussain, S., Baxi, H., Jamali, M.C., Nisar, N. and Hussain, S. (2020). Burden of diabetes mellitus and its impact on COVID-19 patients: A meta-analysis of real-world evidence. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, [online] 14(6), pp.1595–1602. doi:<https://doi.org/10.1016/j.dsx.2020.08.014>.
- Imtiaz, F., Shafique, K., Mirza, S., Ayoob, Z., Vart, P. and Rao, S. (2012). Neutrophil lymphocyte ratio as a measure of systemic inflammation in prevalent chronic diseases in Asian population. *International Archives of Medicine*, [online] 5(1), p.2. doi:<https://doi.org/10.1186/1755-7682-5-2>.
- Ince, N., Ertugrul Guclu, Mehmet Ali Sungur and Oguz Karabay (2020). Evaluation of neutrophil to lymphocyte ratio, platelet to lymphocyte ratio, and lymphocyte to monocyte ratio in patients with cellulitis. *Evaluation of neutrophil to lymphocyte ratio, platelet to lymphocyte ratio, and lymphocyte to monocyte ratio in patients with cellulitis*, [online] 66(8), pp.1077–1081. doi:<https://doi.org/10.1590/1806-9282.66.8.1077>.
- Jain, V. and Bhardwaj, A. (2022). *Pneumonia Pathology*. [online] Nih.gov. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK526116/>.
- Jensen, A.V., Egelund, G.B., Andersen, S.B., Trier Petersen, P., Benfield, T., Faurholt-Jepsen, D., Rohde, G. and Ravn, P. (2017). The impact of blood glucose on community-acquired pneumonia: a retrospective cohort study.

- ERJ Open Research*, [online] 3(2). doi:<https://doi.org/10.1183/23120541.00114-2016>.
- Jia, W.-Y. and Zhang, J.-J. (2022). Effects of glucocorticoids on leukocytes: Genomic and non-genomic mechanisms. *World Journal of Clinical Cases*, 10(21), pp.7187–7194. doi:<https://doi.org/10.12998/wjcc.v10.i21.7187>.
- Jimeno, S., Ventura, P.S., Castellano, J.M., García-Adasme, S.I., Miranda, M., Touza, P., Lllana, I. and López-Escobar, A. (2020). Prognostic implications of neutrophil-lymphocyte ratio in COVID-19. *European Journal of Clinical Investigation*, [online] 51(1). doi:<https://doi.org/10.1111/eci.13404>.
- Krafft, N. (2022). *Does Dehydration Cause High Blood Sugar? - Nutrisense Journal*. [online] www.nutrisense.io. Available at: <https://www.nutrisense.io/blog/does-dehydration-cause-high-blood-sugar> [Accessed 25 May 2023].
- Landstra, C.P. and de Koning, E.J.P. (2021). COVID-19 and Diabetes: Understanding the Interrelationship and Risks for a Severe Course. *Frontiers in Endocrinology*, [online] 12. doi:<https://doi.org/10.3389/fendo.2021.649525>.
- Leon-Abarca, J.A., Portmann-Baracco, A., Bryce-Alberti, M., Ruiz-Sánchez, C., Accinelli, R.A., Soliz, J. and Gonzales, G.F. (2021). Diabetes increases the risk of COVID-19 in an altitude dependent manner: An analysis of 1,280,806 Mexican patients. *PLOS ONE*, [online] 16(8), p.e0255144. doi:<https://doi.org/10.1371/journal.pone.0255144>.
- Li, J., Chen, Q., Luo, X., Hong, J., Pan, K., Lin, X., Liu, X., Zhou, L., Wang, H., Xu, Y., Li, H. and Duan, C. (2014). Neutrophil-to-Lymphocyte Ratio Positively Correlates to Age in Healthy Population. *Journal of Clinical Laboratory Analysis*, [online] 29(6), pp.437–443. doi:<https://doi.org/10.1002/jcla.21791>.
