DAFTAR PUSTAKA

Abbas, A.K., Lichtman AH, Pillai S. 2012. Cellular and molecular immunology. 7th Ed., Philadelphia, *Saunders Elsevier*, 43-57.

Akobeng, A.K. 2007. Understanding diagnostic tests 3: receiver operating characteristic curves. *Acta Pædiatrica*. 96; 644–647.

Alghoula, F., Albagoush, S., Buaisha, H., Walters, R., Highley, A., Gbadamosiakindele, M. 2019. Anemia as a prognostic factor in patients with severe sepsis and septic shock. Diakses 27 Januari 2021 dari https://doi.org/10.1016/j.chest.2019.08.961

Alvarado, M.L., Mijangos-Huesca, F.J. Terán-González, J.O., Lagunas-Alvarado, M.G.,Martínez-Zavala, N., Reyes-Franco, I., *et al.*, 2017. Systemic immune inflammatory index in sepsis. Medicina Interna de Mexico. 33. 303-309.

Angus DC, Linde-Zwirble WT, Lidicker J, Clermont G, Carcillo J, Pinsky MR. 2001. Epidemiology of severe sepsis in the United States: analysis of incidence outcome and associated costs of care. *Critical care medicine*. 29(7):1303–1310.

Anjani, A., Asdie, RH., Wijisaksono, DP. 2021. HALP score as a prognostic of mortality in septic patients at Dr. Sardjito Hospital. Diakses pada 30 Mei 2022 dari http://etd.repository.ugm.ac.id/penelitian/detail/197525

Angus, D.C., & van der Poll, T., 2013. Severe sepsis and septic shock. *N Engl J Med.* 369(9):840-851.

Annane, D., Bellissant, E., & Cavaillon, J.M., 2005. Septic shock. *Lancet.* 365:63-78.

Arabi YM, Dara SI, Tamim HM, Rishu AH, Bouchama A, Khedr MK, *et al.*, 2013. Clinical characteristics, sepsis interventions and outcomes in the obese patients with septic shock: an international multicenter cohort study. *Crit Care* 2013, 17:R72.

Artero, A., Zaragoza, R., Camarena, J.J., Sancho, S., Gonzalez, R., Noguiera, J.M., 2010. Prognostic factors of mortality in patients with community acquired blood stream infection with severe sepsis and septic shock. *Journal of Critical Care*. 25:276-281.

Aryana, I.G.P.S., Biran, S. I. 2006. Konsep baru kortikosteroid pada penanganan sepsis. *Dexa Media* 4:177-181.

Assinger, A., Schrottmaier, W.C, Salzmann, M., & Rayes, J. 2019. Platelets in sepsis: an update on experimental models and clinical data. *Front. Immunol.* 10:1687.

Bateman, R.M., Sharpe, M.D., Singer, M., & Ellis, C.G. 2017. The effect of sepsis on the erythrocyte. *Int. J. Mol. Sci*. 18:1932.

Bone, R.C., Balk, R.A., Cerra, F.B., Dellinger, R.P., Fein, A.M., Knaus, W.A., *et al.* 1992. American College of Chest Physicians/Society of Critical Care Medicine Consensus Conference Committee: Definitions for sepsis and organ failure and guidelines for the use of innovative therapies in sepsis. *Crit Care Med.* 20:864-874.

Bonilla, F.A., & Oettgen, H.C., 2010. Adaptive Immunity. *J Allergy Clin Immunol*. 125:S33-40.

Boomer JS, Green JM, Hotchkiss RS. The changing immune system in sepsis: is individualized immuno-modulatory therapy the answer? *Virulence*. 2014 Jan 1;5(1):45-56.

Boomer JS, To K, Chang KC 2011. Immunosuppression in patients who die of sepsis and multiple organ failure. *JAMA* 306:2594–605.

Cao, C., Yu, M. and Chai, Y. (2019) 'Pathological alteration and therapeutic implications of sepsis-induced immune cell apoptosis', Cell Death & Disease, 10(10), p. 782.

Cecconi M, Evans L, Levy M, Rhodes A. 2018 Sepsis and septic shock. *Lancet* 392:75–87.

Chaplin, D.D. 2010. Overview of the immune response. *J Allergy Clin Immunol*. 125:S3-23

Chen, X. H, Yin, Y.J., & Zhang, X.J., 2011. Sepsis and immune response, *World J EmergMe*. 2:2.

