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Sepsis

Current Awareness Bulletin

February 2025

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  30 minutes. Learn about the communication barriers patients may encounter, and ways to ensure they get the most from their care.
  Next sessions: 4th March @ 12 noon, 2nd April @ 1pm & 15th May @ 2pm

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1. **Effect of Automated Real-Time Feedback on Early-Sepsis Care: A Pragmatic Clinical Trial.**

Authors: Leisman, Daniel E.;Deng, Hao;Lee, Andy H.;Flynn, Micah H.;Rutkey, Hayley;Copenhaver, Martin S.;Gay, Elizabeth A.;Dutta, Sayon;McEvoy, Dustin S.;Dunham, Lisette N.;Mort, Elizabeth A.;Lucier, David J.;Sonis, Jonathan D.;Aaronson, Emily L.;Hibbert, Kathryn A. and Safavi, Kyan C.

Publication Date: Feb 01 ,2024

Journal: Critical Care Medicine 52(2), pp. 210–222

Abstract: OBJECTIVES: To determine if a real-time monitoring system with automated clinician alerts improves 3-hour sepsis bundle adherence. DESIGN: Prospective, pragmatic clinical trial. Allocation alternated every 7 days. SETTING: Quaternary hospital from December 1, 2020 to November 30, 2021. PATIENTS: Adult emergency department or inpatients meeting objective sepsis criteria triggered an electronic medical record (EMR)-embedded best practice advisory. Enrollment occurred when clinicians acknowledged the advisory indicating they felt sepsis was likely. INTERVENTION: Real-time automated EMR monitoring identified suspected sepsis patients with incomplete bundle measures within 1-hour of completion deadlines and generated reminder pages. Clinicians responsible for intervention group patients received reminder pages; no pages were sent for controls. The primary analysis cohort was the subset of enrolled patients at risk of bundle nonadherent care that had reminder pages generated. MEASUREMENTS AND MAIN RESULTS: The primary outcome was orders for all 3-hour bundle elements within guideline time limits. Secondary outcomes included guideline-adherent delivery of all 3-hour bundle elements, 28-day mortality, antibiotic discontinuation within 48-hours, and pathogen recovery from any culture within 7 days of time-zero. Among 3,269 enrolled patients, 1,377 had reminder pages generated and were included in the primary analysis. There were 670 (48.7%) at-risk patients randomized to paging alerts and 707 (51.3%) to control. Bundle-adherent orders were placed for 198 intervention patients (29.6%) versus 149 (21.1%) controls (difference: 8.5%; 95% CI, 3.9-13.1%; p = 0.0003). Bundle-adherent care was delivered for 152 (22.7%) intervention versus 121 (17.1%) control patients (difference: 5.6%; 95% CI, 1.4-9.8%; p = 0.0095). Mortality was similar between groups (8.4% vs 8.3%), as were early antibiotic discontinuation (35.1% vs 33.4%) and pan-culture negativity (69.0% vs 68.2%). CONCLUSIONS: Real-time monitoring and paging alerts significantly increased orders for and delivery of guideline-adherent care for suspected sepsis patients at risk of 3-hour bundle nonadherence. The trial was underpowered to determine whether adherence affected mortality. Despite enrolling patients with clinically suspected sepsis, early antibiotic discontinuation and pan-culture negativity were common, highlighting challenges in identifying appropriate patients for sepsis bundle application.

2. **Hydrocortisone-associated death and hospital length of stay in patients with sepsis: A retrospective cohort of large-scale clinical care data.**

Authors: Li, Mohan;Noordam, Raymond;Winter, Elizabeth M.;van Meurs, Matijs;Bouma, Hjalmar R.;Arbous, M. Sesmu;Rensen, Patrick C. N. and Kooijman, Sander

Publication Date: Jan ,2024

Journal: Biomedicine & Pharmacotherapy 170, pp. 115961

Abstract: PURPOSE: Sepsis is one of the leading causes of morbidity and mortality worldwide with approximately 50 million annual cases. There is ongoing debate on the clinical benefit of hydrocortisone in the prevention of death in septic patients. Here we evaluated the association between hydrocortisone treatment and mortality in patients diagnosed with sepsis in a large-scale clinical dataset. METHODS: Data from patients between 2008 and 2019 were extracted from the retrospective Medical Information Mart for Intensive Care IV (MIMIC-IV) database. Patients who received hydrocortisone after diagnosis were matched using propensity-score matching with patients who did not, to balance confounding (by indication and contraindication) factors between the groups. 90-day mortality and survivors' length of hospital stay was compared between patients who did or did not receive hydrocortisone. RESULTS: A total of 31,749 septic patients were included in the study (mean age: 67, men: 57.3%, in-hospital mortality: 15.6%). 90-day mortality was higher among the 1802 patients receiving hydrocortisone when compared with the 6348 matched non-users (hazard ratio: 1.35, 95% CI: 1.24-1.47). Hydrocortisone treatment was also associated with increased in-hospital mortality (40.9% vs. 27.6%, p

3. **The clinical trajectory of peripheral blood immune cell subsets, T-cell activation, and cytokines in septic patients.**

Authors: Lu, Xuan;Song, Cong-Ying;Wang, Ping;Li, Li;Lin, Li-Ying;Jiang, Shuai;Zhou, Jia-Ning;Feng, Meng-Xiao;Yang, Yun-Mei and Lu, Yuan-Qiang

Publication Date: Jan ,2024

Journal: Inflammation Research 73(1), pp. 145–155

Abstract: OBJECTIVE AND DESIGN: Changes in the immune status of patients with sepsis may have a major impact on their prognosis. Our research focused on changes in various immune cell subsets and T-cell activation during the progression of sepsis. METHODS AND SUBJECTS: We collected data from 188 sepsis patients at the First Affiliated Hospital of Zhejiang University School of Medicine. The main focus was on the patient's immunocyte subset typing, T-cell activation/Treg cell analysis, and cytokine assay, which can indicate the immune status of the patient. RESULTS: The study found that the number of CD4+ T cells, CD8+ T cells, NK cells, and B cells decreased early in the disease, and the decrease in CD4+ and CD8+ T cells was more pronounced in the death group. T lymphocyte activation was inhibited, and the number of Treg cells increased as the disease progressed. T lymphocyte inhibition was more significant in the death group, and the increase in IL-10 was more significant in the death group. Finally, we used patients' baseline conditions and immunological detection indicators for modeling and found that IL-10, CD4+ Treg cells, CD3+HLA-DR+ T cells, and CD3+CD69+ T cells could predict patients' prognosis well. CONCLUSION: Our study found that immunosuppression occurs in patients early in sepsis. Early monitoring of the patient's immune status may provide a timely warning of the disease.