- Liang, M., Chen, Q., Zhang, Y., He, L., Wang, J., Cai, Y. and Li, L. (2016). Impact of diabetes on the risk of bed sore in patients undergoing surgery: an updated quantitative analysis of cohort studies. *Oncotarget*, [online] 8(9), pp.14516–14524. doi:<https://doi.org/10.18632/oncotarget.14312>.
- Liu, D., Jin, J., Zhang, L., Li, L., Song, J. and Li, W. (2018). The Neutrophil to Lymphocyte Ratio May Predict Benefit from Chemotherapy in Lung Cancer. *Cellular Physiology and Biochemistry*, [online] 46(4), pp.1595–1605. doi:<https://doi.org/10.1159/000489207>.
- Martínez-Murillo, C., Ramos Peñafiel, C., Basurto, L., Balcázar-Hernández, L., Pellón, K., Flores López, E., Li Gómez, B., Ledesma, M.E., Rivera Tapia, R., Madera Maldonado, E., Bejarano Rosales, M., Barranco Lampon, G. and Zazueta, J.F. (2021). COVID-19 in a country with a very high prevalence of diabetes: The impact of admission hyperglycaemia on mortality. *Endocrinology, Diabetes & Metabolism*, [online] 4(3). doi:<https://doi.org/10.1002/edm2.279>.
- Masuko, K. (2022). Glucose as a Potential Key to Fuel Inflammation in Rheumatoid Arthritis. *Nutrients*, [online] 14(11), p.2349. doi:<https://doi.org/10.3390/nu14112349>.

- Mathebula, S.D. (2015). Polyol pathway: A possible mechanism of diabetes complications in the eye. *African Vision and Eye Health*, [online] 74(1). doi:<https://doi.org/10.4102/aveh.v74i1.13>.
- Mirrakhimov, A.E. (2012). Chronic obstructive pulmonary disease and glucose metabolism: a bitter sweet symphony. *Cardiovascular Diabetology*, [online] 11(1), p.132. doi:<https://doi.org/10.1186/1475-2840-11-132>.
- Mouri, Mi. and Badireddy, M. (2019). *Hyperglycemia*. [online] National Library of Medicine. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK430900/>.
- NIH (2021). *Clinical Spectrum*. [online] COVID-19 Treatment Guidelines. Available at: <https://www.covid19treatmentguidelines.nih.gov/overview/clinical-spectrum/> [Accessed 17 Nov. 2022].
- Paneni, F., Beckman, J.A., Creager, M.A. and Cosentino, F. (2013). Diabetes and vascular disease: pathophysiology, clinical consequences, and medical therapy: part I. *European Heart Journal*, [online] 34(31), pp.2436–2443. doi:<https://doi.org/10.1093/eurheartj/eh149>.
- Paneque, A., Fortus, H., Zheng, J., Werlen, G. and Jacinto, E. (2023). The Hexosamine Biosynthesis Pathway: Regulation and Function. *Genes*, [online] 14(4), p.933. doi:<https://doi.org/10.3390/genes14040933>.
- Parrettini, S., Caroli, A. and Torlone, E. (2020). Nutrition and Metabolic Adaptations in Physiological and Complicated Pregnancy: Focus on Obesity and Gestational Diabetes. *Frontiers in Endocrinology*, 11. doi:<https://doi.org/10.3389/fendo.2020.611929>.
- Pechous, R.D. (2017). With Friends Like These: The Complex Role of Neutrophils in the Progression of Severe Pneumonia. *Frontiers in Cellular and Infection Microbiology*, 7. doi:<https://doi.org/10.3389/fcimb.2017.00160>.
- Peeling, R.W., Heymann, D.L., Teo, Y.-Y. and Garcia, P.J. (2021). Diagnostics for COVID-19: moving from pandemic response to control. *The Lancet*, [online] pp.757–768. doi:[https://doi.org/10.1016/s0140-6736\(21\)02346-1](https://doi.org/10.1016/s0140-6736(21)02346-1).