Chen C, Gu L, Chen L, Hu W, Feng X, Qiu F, *et al*., 2021 Neutrophil-to-Lymphocyte Ratio and Platelet-to-Lymphocyte Ratio as Potential Predictors of Prognosis in Acute Ischemic Stroke. *Front Neurol*. Jan 25;11:525621.

Chen, X. L, Xue, L., Wang, W., Chen, HN, Zhang, WH., Liu, K., *et al*. 2015. Prognostic significance of the combination of preoperative hemoglobin, albumin, lymphocyte and platelet in patients with gastric carcinoma: a retrospective cohort study. *Oncotarget*. 6:38.

Chung, K.P., Chang, H.T., Lo, S.C., Chang, L.Y., Lin, S.Y., Cheng, A., *et al*., 2015. Severe lymphopenia is associated with elevated plasma interleukin-15 levels and increased mortality during severe sepsis. *Shock*. 43:569–575.

Condotta, S.A., Cabrera-Perez, J., Badovinac, V.P., & Griffith, T.S. 2013. T-cell mediated immunity and the role of TRAIL in sepsis-induced immunosuppression. *Crit Rev Immunol*. 33 (1):23-40.

de Jager CP, Wever PC, Gemen EF, Kusters R, van Gageldonk-Lafeber AB, van der Poll T, *et al*. 2012. The neutrophil-lymphocyte count ratio in patients with community-acquired pneumonia. *PLoS One*. 7(10):e46561.

de Jager, C., van Wijk, P., Mathoera, R.B., de Jongh-Leuvenink, J., van der Poll, T., & Wever, P.C., 2010. Lymphocytopenia and neutrophil-lymphocyte count ratio predict bacteremia better than conventional infection markers in an emergency care unit. *Critical Care*. 14(5):192.

Dellinger, R.P., Levy, M.M., Rhodes, A., Annane, D., Gerlach, H., Opal, S.M, *et al*. 2012. Surviving sepsis campaign: international guidelines for management of severe sepsis and septic shock, *Intensive care medicine*. 39(2):165–228.

Dellinger, R.P., Levy, M.M., Rhodes, A., Annane, D., Gerlach, H., Opal, S.M, *et al*. 2013. Surviving sepsis campaign: international guidelines for management of severe sepsis and septic shock: 2012. *Crit Care Med*. 41(2):580-637

Dupont, W. and W. D. Plummer. "Power and sample size calculations. A review and computer program." *Controlled clinical trials* 11 2 (1990): 116-28 .

de Oliveira A, Cardoso C, Santos F, Campos AP, Leite E, Stanislaus J, *et al.* 2013 Predictors of mortality in patients with severe sepsis or septic shock in the ICU of a public teaching hospital. *Crit Care*. 17(Suppl 4):P31.

Delano MJ, Ward PA. 2016. Sepsis-induced immune dysfunction: can immune therapies reduce mortality? *J Clin Invest.* Jan;126(1):23-31.

Dilektasli E, Inaba K, Haltmeier T, 2016. The prognostic value of neutrophil-to-lymphocyte ratio on mortality in critically ill trauma patients. *J Trauma Acute Care Surg.* 81(5):882–888.

Deepak CL, Bhat S. 2014. Prediction of outcome in patients with sepsis using C reactive protein & APACHE II scoring system. *IOSR-JDMS.* 13(3):17-20.

Djordjevic D, Rondovic G, Surbatovic M. 2018. Neutrophil-to-Lymphocyte Ratio, Monocyte-to-Lymphocyte Ratio, Platelet-to-Lymphocyte Ratio, and Mean Platelet Volume-to-Platelet Count Ratio as Biomarkers in Critically Ill and Injured Patients: Which Ratio to Choose to Predict Outcome and Nature of Bacteremia? *Mediators Inflamm.* 3758068. Published 2018 Jul 15.

Drăgoescu, A., Pădureanu, V., Stanculescu, A., Chiuțu, L., Tomescu,P., Geormăneanu, *et al.*, 2021. Neutrophil to Lymphocyte Ratio (NLR)—A Useful Tool for the Prognosis of Sepsis in the ICU. *Biomedicines*. 10. 75. 10.3390/biomedicines10010075.

Drumheller BC, Agarwal A, Mikkelsen ME, Sante SC, Weber AL, Goyal M, *et al.,* 2016. Risk factors for mortality despite early protocolized resuscitation for severe sepsis and septic shock in the emergency department. *J Crit Care* 31:13-20.