4. **Can biomarkers help identify sepsis in adults?.**

Authors: Narasimhan, Katherine and D'Acunto, Kristin

Publication Date: Jan 01 ,2024

Journal: JAAPA 37(1), pp. 17–21

Abstract: ABSTRACT: Sepsis is increasing in incidence in the United States and is one of the most common causes of death in hospitalized patients. Sepsis affects different biochemical and immunologic pathways and can present variably. Despite efforts to unify definitions of sepsis, increase awareness, and improve treatment, mortality remains high. Because of sepsis's complex pathophysiology, diagnosis can be challenging. No diagnostic test is sensitive or specific enough to diagnose sepsis in isolation. However, three biomarkers-lactate, C-reactive protein, and procalcitonin-in combination with other diagnostics may help clinicians diagnose sepsis earlier, leading to better patient outcomes.

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5. **Pediatric Sepsis Diagnosis, Management, and Sub-phenotypes.**

Authors: Weiss, Scott L. and Fitzgerald, Julie C.

Publication Date: Jan 01 ,2024

Journal: Pediatrics 153(1)

Abstract: Sepsis and septic shock are major causes of morbidity, mortality, and health care costs for children worldwide, including >3 million deaths annually and, among survivors, risk for new or worsening functional impairments, including reduced quality of life, new respiratory, nutritional, or technological assistance, and recurrent severe infections. Advances in understanding sepsis pathophysiology highlight a need to update the definition and diagnostic criteria for pediatric sepsis and septic shock, whereas new data support an increasing role for automated screening algorithms and biomarker combinations to assist earlier recognition. Once sepsis or septic shock is suspected, attention to prompt initiation of broad-spectrum empiric antimicrobial therapy, fluid resuscitation, and vasoactive medications remain key components to initial management with several new and ongoing studies offering new insights into how to optimize this approach. Ultimately, a key goal is for screening to encompass as many children as possible at risk for sepsis and trigger early treatment without increasing unnecessary broad-spectrum antibiotics and preventable hospitalizations. Although the role for adjunctive treatment with corticosteroids and other metabolic therapies remains incompletely defined, ongoing studies will soon offer updated guidance for optimal use. Finally, we are increasingly moving toward an era in which precision therapeutics will bring novel strategies to improve outcomes, especially for the subset of children with sepsis-induced multiple organ dysfunction syndrome and sepsis subphenotypes for whom antibiotics, fluid, vasoactive medications, and supportive care remain insufficient.

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6. **Identification of discriminatory factors and construction of nomograms for differentiating AOSD and sepsis.**

Authors: Yin, Songlou;Luo, Fei;Xie, Jingzhi;Zeng, Yanzhen;Fang, Quanquan;Zong, Juan;Cao, Lina;Yin, Hanqiu;Duan, Lili and Zhou, Dongmei

Publication Date: Jan ,2024

Journal: Clinical Rheumatology 43(1), pp. 569–578

Abstract: OBJECTIVE: This study aimed to develop nomogram prediction models to differentiate between adult-onset Still's disease (AOSD) and sepsis. METHODS: We retrospectively collected laboratory test data from 107 hospitalized patients with AOSD and sepsis at the Affiliated Hospital of Xuzhou Medical University. Multivariate binary logistic regression was used to develop nomogram models using arthralgia, WBC, APTT, creatinine, PLT, and ferritin as independent factors. The performance of the model was evaluated by the bootstrap consistency index and calibration curve.

RESULTS: Model 1 had an AUC of 0.98 (95% CI, 0.96-1.00), specificity of 0.98, and sensitivity of 0.94. Model 2 had an AUC of 0.96 (95% CI, 0.93-1.00), specificity of 0.92, and sensitivity of 0.94. The fivefold cross-validation yielded an accuracy (ACC) of 0.92 and a kappa coefficient of 0.83 for Model 1, while for Model 2, the ACC was 0.87 and the kappa coefficient was 0.74. CONCLUSION: The nomogram models developed in this study are useful tools for differentiating between AOSD and sepsis. Key Points * The differential diagnosis between AOSD and sepsis has always been a challenge * Delayed treatment of AOSD may lead to serious complications * We developed two nomogram models to distinguish AOSD from sepsis, which were not previously reported * Our models can be used to guide clinical practice with good discrimination.

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7. **Predicting Hospital Readmission among Patients with Sepsis Using Clinical and Wearable Data.**

Authors: Amrollahi, Fatemeh;Shashikumar, Supreeth Prajwal;Boussina, Aaron;Yhdego, Haben;Nayebnazar, Arshia;Yung, Nathan;Wardi, Gabriel and Nemati, Shamim

Publication Date: 2023

Journal: Annual International Conference of the IEEE Engineering in Medicine and Biology Society 2023, pp. 1–4

Abstract: Sepsis is a life-threatening condition that occurs due to a dysregulated host response to infection. Recent data demonstrate that patients with sepsis have a significantly higher readmission risk than other common conditions, such as heart failure, pneumonia and myocardial infarction and associated economic burden. Prior studies have demonstrated an association between a patient's physical activity levels and readmission risk. In this study, we show that distribution of activity level prior and post-discharge among patients with sepsis are predictive of unplanned rehospitalization in 90 days (P-value<1e-3). Our preliminary results indicate that integrating Fitbit data with clinical measurements may improve model performance on predicting 90 days readmission.Clinical relevance Sepsis, Activity level, Hospital readmission, Wearable data.

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8. **Performance Characteristics of Sepsis Screening Tools During Antepartum and Postpartum Admissions.**

Authors: Bauer, M. E.;Fuller, M.;Kovacheva, V.;Elkhateb, R.;Azar, K.;Caldwell, M.;Chiem, V.;Foster, M.;Gibbs, R.;Hughes, B. L.;Johnson, R.;Kottukapally, N.;Rosenstein, M. G.;Cortes, M. S.;Shields, L. E.;Sudat, S.;Sutton, C. D.;Toledo, P.;Traylor, A.;Wharton, K., et al

Publication Date: 2023

Journal: Obstetrics and Gynecology (pagination), pp. ate of Pubaton: 12 e 2023

Abstract: OBJECTIVE: To evaluate the performance characteristics of existing screening tools for the prediction of sepsis during antepartum and postpartum readmissions. METHOD(S): This was a case-control study using electronic health record data obtained between 2016 and 2021 from 67 hospitals for antepartum sepsis admissions and 71 hospitals for postpartum readmissions up to 42 days. Patients in the sepsis case group were matched in a 1:4 ratio to a comparison cohort of patients without sepsis admitted antepartum or postpartum. The following screening criteria were evaluated: the CMQCC (California Maternal Quality Care Collaborative) initial sepsis screen, the non-pregnancy-adjusted SIRS (Systemic Inflammatory Response Syndrome), the MEWC (Maternal Early Warning Criteria), UKOSS (United Kingdom Obstetric Surveillance System) obstetric SIRS, and the MEWT (Maternal Early Warning Trigger Tool). Time periods were divided into early pregnancy (less than 20 weeks of gestation), more than 20 weeks of gestation, early postpartum (less than 3 days postpartum), and late postpartum through 42 days. False-positive screening rates, C-statistics, sensitivity, and specificity were reported for each overall screening tool and each individual criterion. RESULT(S): We identified 525 patients with sepsis during an antepartum hospitalization and 728 patients with sepsis during a