- Petrakis, V., Panagopoulos, P., Trypsianis, G., Papazoglou, D. and Papanas, N. (2023). Fasting Plasma Glucose Increase and Neutrophil-to-Lymphocyte Ratio as Risk Predictors of Clinical Outcome of COVID-19 Pneumonia in Type 2 Diabetes Mellitus. *Experimental and Clinical Endocrinology & Diabetes: Official Journal, German Society of Endocrinology [and] German Diabetes Association*, [online] 131(4), pp.194–197. doi:<https://doi.org/10.1055/a-2009-6937>.
- Petrie, J.R., Guzik, T.J. and Touyz, R.M. (2018). Diabetes, Hypertension, and Cardiovascular Disease: Clinical Insights and Vascular Mechanisms. *The Canadian journal of cardiology*, [online] 34(5), pp.575–584. doi:<https://doi.org/10.1016/j.cjca.2017.12.005>.
- Riise, H.K.R., Igland, J., Sulo, G., Graue, M., Haltbakk, J., Tell, G.S. and Iversen, M.M. (2021). Casual blood glucose and subsequent cardiovascular disease and all-cause mortality among 159 731 participants in Cohort of Norway (CONOR). *BMJ Open Diabetes Research & Care*, [online] 9(1), p.e001928. doi:<https://doi.org/10.1136/bmjdr-2020-001928>.

- Roberts, A.C. and Porter, K.E. (2013). Cellular and molecular mechanisms of endothelial dysfunction in diabetes. *Diabetes and Vascular Disease Research*, [online] 10(6), pp.472–482. doi:<https://doi.org/10.1177/1479164113500680>.
- Rohini, K., Surekha Bhat, M., Srikumar, P.S. and Mahesh Kumar, A. (2015). Assessment of Hematological Parameters in Pulmonary Tuberculosis Patients. *Indian Journal of Clinical Biochemistry*, [online] 31(3), pp.332–335. doi:<https://doi.org/10.1007/s12291-015-0535-8>.
- Rosales, C. (2018). Neutrophil: A Cell with Many Roles in Inflammation or Several Cell Types? *Frontiers in Physiology*, [online] 9(113). doi:<https://doi.org/10.3389/fphys.2018.00113>.
- Sacks, E. (2021). *Meds That Can Spike Your Blood Sugar*. [online] WebMD. Available at: <https://www.webmd.com/diabetes/medicines-blood-sugar-spike> [Accessed 27 May 2023].
- Sechterberger, M.K., Hutten, B.A., Jeroen Hermanides, Cohn, D.M., Joost, Pieter Willem Kamphuisen and J. Hans DeVries (2012). The incidence of diabetes mellitus following pulmonary embolism: a retrospective cohort study. *Journal of Thrombosis and Haemostasis*, [online] 10(12), pp.2628–2630. doi:<https://doi.org/10.1111/jth.12029>.
- Sharma, S., Krishnappa, D., Singh, A., Sinha, S., Ammini, A. and Soneja, M. (2019). Impact of tuberculosis on glycaemic status: A neglected association. *Indian Journal of Medical Research*, 149(3), p.384. doi:https://doi.org/10.4103/ijmr.ijmr_1927_17.
- Shen, Y., Wang, Z., Liu, L., Zhang, R., Zheng, Y. and Lu, H. (2013). Prevalence of hyperglycemia among adults with newly diagnosed HIV/AIDS in China. *BMC Infectious Diseases*, [online] 13(1). doi:<https://doi.org/10.1186/1471-2334-13-79>.
- Singh, K. (2010). Leucocyte counts in anaemia. *Indian Journal of Physiology and Pharmacology*, [online] 54(1), pp.85–88. Available at: <https://pubmed.ncbi.nlm.nih.gov/21046926/#full-view-affiliation-1> [Accessed 11 Jun. 2023].
- Soltani, M., Zhao, Y., Xia, Z., Ganjalikhani Hakemi, M. and Bazhin, A.V. (2021). The Importance of Cellular Metabolic Pathways in Pathogenesis and Selective Treatments of Hematological Malignancies. *Frontiers in Oncology*, 11. doi:<https://doi.org/10.3389/fonc.2021.767026>.