Eldeen SS, Khalaf MM, Hadidy KE. 2012. Cardiac Troponin I as a Marker of Sepsis Severity and Mortality Prediction. *Med J Cairo Univ*. 80(2):167-72.

Evans L, Rhodes A, Alhazzani W, Antonelli M, Coopersmith CM, French C, *et al.*, 2021 Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021. *Intensive Care Med.* 2021 Nov;47(11):1181-1247.

Falagas ME, Kompoti M. Obesity and infection. *Lancet Infect Dis.* 2006 Jul;6(7):438-46. doi: 10.1016/S1473-3099(06)70523-0. PMID: 16790384.

Ferreira FL, Bota DP, Bross A, Mélot C, Vincent J. 2001. Serial Evaluation of the SOFA Score to Predict Outcome in Critically Ill Patients. *JAMA*. 286(14):1754–1758.

Feng JF, Wang L, Yang X. 2021. The preoperative hemoglobin, albumin, lymphocyte and platelet (HALP) score is a useful predictor in patients with resectable esophageal squamous cell carcinoma. *Bosn J Basic Med Sc* ; 21: 773-81.

Fleischmann, C., Thomas-Rueddel, D.O., Hartmann, N., Hartog, C.S., Welte, T., Heublein, S., et al., 2016. Hospital incidence and mortality rates of sepsis-an analysis of hospital episode (DRG) statistics in Germany from 2007 to 2013. *Deutsch Arzteb l Int*.113:159- 166.

Gao Y, Li Y, Yu X, Guo S, Ji X, Sun T, et al. 2014. The Impact of Various Platelet Indices as Prognostic Markers of Septic Shock. *PLoS ONE* 9(8): e103761.

Garcia-Rizo, C., Gernandez-Egea, E., Miller, B.J., Oliviera, C., Justicia, A., ` Griffith, J.K., et al. 2012. Abnormal glucose tolerance, white blood cellcount, and telomere length in newly diagnosed, antidepressant- naïve patients with depression. *Brain, Behavior and Immunity.* 28:49-53

Gauer, R.L., 2013. Early Recognition and Management of Sepsis in Adults: The First Six Hours. *Am Fam Physician*. 88(1):44-53.

Girardot, T., Rimmele, T., Venet, F., Monneret, G., 2017. Apoptosis-induced lymphopenia in sepsis and other severe injuries. *Apoptosis*. 22:295-305

Greco, E., Lupia, E., Bosco, O., Vizio, B., & Montrucchio, G. 2017. Platelets and multi-organ failure in sepsis. *Int. J. Mol*. Sci. 18:2000.

Guntur, A.H. 2009. Sepsis dalam *Buku Ajar Ilmu Penyakit Dalam.* Edisi ke 5, Jilid I, Interna. Publishing 2009. p 2889-95

Guo, Y., Shi, D., Zhang, J., Mao, S., Wang, L., Zhang, W., et al. 2019. The hemoglobin, albumin, lymphocyte, and platelet (HALP) score is a novel significant prognostic factor for patients with metastatic prostate cancer undergoing cytoreductive radical prostatectomy. *Journal of Cancer.* 10:81 91.

Gupta, L., & James, B.S. 2012. Hypoalbuminemia as a prognostic factor in sepsis, severe sepsis and septic shock. *Critical Care Medicine.* 40:12.

Hayden, S.J., Albert, T.J., Watkins, T.R., & Swenson, E.R. 2012. Anemia in critical illness: insights into etiology, consequences, and management. *Am J Respir Crit Care Med*. 185(10):1049–57

Ho KM, Dobb GJ, Knuiman M, Finn J, Lee KY, Webb SA. 2006. A comparison of admission and worst 24-hour Acute Physiology and Chronic Health Evaluation II scores in predicting hospital mortality: a retrospective cohort study. *Crit Care* 10:R4.

Hotchkiss, R.S., Tinsley, K.W., Swanson, P.E., Schmieg, R.E.Jr., Hui, J.J., Chang K.C., et al. 2001. Sepsis-induced apoptosis causes progressive profound depletion of B and CD4+ T lymphocytes in humans. *J Immunol*. 166:6952–6963.

Hotchkiss RS, Monneret G, Payen D. Sepsis-induced immunosuppression: from cellular dysfunctions to immunotherapy. *Nat Rev Immunol.* 2013 Dec;13(12):862-74. doi: 10.1038/nri3552. Epub 2013 Nov 15. PMID: 24232462; PMCID: PMC4077177.