postpartum readmission. For early pregnancy and more than 3 days postpartum, non-pregnancy-adjusted SIRS had the highest C-statistics (0.78 and 0.83, respectively). For more than 20 weeks of gestation and less than 3 days postpartum, the pregnancy-adjusted sepsis screening tools (CMQCC and UKOSS) had the highest C-statistics (0.87-0.94). The MEWC maintained the highest sensitivity rates during all time periods (81.9-94.4%) but also had the highest false-positive rates (30.4-63.9%). The pregnancy-adjusted sepsis screening tools (CMQCC, UKOSS) had the lowest false-positive rates in all time periods (3.9-10.1%). All tools had the lowest C-statistics in the periods of less than 20 weeks of gestation and more than 3 days postpartum. CONCLUSION(S): For admissions early in pregnancy and more than 3 days postpartum, non-pregnancy-adjusted sepsis screening tools performed better than pregnancy-adjusted tools. From 20 weeks of gestation through up to 3 days postpartum, using a pregnancy-adjusted sepsis screening tool increased sensitivity and minimized false-positive rates. The overall false-positive rate remained high.

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9. **Usefulness of the Quick-Sepsis Organ Failure Assessment Score in Cardiovascular Intensive Care Unit to Predict Prognosis in Acute Coronary Syndrome.**

Authors: Bouchlarhem, Amine;Bazid, Zakaria;Ismaili, Nabila and Noha, El Ouafi

Publication Date: 2023

Journal: Clinical & Applied Thrombosis/Hemostasis 29, pp. 10760296231218705

Abstract: Triage of patients with acute coronary syndrome (ACS) at high risk of in-hospital complications is essential. In this study, we evaluated the quick sepsis organ failure assessment (qSOFA) score as a tool for predicting the prognosis of 964 patients admitted to the cardiovascular intensive care unit (CICU) with ACS over a 4-year period. In total, out of 964 patients included, with a percentage of 4.6% for 30-day mortality. The risk of 30-day mortality was independently associated with qSOFA >= 2 at admission (hazard ratio = 2.76, 95% CI 1.32-5.74, p = 0.007). For MACEs, qSOFA >= 2 at admission was a predictive factor with (odds ratio = 2.42, 95% CI 1.37-4.36, p = .002). A qSOFA >= 2 on admission had an AUC of 0.729 (95% CI [0.694, 0.762]), with a good specificity of 91.6%. For 30-day mortality, an AUC of 0.759 (95%CI [0.726, 0.792]) for cardiogenic shock with specificity of 92.5%. For MACEs, an AUC of 0.702 (95% CI [0.64, 0.700] with a specificity of 95%. Concerning the different scores tested, we found no significant difference between the Zwolle score and the qSOFA score for predicting prognosis, whereas the CADILLAC score was better than qSOFA for predicting 30-day mortality (AUC = 0.829 and De long test = 0.03). However, there was no difference between qSOFA and CADILLAC scores for predicting cardiogenic shock (De Long test at 0.08). This is the first study to evaluate qSOFA as a predictive score for 30-day mortality and MACEs, and the results are very encouraging, particularly for cardiogenic shock.

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10. **Altered Ex Vivo NLRP3 Inflammasome Activation Is Associated with 28-Day Mortality in Septic Patients.**

Authors: Coudereau, Remy;Monneret, Guillaume;Lukaszewicz, Anne-Claire;Py, Benedicte F.;Argaud, Laurent;Cour, Martin;Bidar, Frank;Gossez, Morgane and Venet, Fabienne

Publication Date: Dec 13 ,2023

Journal: Viruses 15(12)

Abstract: Sepsis is a life-threatening organ dysfunction caused by a dysregulated response to infection. In this context, the aberrant activation of the NLRP3 inflammasome has been documented mostly through the measurement of increased plasmatic concentrations of IL-1beta and IL-18. At the cellular level, contradictory results have been published. However, no study has comprehensively monitored NLRP3 inflammasome activation at the basal level and after ex vivo reactivation of whole blood monocytes and neutrophils focusing on ICU patients with bacterial and viral sepsis, including a longitudinal analysis. Thus, we conducted a prospective longitudinal study, examining NLRP3

inflammasome functionality in COVID-19 ICU patients (n = 15) and bacterial septic shock patients (n = 17) during the first week of ICU hospitalization, compared with healthy donors. Using two whole-blood flow cytometry assays, we detected ASC speck-positive monocytes (i.e., monocytes presenting the polymerization of ASC proteins) and activated caspase-1 in polymorphonuclear cells as read-outs, both at baseline and following nigericin stimulation, a drug that forms pores and activates the NLRP3 inflammasome. Our findings showed that, at baseline and regardless of the type of infection, patients exhibited reduced ASC speck-positive monocytes and decreased activated caspase-1 in PMN compared to healthy volunteers. This decrease was prominent at day 0. Following nigericin stimulation, this reduction was also observed and persisted throughout the first week of hospitalization, irrespective of the cellular population or parameter being considered. Notably, at day 0, this diminished activation and response to stimulation of NLRP3 was associated with a higher 28-day mortality rate. Consequently, our observations highlighted a concurrent decline in both basal expression and ex vivo activation of the NLRP3 inflammasome in circulating myeloid cells from patients with bacterial and viral sepsis in association with increased mortality.

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11. **Correlation between angiotensin and acute kidney injury in patients with sepsis.**

Authors: Du, C-B;Zhang, Y-X;Du, R.;Li, D-L;Zhao, Z-T;Lu, P.;Liu, Y. and Yang, X-F

Publication Date: Nov ,2023

Journal: European Review for Medical & Pharmacological Sciences 27(22), pp. 11109–11114

Abstract: OBJECTIVE: The aim of the study was to analyze the changes in angiotensin (Ang) levels in patients with sepsis complicated with acute kidney injury (AKI) and evaluate the relationship between Ang and AKI. PATIENTS AND METHODS: Prospective research methods were used in this study. A total of 66 sepsis patients admitted to the Intensive care Unit (ICU) of the First Hospital of Hebei Medical University from October 2020 to January 2021 were enrolled. According to the occurrence of AKI, patients were divided into the sepsis-associated AKI (SA-AKI) group and the non-AKI group. The levels of Ang-1 and Ang-2 were compared between the two groups. The relationship between Ang and glomerular filtration rate (GFR) in sepsis patients was studied by correlation analysis. RESULTS: Plasma Ang-1 in the SA-AKI group was significantly higher than that in the non-AKI group (0.39+/-1.05 ng/ml vs. 0.10+/-0.24 ng/ml, p=0.039). The Ang-2/Ang-1 in the SA-AKI group was lower than that in the non-AKI group with a significant difference (52.55+/-191.38 vs. 349.50+/-327.49, p=0.001). Correlation analysis indicated that Ang-1 was negatively correlated with GFR (r=-0.12, p=0.031), while Ang-2/Ang-1 was positively correlated with GFR (r=0.21, p<0.001). The Ang-2 was positively correlated with GFR (r=0.204, p<0.001) CONCLUSIONS: Plasma Ang-1 and Ang-2 levels are suggestive for assessing the risk of AKI in patients with sepsis.