- Spollett, G.R. (2006). Hyperglycemia in HIV/AIDS. *Diabetes Spectrum*, [online] 19(3), pp.163–166. doi:<https://doi.org/10.2337/diaspect.19.3.163>.
- Surendra, H., Elyazar, I.R., Djaafara, B.A., Ekawati, L.L., Saraswati, K., Adrian, V., Widyastuti, Oktavia, D., Salama, N., Lina, R.N., Andrianto, A., Lestari, K.D., Burhan, E., Shankar, A.H., Thwaites, G., Baird, J.K. and Hamers, R.L. (2021). Clinical characteristics and mortality associated with COVID-19 in Jakarta, Indonesia: A hospital-based retrospective cohort study. *The Lancet Regional Health - Western Pacific*, [online] 9, p.100108. doi:<https://doi.org/10.1016/j.lanwpc.2021.100108>.
- Territo, M. (2018). *Lymphocytopenia*. [online] MSD Manual Consumer Version. Available at: <https://www.msdmanuals.com/home/blood-disorders/white-blood-cell-disorders/lymphocytopenia> [Accessed 27 Dec. 2022].

- Toori, K.U., Qureshi, M.A., Chaudhry, A. and Safdar, M.F. (2021). Neutrophil to lymphocyte ratio (NLR) in COVID-19: A cheap prognostic marker in a resource constraint setting. *Pakistan Journal of Medical Sciences*, [online] 37(5). doi:<https://doi.org/10.12669/pjms.37.5.4194>.
- Triyono, E.A., Wahyuhadi, J., Prajitno, J.H., Novida, H., Siagian, N., Cahyani, C., Putri, A.T., Lusida, M.A.P., Hidayat, A.A., Idamusaga, K.S., Intansari, N.I., Asmara, J., Hadi, A. and Bandem, I.K.M.P. (2022). Clinical characteristics and outcomes of hospitalized COVID-19 patients with diabetes mellitus in East Java, Indonesia: A cross-sectional study. *F1000Research*, [online] 11, p.684. doi:<https://doi.org/10.12688/f1000research.111047.1>.
- Tzeng, H.-T. and Chyuan, I-Tsu. (2021). Immunometabolism in systemic lupus erythematosus: Relevant pathogenetic mechanisms and potential clinical applications. *Journal of the Formosan Medical Association*, [online] 120(9), pp.1667–1675. doi:<https://doi.org/10.1016/j.jfma.2021.03.019>.
- Wernly, B., Lichtenauer, M., Hoppe, U.C. and Jung, C. (2016). Hyperglycemia in septic patients: an essential stress survival response in all, a robust marker for risk stratification in some, to be messed with in none. *Journal of Thoracic Disease*, [online] 8(7), pp.E621–E624. doi:<https://doi.org/10.21037/jtd.2016.05.24>.
- WHO (2006). *definition and diagnosis of diabetes mellitus and intermediate hyperglycemia RepoRt of a WHO/IDf ConsultatIon*. [online] World Health Organization. Available at: http://apps.who.int/iris/bitstream/handle/10665/43588/9241594934_eng.pdf?sequence=1 [Accessed 17 Jan. 2023].
- WHO (2022). *Coronavirus disease (COVID-19)*. [online] World Health Organization. Available at: https://www.who.int/health-topics/coronavirus#tab=tab_1 [Accessed 17 Nov. 2022].
- World Health Organization (n.d.). *Indonesia: WHO Coronavirus Disease (COVID-19) Dashboard*. [online] covid19.who.int. Available at: <https://covid19.who.int/region/searo/country/id> [Accessed 17 Apr. 2023].
- Zhou, H., Zhang, X. and Lu, J. (2014). Progress on diabetic cerebrovascular diseases. *Bosnian Journal of Basic Medical Sciences*, [online] 14(4), pp.185–190. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4333964/> [Accessed 5 Jun. 2023].