Hu B, Yang XR, Xu Y, Sun YF, Sun C, Guo W, et al., 2014. Systemic immune-inflammation index predicts prognosis of patients after curative resection for hepatocellular carcinoma. *Clin Cancer Res*.Dec 1;20(23):6212-22.

Hutchins, N.A., Usinger, J., Hotchkiss, R.S., Ayala, A., 2014. The new normal: immunomodulatory agents against sepsis immune suppression. *Trends in molecular medicine.* 20(4):224-233.

Huttunen R, Syrjänen J. 2013. Obesity and the risk and outcome of infection. *Int J Obes* (Lond). Mar;37(3):333-40.

Hwang SY, Shin TG, Jo IJ, Jeon K, Suh GY, Lee TR, *et al.* 2017. Neutrophil-tolymphocyte ratio as a prognostic marker in critically-ill septic patients. *Am J Emerg Med.* ;35(2):234-9.

Jelkmann W. 1998. Proinflammatory cytokines lowering erythropoietin production. *J Interferon Cytokine Res.* 18(8):555–559.doi:10.1089/jir.1998.18.555

Jiang, H., Li, H., Li, A., Tang, E., Xu, D., Chen, Y., *et al.* 2016. Preoperative combined hemoglobin, albumin, lymphocyte and platelet levels predict survival in patients with locally advanced colorectal cancer. *Oncotarget.* 7:44.

Jiang, Y., Jiang, F., Kong, F., An, M., Jin, B., Cao, D., *et al.* 2019. Inflammatory anemia-associated parameters are related to 28-day mortality in patients with sepsis admitted to the ICU: a preliminary observational study. *Ann. Intensive Care.* 9:67.

Jung, S.M, Kim, Y.J, Ryoo, S.M, & Kim, Y.W. 2019. Relationship between low hemoglobin levels and mortality in patients with septic shock. *Acute and Critical Care.* May 34(2):141-147.

Kementerian Kesehatan Republik Indonesia. 2017. *Keputusan Menteri Kesehatan Republik Indonesia* nomor HK.01.07/menkes/342/2017 tentang pedoman nasional pelayanan kedokteran tata laksana sepsis.

Kalil, A. 2020. Septic Shock Treatment & Management. Diakses 28 Januari 2021 dari https://emedicine.medscape.com/article/168402-treatment

Kim, H.I., & Park, S. 2019. Sepsis: early recognition and optimized treatment. *Tuberc Respir Dis (Seoul).* 82(1):6-14

Kim, M.J., Park, P.W., Seo, Y.H., Kim, K.H., Seo, J.Y., Jeong, J.H., *et al.* 2013. Reference Interval for Platelet Parameter in Korean Adults Using ADVIA 2120. *Ann Lab Med*; 33: 364-366.

Kocaoğlu, S., Alatli, T.,. 2022. The efficiency of HALP score, neutrophil-lymphocyte ratio, and platelet-lymphocyte ratio in predicting mortality in intensive care patients. *Journal of Health Sciences and Medicine.* 5. 201-206.

Kono SA, Heasley LE, Doebele RC, Camidge DR. Adding to the mix: Fibroblast growth factor and platelet-derived growth factor receptor pathways as targets in non-small cell lung cancer. *Curr Cancer Drug Targets* 2012; 12(2):107-23.

Kral, J.B., Schrottmaier, W.C., Salzmann, M., & Assinger, A. 2016. Platelet interaction with innate immune cells. *Transfus Med Hemother.* 43:78–88.

Kurniawan, J., Asdie, R.H., Subronto, Y.W. 2020. Persistent lymphopenia as a predictor of in hospitality in septic patients at Dr. Sardjito hospital. Acta *Interna The Journal of Internal Medicine.* 10(1):37-49.

Lanziotti VS, Póvoa P, Soares M, Silva JR, Barbosa AP, Salluh JI. 2016. Use of biomarkers in pediatric sepsis: literature review. *Rev Bras Ter Intensiva*. 28(4):472-82.

Levy, M., Hofstra, J.J., Opal, S. 2007. Thrombocytopenia in Intensive Care Patients on Intensive Care Medicine. *Yearbook of Intensive Care and Emergency Medicine*. Vol: 2007; pp 823-833.