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12. **Impact of early heparin therapy on outcomes in patients with solid malignancy associated sepsis: a marginal structural model causal analyse.**

Authors: Huang, Jia-Jia;Cai, Ji-Zhen;Zhou, Zhi-Peng;Liu, Yan;Yang, Zhen-Jia;Li, Da-Zheng;Chen, Yu-Hua;Luan, Ying-Yi;Yao, Yong-Ming and Wu, Ming

Publication Date: 2023

Journal: Frontiers in Pharmacology 14, pp. 1281235

Abstract: Background: Previous studies documented that heparin can inhibit the invasion and metastasis of tumors, but its role on outcomes in patients with solid malignancy complicated sepsis remains unclear. Methods: A retrospective cohort study was conducted in critically ill patients with solid malignancy associated sepsis from the Medical Information Mart for Intensive Care (MIMIC)-IV database. The primary endpoint was intensive care unit (ICU) mortality, secondary outcomes were thrombosis and hospital mortality. Propensity score matching (PSM), marginal structural Cox model (MSCM), cox proportional hazards model, stratification analysis and E-value were used to account for baseline differences, time-varying confounding and unmeasured variables. Results: A total of 1,512

patients with solid malignancy complicated sepsis were enrolled, of which 683 in the heparin group with intensive care unit mortality, thrombosis rate and hospital mortality were 9.7%, 5.4%, 16.1%, and 829 in the non-heparin group with ICU mortality, thrombosis rate and hospital mortality were 14.6%, 12.5%, 22.6%. Similar results were observed on outcomes for patients with PSM (ICU mortality hazard ratio [HR] 0.61, 95% confidence interval [CI] 0.41-0.92), thrombosis rate (HR 0.42, 95% confidence interval 0.26-0.68); hospital mortality HR 0.70, 95% CI 0.50-0.99). marginal structural Cox model further reinforced the efficacy of heparin in reducing ICU mortality (HR 0.48, 95% CI 0.34-0.68). Logistic regression and Cox regression model showed heparin use also markedly reduced thrombosis (HR 0.42; 95% CI 0.26-0.68; p A total of 1,512 patients with solid malignancy complicated sepsis were enrolled, of which 683 in the heparin group with intensive care unit mortality, thrombosis rate and hospital mortality were 9.7%, 5.4%, 16.1%, and 829 in the non-heparin group with ICU mortality, thrombosis rate and hospital mortality were 14.6%, 12.5%, 22.6%. Similar results were observed on outcomes for patients with PSM (ICU mortality hazard ratio [HR] 0.61, 95% confidence interval [CI] 0.41-0.92), thrombosis rate (HR 0.42, 95% confidence interval 0.26-0.68); hospital mortality HR 0.70, 95% CI 0.50-0.99). marginal structural Cox model further reinforced the efficacy of heparin in reducing ICU mortality (HR 0.48, 95% CI 0.34-0.68). Logistic regression and Cox regression model showed heparin use also markedly reduced thrombosis (HR 0.42; 95% CI 0.26-0.68; p Conclusion: Early heparin therapy improved outcomes in critically ill patients with solid malignancy complicated sepsis. These results are evident especially in those with digestive system cancer. A prospective randomized controlled study should be designed to further assess the relevant findings.

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13. **Area Deprivation Index Predicts Mortality for Critically Ill Surgical Patients With Sepsis.**

Authors: Kellett, Whitney;Jalilvand, Anahita;Collins, Courtney;Ireland, Megan;Baselice, Holly;Abboud, George and Wisler, Jon

Publication Date: Dec ,2023

Journal: Surgical Infections 24(10), pp. 879–886

Abstract: Background: The impact of socioeconomic status on outcomes after sepsis has been challenging to define, and no polysocial metric has been shown to predict mortality in sepsis. The primary objective of this study was to evaluate the association between the Area Deprivation Index (ADI) and mortality in patients admitted to the surgical intensive care unit (SICU) with sepsis. Patients and Methods: All patients admitted to the SICU with sepsis (Sequential Organ Failure Assessment [SOFA] score >=2) were retrospectively reviewed. The ADI scores were obtained and classified as "high ADI" (>=85th percentile, n = 400, representative of high socioeconomic deprivation) and "control ADI" (ADI All patients admitted to the SICU with sepsis (Sequential Organ Failure Assessment [SOFA] score >=2) were retrospectively reviewed. The ADI scores were obtained and classified as "high ADI" (>=85th percentile, n = 400, representative of high socioeconomic deprivation) and "control ADI" (ADI Results: High ADI patients were younger (mean age 58.5 vs. 60.8; p = 0.01) and more likely to be non-white (23.7% vs. 10.0%; p High ADI patients were younger (mean age 58.5 vs. 60.8; p = 0.01) and more likely to be non-white (23.7% vs. 10.0%; p Conclusions: High ADI is an independent predictor of 90-day mortality in patients with surgical sepsis. Targeted community interventions are needed to reduce sepsis mortality for these at-risk patients.

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14. **Clinical effects of bacteremia in sepsis patients with community-acquired pneumonia.**

Authors: Kim, Tae Wan;Lee, Se-Uk;Park, Boram;Jeon, Kyeongman;Park, Sunghoon;Suh, Gee Young;Oh, Dong Kyu;Lee, Soo Yeon;Park, Mi Hyeon;Lee, Haein;Lim, Chae-Man and Ko, Ryoung-Eun

Publication Date: Dec 19 ,2023

Journal: BMC Infectious Diseases 23(1), pp. 887

Abstract: BACKGROUND: Data regarding the clinical effects of bacteremia on severe community-

acquired pneumonia (CAP) are limited. Thus, we investigated clinical characteristics and outcomes of severe CAP patients with bacteremia compared with those of subjects without bacteremia. In addition, we evaluated clinical factors associated with bacteremia at the time of sepsis awareness. METHODS: We enrolled sepsis patients diagnosed with CAP at emergency departments (EDs) from an ongoing nationwide multicenter observational registry, the Korean Sepsis Alliance, between September 2019 and December 2020. For evaluation of clinical factors associated with bacteremia, we divided eligible patients into bacteremia and non-bacteremia groups, and logistic regression analysis was performed using the clinical characteristics at the time of sepsis awareness. RESULT: During the study period, 1,510 (47.9%) sepsis patients were caused by CAP, and bacteremia was identified in 212 (14.0%) patients. Septic shock occurred more frequently in the bacteremia group than in the non-bacteremia group (27.4% vs. 14.8%; p

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15. **Variability in Provider Assessment of Sepsis and Potential of Host Response Technology to Address this Dilemma-Results of an Online Delphi Study.**

Authors: Kraus, Chadd K.;O'Neal, Hollis R.;Ledeboer, Nathan A.;Rice, Todd W.;Self, Wesley H. and Rothman, Richard E.

Publication Date: Dec 05 ,2023

Journal: Journal of Personalized Medicine 13(12)

Abstract: Potentially septic patients have a huge clinical and economic impact on hospitals and often present to the emergency department (ED) with undifferentiated symptoms. The triage of these patients is complex and has historically relied heavily upon provider judgment. This study aims to evaluate the consistency of provider judgment and the potential of a new host response sepsis test to aid in the triage process. A modified Delphi study involving 26 participants from multiple specialties was conducted to evaluate provider agreement about sepsis risk and to test proposed actions based on the results of a sepsis test. The participants considered case vignettes of potentially septic patients designed to represent diagnostic dilemmas. Provider assessment of sepsis risk in these cases ranged from 10% to 90% and agreement was poor. Agreement about clinical actions to take in response to testing improved when participants considered their own hypothetical borderline cases. New host response testing for sepsis may have the potential to improve sepsis diagnosis and care and should be applied in a protocolized fashion to ensure consistency of results.

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16. **Prolonged vs intermittent intravenous infusion of beta-lactam antibiotics for patients with sepsis: a systematic review of randomized clinical trials with meta-analysis and trial sequential analysis.**

Authors: Li, Xiaoming;Long, Yi;Wu, Guixin;Li, Rui;Zhou, Mingming;He, Aiting and Jiang, Zhengying

Publication Date: Dec 05 ,2023

Journal: Annals of Intensive Care 13(1), pp. 121

Abstract: BACKGROUND: The prolonged beta-lactam antibiotics infusion has been an attractive strategy in severe infections, because it provides a more stable free drug concentration and a longer duration of free drug concentration above the minimum inhibitory concentration (MIC). We conducted this systematic review of randomized clinical trials (RCTs) with meta-analysis and trial sequential analysis (TSA) to compare the effects of prolonged vs intermittent intravenous infusion of beta-lactam antibiotics for patients with sepsis. METHODS: This study was prospectively registered on PROSPERO database (CRD42023447692). We searched EMBASE, PubMed, and Cochrane Library to identify eligible studies (up to July 6, 2023). Any study meeting the inclusion and exclusion criteria would be included. The primary outcome was all-cause mortality within 30 days. Two authors independently screened studies and extracted data. When the I2 values values Copyright © 2023. The Author(s).

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17. **Predicting sepsis-related mortality and ICU admissions from telephone triage information of**

patients presenting to out-of-hours GP cooperatives with acute infections: A cohort study of linked routine care databases.

Authors: Loots, Feike J.;Smits, Marleen;Jenniskens, Kevin;Leeuwenberg, Artuur M.;Giesen, Paul H. J.;Ramerman, Lotte;Verheij, Robert;van Zanten, Arthur R. H. and Venekamp, Roderick P.

Publication Date: 2023

Journal: PLoS ONE [Electronic Resource] 18(12), pp. e0294557

Abstract: BACKGROUND: General practitioners (GPs) often assess patients with acute infections. It is challenging for GPs to recognize patients needing immediate hospital referral for sepsis while avoiding unnecessary referrals. This study aimed to predict adverse sepsis-related outcomes from telephone triage information of patients presenting to out-of-hours GP cooperatives. METHODS: A retrospective cohort study using linked routine care databases from out-of-hours GP cooperatives, general practices, hospitals and mortality registration. We included adult patients with complaints possibly related to an acute infection, who were assessed (clinic consultation or home visit) by a GP from a GP cooperative between 2017-2019. We used telephone triage information to derive a risk prediction model for sepsis-related adverse outcome (infection-related ICU admission within seven days or infection-related death within 30 days) using logistic regression, random forest, and neural network machine learning techniques. Data from 2017 and 2018 were used for derivation and from 2019 for validation. RESULTS: We included 155,486 patients (median age of 51 years; 59% females) in the analyses. The strongest predictors for sepsis-related adverse outcome were age, type of contact (home visit or clinic consultation), patients considered ABCD unstable during triage, and the entry complaints"general malaise", "shortness of breath" and "fever". The multivariable logistic regression model resulted in a C-statistic of 0.89 (95% CI 0.88-0.90) with good calibration. Machine learning models performed similarly to the logistic regression model. A "sepsis alert" based on a predicted probability >1% resulted in a sensitivity of 82% and a positive predictive value of 4.5%. However, most events occurred in patients receiving home visits, and model performance was substantially worse in this subgroup (C-statistic 0.70). CONCLUSION: Several patient characteristics identified during telephone triage of patients presenting to out-of-hours GP cooperatives were associated with sepsis-related adverse outcomes. Still, on a patient level, predictions were not sufficiently accurate for clinical purposes. Copyright: © 2023 Loots et al. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

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18. **Patient and Hospital Characteristics Associated With the Interhospital Transfer of Adult Patients With Sepsis.**

Authors: Ofoma, Uchenna R.;Lanter, Tierney J.;Deych, Elena;Kollef, Marin;Wan, Fei and Joynt Maddox, Karen E.

Publication Date: Dec ,2023

Journal: Critical Care Explorations 5(12), pp. e1009

Abstract: IMPORTANCE: The interhospital transfer (IHT) of patients with sepsis to higher-capability hospitals may improve outcomes. Little is known about patient and hospital factors associated with sepsis IHT. OBJECTIVES: We evaluated patterns of hospitalization and IHT and determined patient and hospital factors associated with the IHT of adult patients with sepsis. DESIGN: Retrospective cohort study. SETTING AND PARTICIPANTS: A total of 349,938 adult patients with sepsis at 329 nonfederal hospitals in California, 2018-2019. MAIN OUTCOMES AND MEASURES: We evaluated patterns of admission and outward IHT between low sepsis-, intermediate sepsis-, and high sepsis-capability hospitals. We estimated odds of IHT using generalized estimating equations logistic regression with bootstrap stepwise variable selection. RESULTS: Among the cohort, 223,202 (66.4%) were initially hospitalized at high-capability hospitals and 10,870 (3.1%) underwent IHT. Nearly all transfers (98.2%) from low-capability hospitals were received at higher-capability hospitals. Younger

age (Copyright © 2023 The Authors. Published by Wolters Kluwer Health, Inc. on behalf of the Society of Critical Care Medicine

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19. **Development and validation of a machine learning model using electronic health records to predict trauma- and stressor-related psychiatric disorders after hospitalization with sepsis.**

Authors: Papini, Santiago;Iturralde, Esti;Lu, Yun;Greene, John D.;Barreda, Fernando;Sterling, Stacy A. and Liu, Vincent X.