Lee, S., Kang, J., Jo, Y. 2015. Underweight is associated with mortality in patients with severe sepsis and septic shock. *ICMx 3,* A876

Liu, Xian, Yong Shen, Hairong Wang, Qinmin Ge, Aihua Fei, Shuming Pan, 2016. "Prognostic Significance of Neutrophil-to-Lymphocyte Ratio in Patients with Sepsis: A Prospective Observational Study", Mediators of Inflammation, Article ID 8191254, 8 pages

Loonen AJ, de Jager CP, Tosserams J, Kusters R, Hilbink M, Wever PC *et al.*,2014.Biomarkers and molecular analysis to improve bloodstream infection diagnostics in an emergency care unit. *PLoS One* 9:e87315.

Ljungstrom L, Pernestig A-K, Jacobsson G, Andersson R, Usener B, Tilevik D 2017. Diagnostic accuracy of procalcitonin, neutrophil-lymphocyte count ratio, C-reactive protein, and lactate in patients with suspected bacterial sepsis. *PLoS ONE* 12(7):e0181704.

Luan YY, Dong N, Xie M, Xiao XZ, Yao YM. 2014. The significance and regulatory mechanisms of innate immune cells in the development of sepsis. *J Interferon Cytokine Res.* 34(1):2–15.

Ma M, Yu N, Wu B. 2019. High systemic immune-inflammation index represents an unfavorable prognosis of malignant pleural mesothelioma. Cancer Manag Res. 11:3973-3979.

Matthaios Papadimitriou-Olivgeris, Diamanto Aretha, Anastasia Zotou, Kyriaki Koutsileou, Aikaterini Zbouki, Aikaterini Lefkaditi, *et al.*, 2016. "The Role of Obesity in Sepsis Outcome among Critically Ill Patients: A Retrospective Cohort Analysis", *BioMed Research International,* Article ID 5941279, 9 pages, 2016.

Marco, C.M., Casado, M.S., Martina, V.A.H., Diaz, M.Q., Villiar, S.R., Pedrero, M.J., *et al.*, 2012. Severe thrombocytopenia on admission to the intensive care unit in patients with multiple organ failure, 2012. *Med dintensiva*, Elsevier, Madrid, Volume: 55,Issue:8,pp:476-526.

Martin, G., Brunkhorst, F.M., Janes, J.M. 2009. The international PROGRESS registry of patients with severe sepsis: drotrecogin alfa (activated) use and patient outcomes. *Crit Care.* 13:R103

Martin GS, Mannino DM, Moss M. 2006. The effect of age on the development a nd outcome of adult sepsis. Crit Care Med 34: 15-21

Nasir, N., Jamil, B., Siddiqui, S., Talat, N., Khan, F.A., Hussain, R. 2015. Mortality in sepsis and its relationship with gender. P*ak J Med Sci.* 31(5):1 201-1206.

Ni J, Wang H, Li Y, Shu Y, Liu Y. 2019. Neutrophil to lymphocyte ratio (NLR) as a prognostic marker for in-hospital mortality of patients with sepsis: A secondary analysis based on a single-center, retrospective, cohort study. *Medicine (Baltimore).* 2019;98(46):e18029.

Mertoglu C, Gunay M. Neutrophil-Lymphocyte ratio and PlateletLymphocyte ratio as useful predictive markers of prediabetes and diabetes mellitus. *Diabetes Metab Syndr* 2017;11:S127–S131.

Muady, G.F, Bitterman, H., Laor, A., Vardi, M., Urin, V., & Ghanem-Zoubi, H.. 2016. Hemoglobin levels and blood transfusion in patients with sepsis in Internal Medicine Departments. *BMC Infectious Diseases*. 16:569.

Naess A, Nilssen SS, Mo R, Eide GE, Sjursen H. 2017. Role of neutrophil to lymphocyte and monocyte to lymphocyte ratios in the diagnosis of bacterial infection in patients with fever. *Infection.* 45(3):299-307.

Prashanth H V, Saldanha RMD, Shenoy S, Baliga S. 2011. Predictors of mortality in adult sepsis. *Int J Biol Med Res.* 2(4):856-61

Peng, D., Zhang, C., Gong, Y., Haol, H., Guan, B., Li1, X*., et al*. 2018. Prognostic significance of HALP (hemoglobin, albumin, lymphocyte and platelet) in patients with bladder cancer after radical cystectomy. *Scientific reports.* 8:794.