Publication Date: Dec 18 ,2023

Journal: Transl Psychiatry Psychiatry 13(1), pp. 400

Abstract: A significant minority of individuals develop trauma- and stressor-related disorders (TSRD) after surviving sepsis, a life-threatening immune response to infections. Accurate prediction of risk for TSRD can facilitate targeted early intervention strategies, but many existing models rely on research measures that are impractical to incorporate to standard emergency department workflows. To increase the feasibility of implementation, we developed models that predict TSRD in the year after survival from sepsis using only electronic health records from the hospitalization (n = 217,122 hospitalizations from 2012-2015). The optimal model was evaluated in a temporally independent prospective test sample (n = 128,783 hospitalizations from 2016-2017), where patients in the highest-risk decile accounted for nearly one-third of TSRD cases. Our approach demonstrates that risk for TSRD after sepsis can be stratified without additional assessment burden on clinicians and patients, which increases the likelihood of model implementation in hospital settings. Copyright © 2023. The Author(s)

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20. **The microbial pathology of maternal perinatal sepsis: A single-institution retrospective five-year review.**

Authors: Powell, James;Crowley, Clare M.;Minihan, Brid;Imcha, Mendinaro;O'Connell, Nuala H.;Philip, Roy K. and Dunne, Colum P.

Publication Date: 2023

Journal: PLoS ONE [Electronic Resource] 18(12), pp. e0295210

Abstract: INTRODUCTION: Greater than half of in-hospital maternal deaths are caused by sepsis, a condition that occurs when infection exceeds local tissue containment and results in organ dysfunction. Determining the source of infection can be challenging. Microbiological cultures of the uterine cavity are often difficult to obtain, so antimicrobial susceptibility results may not be available to guide treatment. The aim of this retrospective study was to assess the potential clinical value of microbiology samples used in the maternal "septic screen" of patients in an Irish maternity hospital. METHODS: A review was completed of all maternal "septic screen" (i.e., high vaginal swabs, placenta swabs, blood cultures, throat swabs and urine samples) microbiology results from July 2016 to December 2021. RESULTS: In the relevant period, 845 patients were subject to a "septic screen", of whom 430 also had a placental swab collected. These 430 patients comprise our study population. 2% of blood cultures yielded potential pathogens, compared with 37%, 33%, 9% and 7% respectively for placental swabs, high vaginal swabs, throat swabs and urine specimens. 95% of blood cultures were sterile, compared with 52%, 0%, 0% and 53% respectively for placental swabs, high vaginal swabs, throat swabs and urine specimens. CONCLUSION: Of the five microbiological specimen types examined, placental swabs yielded the highest number of potential pathogens. Our results suggest that placental swabs are useful specimens for detecting potential pathogens from the uterine cavity, the most common source of perinatal infections. Copyright: © 2023 Powell et al. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

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21. **Association between hospital onset of infection and outcomes in sepsis patients - A**

propensity score matched cohort study based on health claims data in Germany.

Authors: Rose, Norman;Spoden, Melissa;Freytag, Antje;Pletz, Mathias;Eckmanns, Tim;Wedekind, Lisa;Storch, Josephine;Schlattmann, Peter;Hartog, Christiane S.;Reinhart, Konrad;Gunster, Christian and Fleischmann-Struzek, Carolin

Publication Date: Nov ,2023

Journal: Ijmm International Journal of Medical Microbiology 313(6), pp. 151593

Abstract: BACKGROUND: Hospital-acquired infections are a common source of sepsis. Hospital onset of sepsis was found to be associated with higher acute mortality and hospital costs, yet its impact on long-term patient-relevant outcomes and costs is unknown. OBJECTIVE: We aimed to assess the association between sepsis origin and acute and long-term outcomes based on a nationwide population-based cohort of sepsis patients in Germany. METHODS: This retrospective cohort study used nationwide health claims data from 23 million health insurance beneficiaries. Sepsis patients with hospital-acquired infections (HAI) were identified by ICD-10-codes in a cohort of adult patients with hospital-treated sepsis between 2013 and 2014. Cases without these ICD-10-codes were considered as sepsis cases with community-acquired infection (CAI) and were matched with HAI sepsis patients by propensity score matching. Outcomes included in-hospital/12-month mortality and costs, as well as readmissions and nursing care dependency until 12 months postsepsis. RESULTS: We matched 33,110 HAI sepsis patients with 28,614 CAI sepsis patients and 22,234 HAI sepsis hospital survivors with 19,364 CAI sepsis hospital survivors. HAI sepsis patients had a higher hospital mortality than CAI sepsis patients (32.8% vs. 25.4%, RR 1.3, p

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22. **Impact of antibiotic allergy labels on timely and appropriate antibiotics for sepsis in the emergency department.**

Authors: Rush, Lily;Rashidzada, Zohal;Cairns, Kelly;Roman, Cristina;Bourne, Thomas;Orosz, Judit;Poole, Susan;Lee, Sue J. and Peel, Trisha

Publication Date: Dec ,2023

Journal: JAC-Antimicrobial Resistance 5(6), pp. a120

Abstract: Objectives: Time to initiation of effective antibiotic therapy is a strong predictor of survival for patients with sepsis presenting to the Emergency Department (ED). Antibiotic allergy labels (AALs) are a known barrier to timely sepsis management. The aim was to evaluate the influence of AALs on timely sepsis management for ED sepsis presentations in an Australian hospital. Methods: A retrospective cohort study was conducted for ED presentations requiring direct ICU admission for suspected sepsis, comparing patients with and without an AAL using propensity scores. Results: Between November 2018 and June 2021, 377 patients were included. The prevalence of an AAL was 29.6% (86/377). The median time to antibiotic administration was similar in the AAL versus non-AAL groups (51 versus 60 min, P = 0.11); there was no difference in mortality (14.1% versus 14.0%, P = 0.98) and length of stay (9.21 versus 10.10 days). The median time to antibiotic administration was shorter in those with Emergency Medicine (EM) pharmacist attendance versus those without (50 versus 92 min, P = 0.0001). Appropriateness of antibiotic prescription was 91.0% (343/377) for the overall cohort and was not associated with AALs, possibly due to our clear antimicrobial sepsis guidelines; however, EM pharmacist involvement was associated with increased antibiotic appropriateness (97.3% versus 88.4%, P = 0.00048). Conclusions: In our Australian ED, AALs were not found to impact timeliness of antibiotic administration in patients with sepsis. EM pharmacist involvement was associated with improved timeliness and appropriateness of antibiotic selection in patients presenting with sepsis.

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23. **Sepsis and COVID-19: outcomes in young adults in intensive care.**

Authors: Santos, Talita Andrade;Oliveira, Jose Edilson de;Fonseca, Cassiane Dezoti da;Barbosa, Dulce Aparecida;Belasco, Angelica Goncalves da Silva and Miura, Carla Roberta Monteiro

Publication Date: 2023

Journal: Revista Brasileira De Enfermagem 76(6), pp. e20230037

Abstract: OBJECTIVE: to verify sepsis incidence among young adults admitted to intensive care due to COVID-19 and to analyze its association with demographic, clinical and outcome variables. METHODS: a quantitative, longitudinal, retrospective and analytical study, consisting of 58 adults aged 20 to 40 years in intensive care for SARS-CoV-2. It was carried out in a university hospital, from March 2020 to December 2021, with data collected from electronic medical records. RESULTS: sepsis incidence was 65%. Sepsis was associated with acute kidney injury, use of vasoactive drugs and mechanical ventilation, being admitted to the emergency room, severity according to the Simplified Acute Physiology Score III and bacterial pulmonary co-infection, the latter being the most frequent etiology for sepsis. CONCLUSIONS: there was a high sepsis incidence, with 42% of deaths, which points to the importance of investing in preventive measures, especially in relation to bacterial pulmonary coinfections.

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24. **A study on bacteriological profile in suspected cases of neonatal sepsis and its correlation with various biomarkers in the rural population of a university hospital.**

Authors: Sethi, Khilika;Verma, Rajesh K.;Yadav, Rajesh K.;Singh, Dharmendra P. and Singh, Sweta

Publication Date: Oct ,2023

Journal: Journal of Family Medicine & Primary Care 12(10), pp. 2313–2317

Abstract: Introduction: Neonatal sepsis is an infection in newborns that may be caused by bacteria, fungi, or viruses and has a high death and morbidity rate. The clinical presentation of sepsis may be rather general, making it challenging to make a diagnosis. While blood culture is the most accurate method to diagnose sepsis, it is also time-consuming. Because of this, it is crucial to locate other biomarkers like C-reactive protein (CRP), high sensitive C-reactive protein (hs-CRP), and procalcitonin (PCT) that may aid in early identification. Aim: To learn about the bacterial composition of suspected cases of neonatal sepsis in a tertiary care hospital in western Uttar Pradesh and how that composition relates to the biomarkers CRP, hs-CRP, and PCT. Materials and Methods: Hundred people who fulfilled the study's inclusion criteria were included. All neonatal venous blood samples have been obtained after receiving written informed permission from either parent. The conventional method was used to perform the blood culture. The ELISA technique has been used to determine hs-CRP along with serum PCT levels, while the latex agglutination test was utilized for CRP detection. Result: A total of 100 cases were enrolled, 78% presented within 3 days of birth. Blood culture was positive in 33 neonates (33%). There were 17 Gram-positive, 15 Gram-negative, and in all 2 cases with poly bacterial culture. CRP positivity rate was significantly higher in culture positive (57.6%) as compared to culture-negative neonates (25.4%). It was shown that a CRP >6 mg/l level was sensitive at 57.6% and specific at 74.6%. hs-CRP has a 100% sensitivity and 47.8% specificity. The PCT's sensitivity was 69.7%, whereas its specificity was 89.6%. Conclusion: PCT is more specific for detecting sepsis, but hs-CRP is more sensitive than CRP. The combination of PCT along with hs-CRP has a negative predictive value and high sensitivity compared to other markers. Thus, the most accurate predictors of neonatal sepsis would be a combination of factors. Copyright: © 2023 Journal of Family Medicine and Primary Care.

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25. **Prognostic differences in sepsis caused by gram-negative bacteria and gram-positive bacteria: a systematic review and meta-analysis.**

Authors: Tang, Aling;Shi, Yi;Dong, Qingqing;Wang, Sihui;Ge, Yao;Wang, Chenyan;Gong, Zhimin;Zhang, Weizhen and Chen, Wei

Publication Date: Nov 30 ,2023

Journal: Critical Care (London, England) 27(1), pp. 467

Abstract: BACKGROUND: Bacteria are the main pathogens that cause sepsis. The pathogenic mechanisms of sepsis caused by gram-negative and gram-positive bacteria are completely different, and their prognostic differences in sepsis remain unclear. METHODS: The PubMed, Web of Science, Cochrane Library, and Embase databases were searched for Chinese and English studies (January 2003 to September 2023). Observational studies involving gram-negative (G (-))/gram-positive (G (+)) bacterial infection and the prognosis of sepsis were included. The stability of the results was evaluated by sensitivity analysis. Funnel plots and Egger tests were used to check whether there was publication bias. A meta-regression analysis was conducted on the results with high heterogeneity to identify the source of heterogeneity. A total of 6949 articles were retrieved from the database, and 45 studies involving 5586 subjects were included after screening according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. Twenty-seven high-quality studies and 18 moderate-quality studies were identified according to the Newcastle-Ottawa Scale score. There was no significant difference in the survival rate of sepsis caused by G (-) bacteria and G (+) bacteria (OR 0.95, 95% CI 0.70-1.28). Subgroup analysis according to survival follow-up time showed no significant difference. The serum concentrations of C-reactive protein (CRP) (SMD = 0.39, 95% CI 0.02-0.76), procalcitonin (SMD = 1.95, 95% CI 1.32-2.59) and tumor necrosis factor-alpha (TNF-alpha) (MD = 0.31, 95% CI 0.25-0.38) in the G (-) bacterial infection group were significantly higher than those in the G (+) bacterial infection group, but there was no significant difference in IL-6 (SMD = 1.33, 95% CI - 0.18-2.84) and WBC count (MD = - 0.15, 95% CI - 0.96-00.66). There were no significant differences between G (-) and G (+) bacteria in D dimer level, activated partial thromboplastin time, thrombin time, international normalized ratio, platelet count, length of stay or length of ICU stay. Sensitivity analysis of the above results indicated that the results were stable. CONCLUSION: The incidence of severe sepsis and the concentrations of inflammatory factors (CRP, PCT, TNF-alpha) in sepsis caused by G (-) bacteria were higher than those caused by G (+) bacteria. The two groups had no significant difference in survival rate, coagulation function, or hospital stay. The study was registered with PROSPERO (registration number: CRD42023465051). Copyright © 2023. The Author(s).

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26. **Raise the Flag I: the impact of a sepsis quality improvement programme on delivery of a sepsis resuscitation bundle at a tertiary hospital in New Zealand.**

Authors: Walland, Katherine M.;Howard, Camilla;Paul, Odette and Huggan, Paul J.