Polat, G., Ugan, R.A., Cardici, E., Halici, Z., 2017. Sepsis and septic shock: current treatment strategies and new approaches. *The Eurasian Journal of Medicine*. 49:53-8

Pradipta IS, Sodik DC, Lestari K, Parwati I, Halimah E, Diantini A, *et al.,*. 2013 Antibiotic resistance in sepsis patients: evaluation and recommendation of antibiotic use. *N Am J Med Sci*. 5(6):344-52.

Provan, D., Singer, C.R.J., Baglin, T., Lilleyman, J., 2004. *Reduced White Blood Count* in Oxford Handbook of Clinical Haematology (2nd ed), pp 16-19. *Oxford University Press,* Oxford.

Rannikko, J., Syrjänen, J., Seiskari, T., Aittoniemi, J., Huttunen, R. 2017. Sepsisrelated mortality in 497 cases with blood culture-positive sepsis in an emergency department. I*nternational Journal of Infectious Diseases.* 58:52–57

Riché F, Gayat E, Barthélémy R, Le Dorze M, Matéo J, Payen D. 2015. Reversal of neutrophil-to-lymphocyte count ratio in early versus late death from septic shock. *Crit Care.* 19:439.

Reinhart, K., Bloos, F., Brunkhorst, F.M., 2005. Pathophysiology of sepsis and multiple organ dysfunction. In *Textbook of Critical Care.* Fifth Edition. pp1249-58. Elsevier Saunders. Philadelphia.

Rhodes A, Evans LA, Alhazzani W, Levy MM, Antonelli M, *et al*. 2016. Surviving sepsis campaign: International guidelines for management of sepsis and septic shock 2016, *Intensive Care Medicine*, 2016; 43: 304–377.

Roger, P.M., Hyvernat, H., Breittmayer, J.P., Dunais, B., Dellamonica, J., Bernardin, G., *et al.* 2009. Enhanced T-cell apoptosis in human septic shock is associated with alteration of the costimulatory pathway. *Eur. J. Clin. Microbiol. Infect. Dis.* 28:575–84.

Rudd KE, Johnson SC, Agesa KM, Shackelford KA, Tsoi D, Kievlan DR, *et al.*, 2020. Global, regional, and national sepsis incidence and mortality, 1990-2017:analysis for the Global Burden of Disease Study. *Lancet.* 395(10219):200-211.

Stearns-Kurosawa DJ, Osuchowski MF, Valentine C, Kurosawa S, Remick DG. 2011. The pathogenesis of sepsis. *Annu Rev Pathol.* 6:19-48.

Salciccioli JD, Marshall DC, Pimentel MA, Santos MD, Pollard T, Celi LA, *et al.,* 2015. The association between the neutrophil-to-lymphocyte ratio and mortality in critical illness: an observational cohort study. Crit Care. 2015 Jan 19;19(1):13

Saracco P, Vitale P, Scolfaro C, Pollio B, Pagliarino M, Timeus F. 2011. The coagulopathy in sepsis: Significance and implications for treatment, *Pediatric Reports,* 3(4):119-121.

Seager RJ, Hajal C, Spill F, Kamm RD, Zaman MH. Dynamic interplay between tumour, stroma and immune system can drive or prevent tumour progression. *Converg Sci Phys Oncol* 2017;3(3):034002.

Shen XF, Cao K, Jiang JP, Guan WX, Du JF. 2017. Neutrophil dysregulation during sepsis: an overview and update. *J Cell Mol Med.* 21(9):1687–1697.

Shen Y, Huang X, Zhang W 2018. Platelet-to-lymphocyte ratio as a prognostic predictor of mortality for sepsis: interaction effect with disease severity—a retrospective study *BMJ Open* 2019;9:e022896. doi: 10.1136/bmjopen-2018-022896

Shen, X.B., Zhang, Y.X., Wang, W., & Pan, Y.Y. 2019. The hemoglobin, albumin, lymphocyte, and platelet (HALP) score in patients with small cell lung cancer before first-line treatment with etoposide and progression- free survival. *Med Sci Monit.* 25:5630-5639.

ShiHui Lin; Fan Jing; Liao Xiao Hui; Ning Yi Wan; Yang Yuan Zheng; Zhang Mu, 2019. Clinical value of systemic immune-inammation index in assessing the severity and prognosis of sepsis. *Journal of Chongqing Medical University*, Vol. 44 , No. 5 , pp. 622-626

Singer, M., Deutschman, C.S., Seymour, C.W., Shankar-Hari, M., Annane, D., Bauer, M., *et al.* 2016, The third international consensus definitions for sepsis and septic shock (Sepsis-3). *J Am Med Assoc.* 315:801–810.

Singer, Mervyn 2016. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). *J Am Med Assoc* 315(8):801-10.

Song JE, Kim MH, Jeong WY, Jung IY, Oh DH, Kim YC, *et al.*, 2016. Mortality risk factors for patients with septic shock after implementation of the surviving sepsis campaign bundles. *Infect Chemother* 48:199-208.

Sugondo. 2009. Buku Ajar Penyakit Dalam. Jakarta: *EGC.*

Sun Y, Li W, Li AJ, Su H, Yue J, Yu J. 2019. Increased systemic immune-inflammation index independently predicts poor survival for hormone receptor-negative, HER2-positive breast cancer patients. Cancer Manag Res. 11:3153-3162.

Takegawa. R., Kabata, D., Shimizu, K., Hisanob, S., Ogura, H., Shintani, A.*, et al.*, 2019. Serum albumin as a risk factor for death in patients with prolonged sepsis: an observational study. *Journal of Critical Care.* 51:139–144

Teggert, Andrew, Harish Datta, and Zulfiqur Ali. 2020. "Biomarkers for Point-of-Care Diagnosis of Sepsis" *Micromachines* 11, no. 3: 286.

Thiery-Antier, N., Binquet, C., Vinault, S., Meziani, F., Boisramé-Helms, J., Quenot, J.P., *et al.* 2016. Is thrombocytopenia an early prognostic marker in septic shock. *Crit Care Med*. 44(4):764-72.

Tian M, Li Y, Wang X, 2021. The hemoglobin, albumin, lymphocyte, and platelet (HALP) score is associated with poor outcome of acute ischemic stroke. *Front Neurol* 11: 610318.

Vahedi S M H, Bagheri A, Jahanshir A, Seyedhosseini J, Vahidi E. 2019. Association of Lymphopenia with Short Term Outcomes of Sepsis Patients; a Brief Report. *Arch Acad Emerg Med*. 7(1):e14. Published 2019 Jan 20.

Venet, F., Davin, F., Guignant, C., Larue, A., Cazalis, M.A., Darbon, R., *et al*. 2010. Early assessment of leukocyte alterations at diagnosis of septic shock. *Shock.* 34:358–363.

Viasus, D., Garcia-Vidal, C., Simonetti, A., Manresa, F., Dorca, J., Gudiol, F., *et al*. 2013. Prognostic value of serum albumin levels in hospitalized adults with community-acquired pneumonia. *Journal of Infection*. 66:415-423.

Viljoen M, Coetzee IH, Roux LJ, 1994. Anemia in surgical intensive care patients. Haematologica. 79(1):19–24.

Vincent JL, Baron JF, Reinhart K, 2002. Anemia and blood transfusion in critically ill patients. *JAMA*. 2002;288(12):1499–1507.

Vieira-de-Abreu, A., Campbell, R.A., Weyrich, A.S., & Zimmerman, G.A. 2012 Platelets: versatile effector cells in hemostasis, inflammation, and the immune continuum. *Semin Immunopathol.* 34(1):5-30.

Vincent, J.L., Moreno, R., Takala, J., Willatts, S., De Mendonça, A., Bruining, H., *et al.* 1996. The SOFA (Sepsis-related Organ Failure Assessment) score to describe organ dysfunction/failure. On behalf of the Working Group on Sepsis-Related Problems of the European Society of Intensive Care Medicine. *Intensive Care Med.* 22(7):707-10.

Xuan Liu, Yong Shen, Hairong Wang, Qinmin Ge, Aihua Fei, Shuming Pan, 2016. "Prognostic Significance of Neutrophil-to-Lymphocyte Ratio in Patients with Sepsis: A Prospective Observational Study", *Mediators of Inflammation*, Article ID 8191254, 8 pages

Wang, H.E, Shapiro, N.I., Griffin, R., Safford, M.M., Judd, S., Howard, G. 2012. Chronic medical conditions and risk of sepsis. *PLoS ONE*. 7(10):e48307.

Wu L, Zou S, Wang C, Tan X, Yu M. 2019. Neutrophil-to-lymphocyte and platelet-to-lymphocyte ratio in Chinese Han population from Chaoshan region in South China. BMC *Cardiovasc Disord.* 19(1):125. Published 2019 May 27. doi:10.1186/s12872-019-1110-7

Xu SS, Li S, Xu HX, 2020. Haemoglobin, albumin, lymphocyte and platelet predicts postoperative survival in pancreatic cancer. World J Gastroenterol 2020; 26: 828-38.

Yin, M., Si, L., Qin, W., Li, C., Zhang, J., Yang, H., *et al*. 2018. Predictive value of serum albumin level for the prognosis of severe sepsis without exogenous human albumin administration: a prospective cohort study. *Journal of Intensive Care Medicine*. 33(12):687-694.

Zahorec R: 2001. Ratio of neutrophil to lymphocyte counts-rapid and simple parameter of systemic inflammation and stress in critically ill. *Bratisl Lek Listy* 102: 5-14,

Zhang HB, Chen J, Lan QF, Ma XJ, Zhang SY. 2016. Diagnostic values of red cell distribution width, platelet distribution width and neutrophil lymphocyte count ratio for sepsis. *Exp Ther Med. 12(4):2215-9.*

Zhao, H., Heard, S.O., Mullen, M.T., Crawford, S., Goldberg, R.J., Frendl, G., *et al.,* 2012. An evaluation of the diagnostic accuracy of the 1991 American College of Chest Physicians/Society of Critical Care Medicine and the 2001 Society of Critical Care Medicine/European Society of Intensive Care Medicine/American College of Chest Physicians/American Thoracic Society/Surgical Infection Society sepsis definition. *Crit Care Med*. 40(6):1700–1706.

Zhou, Q., Wang, M., Li, S., Jing Zhang, J., Ma, Q., Ding, Y., *et al*. 2018. Impact of body mass index on survival of medical patients with sepsis: a prospective cohort study in a university hospital in China. *BMJ Open*. 8:e021979.

Zonneveld R, Molema G, Plotz FB. 2016. Analyzing Neutrophil Morphology, Mechanics, and Motility in Sepsis: Options and Challenges for Novel Bedside Technologies. Crit Care Med. 44(1):218–28.

LAMPIRAN

Lampiran 1. Ethical Committee Approval

MEDICAL AND HEALTH RESEARCH ETHICS COMMITTEE (MHREC)
FACULTY OF MEDICINE, PUBLIC HEALTH AND NURSING
UNIVERSITAS GADJAH MADA – DR. SARDJITO GENERAL HOSPITAL

ETHICS COMMITTEE APPROVAL

Ref. No. : KE/FK/1208/EC/2021

Title of the Research Protocol	:	Perbandingan Nilai Prognostik Rasio Netrofil Limfosit, Skor Halp, dan Indeks SII Terhadap Kematian Akibat Sepsis
Document(s) Approved and version	:	Study Protocol version 02 2021
Principle Investigator	:	Heppy Oktavianto
Participating Investigator(s)	:	1. dr. Rizka Humardewayanti, Sp.PD-KPTI. 2. dr. Doni Priambodo, Sp.PD-KPTI.
Date of Approval	:	0 8 NOV 2021 (Valid for one year beginning from the date of approval)
Institution(s)/place(s) of research	:	Instalasi Catatan Medik RSUP Dr. Sardjito Yogyakarta

The Medical and Health Research Ethics Committee (MHREC) states that the document above meets the ethical principle outlined in the International and National Guidelines on ethical standards and procedures for researches with human beings.

The Medical and Health Research Ethics Committee (MHREC) has the right to monitor the research activities at any time.

The investigator(s) is/are obliged to submit:
☑ Progress report as a continuing review (state its due time)
☑ Report of any serious adverse events (SAE)
☑ Final report upon the completion of the study

Dr. dr. Eti Nurwening S., M.Kes., M.Med.Ed.
Panel's vice chairperson

dr. Agus Surono, M.Sc., Ph.D., Sp.THT-KL.(K).
Panel's secretary

P.S: This letter uses signature scan of the panel's chairperson and Secretary of the Ethics Committee. The hardcopy official letter with authority's signature will be issued when it is possible and are kept as an archive of the Ethics Committee

Validation number : 6188bb5f72670 (http://komisietk.fk.ugm.ac.id/validasi)

Recognized by Forum for Ethical Review Committees in Asia and the Western Pacific (FERCAP)
5-Nov-21