Publication Date: Dec 15 ,2023

Journal: New Zealand Medical Journal 136(1587), pp. 75–84

Abstract: AIMS: To study changes in sepsis resuscitation practice at a tertiary hospital before and after the introduction of a quality improvement programme, and to identify variables associated with its delivery. METHODS: "Raise the Flag", a quality sepsis programme, including the Sepsis Six, was launched in 2018. Adult patients with sepsis were sampled prior to the intervention and during two subsequent periods. RESULTS: Clinicians were more likely to deliver the resuscitation bundle in the post-implementation period (adjusted odds ratio [aOR] 2.20, 95% confidence interval [CI] 1.27-3.79, p=0.005). This was not sustained at 18-30 months (aOR 1.22, 95% CI 0.89-1.66, p=0.21). After adjusting for potential confounders, each additional decade of patient age was associated with reduced odds of receiving the bundle (aOR 0.83, 95% CI 0.73-0.95, p=0.005). Admission to intensive care increased in the combined post-implementation periods (aOR 2.81, 95% CI 1.13-6.97, p=0.03). CONCLUSION: The odds of receiving a resuscitation bundle improved immediately following the launch of the Raise the Flag programme. Resuscitation practice differed based on patient age. Odds of admission to intensive care were increased. Copyright © PMA.

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27. **Ex Vivo Endotoxin Stimulation of Blood for Predicting Survival in Patients With Sepsis: A Systematic Review.**

Authors: Wheelwright, Jonathan;Halstead, E. Scott;Knehans, Amy and Bonavia, Anthony S.

Publication Date: Dec ,2023

Journal: CHEST Critical Care 1(3)

Abstract: BACKGROUND: Sepsis is a syndrome characterized by host immune dysfunction, with the extent of immunoparalysis differing among patients. Lipopolysaccharide (LPS) is used commonly to assess the immune function of critically ill patients with sepsis. However, the reliability of this ex vivo diagnostic test in predicting clinical outcomes remains uncertain. RESEARCH QUESTION: Does LPS-induced tumor necrosis factor (TNF) production from the blood of patients with sepsis predict mortality? Secondary outcomes included ICU and hospital stay durations, nosocomial infection rate, and organ recovery rate. STUDY DESIGN AND METHODS: Human sepsis studies from various databases through April 2023 were evaluated. Inclusion criteria encompassed LPS-stimulated blood assays, English language, and reported clinical outcomes. Bias risk was evaluated using the Newcastle-Ottawa scale (NOS). Relationships between TNF production and mortality were analyzed at sepsis onset and during established sepsis, alongside secondary outcomes. RESULTS: Of 11,580 studies, 17 studies (14 adult and three pediatric) were selected for analysis. Although 15 studies were evaluated as moderate to high quality using the NOS, it is important to note that some of these studies also had identifiable biases, such as unclear methods of participant recruitment. Nine studies detailed survival outcomes associated with LPS-induced TNF production at sepsis onset, whereas five studies explored TNF production's relationship with mortality during established sepsis. Trends suggested that lower LPS-induced TNF production correlated with higher mortality. However, heterogeneity in methodologies, especially the LPS assay protocol, hindered definitive conclusions. Publication bias was highlighted using funnel plot analysis. Concerning secondary outcomes, diminished TNF production might signify worsening organ dysfunction, although the link between cytokine production and nosocomial infection varied among studies. INTERPRETATION: For functional immune profiling in sepsis, streamlined research methodologies are essential. This entails organizing cohorts based on microbial sources of sepsis, establishing standardized definitions of immunoparalysis, using consistent types and dosages of immune stimulants, adhering to uniform blood incubation conditions, and adopting consistent clinical outcomes.

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28. **Hyperoxia for sepsis and development of acute lung injury with increased mortality.**

Authors: Yamamoto, Ryo;Fujishima, Seitaro;Yamakawa, Kazuma;Abe, Toshikazu;Ogura, Hiroshi;Saitoh, Daizoh;Gando, Satoshi and Sasaki, Junichi

Publication Date: Dec 14 ,2023

Journal: BMJ Open Respiratory Research 10(1)

Abstract: BACKGROUND: Supraphysiological oxygen administration causes unfavourable clinical outcomes in various diseases. This study aimed to determine whether hyperoxia would be associated with increased mortality in patients with severe infection. METHODS: A post-hoc analysis of a nationwide multicentre prospective observational study on sepsis (SPICE Study) was conducted, including adult patients admitted to the intensive care unit with available arterial partial pressure of oxygen (PaO2) at the treatment initiation for severe infection. Hyperoxia was defined as a PaO2 level of >=300 mm Hg and in-hospital mortality was compared between patients with and without hyperoxia. RESULTS: Of the 563 patients eligible for the study, 49 had hyperoxia at treatment initiation for severe infection. The in-hospital all-cause mortality rates of patients with and without hyperoxia were 14 (29.2%) and 90 (17.6%), respectively. Inverse probability weighting analyses with propensity scores revealed the association between hyperoxia and increased in-hospital mortality rate (28.8% vs 18.8%; adjusted OR 1.75 (1.03 to 2.97); p=0.038), adjusting for patient demographics, comorbidities, site of infection, severity of infection, haemodynamic and respiratory status, laboratory data and location of patient at infection development. Acute lung injury developed more frequently in patients with hyperoxia on the following days after infection treatment, whereas sepsis-related mortality was comparable regardless of hyperoxia exposure. CONCLUSION: Hyperoxia with PaO2 >=300 mm Hg at treatment

initiation of severe infection was associated with an increased in-hospital mortality rate in patients requiring intensive care. The amount of oxygen to administer to patients with severe infection should be carefully determined. TRIAL REGISTRATION NUMBER: University Hospital Medical Information Network Clinical Trial Registry (UMIN000027452).

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29. **Analysis of pathogenic factors on the death rate of sepsis patients.**

Authors: Ye, Luwei;Feng, Mei;Lin, Qingran;Li, Fang and Lyu, Jun

Publication Date: 2023

Journal: PLoS ONE [Electronic Resource] 18(12), pp. e0287254

Abstract: BACKGROUND: The Surviving Sepsis Campaign (SSC) believed that early identification of septic shock, aggressive fluid resuscitation and maintenance of effective perfusion pressure should be carried out. However, some of the current research focused on a single death factor for sepsis patients, based on a limited sample, and the research results of the relationship between comorbidities and sepsis related death also have some controversies. METHOD: Therefore, our study used data from a large sample of 9,544 sepsis patients aged 18-85 obtained from the MIMIC-IV database, to explore the risk factors of death in patients with sepsis. We used the general clinical information, organ dysfunction scores, and comorbidities to analyze the independent risk factors for death of these patients. RESULTS: The death group had significantly higher organ dysfunction scores, lower BMI, lower body temperature, faster heart rate and lower urine-output. Among the comorbidities, patients suffering from congestive heart failure and liver disease had a higher mortality rate. CONCLUSION: This study helps to identify sepsis early, based on a comprehensive evaluation of a patient's basic information, organ dysfunction scores and comorbidities, and this methodology could be used for actual clinical diagnosis in hospitals. Copyright: © 2023 Ye et al. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

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30. **A potential approach toward the management of sepsis: The extracorporeal cytokine hemadsorption therapy.**

Authors: Yildiz, A. B.;Copur, S.;Tanriover, C.;Yavuz, F.;Vehbi, S.;Hasbal, N. B. and Kanbay, M.

Publication Date: 2023

Journal: Seminars in Dialysis (pagination), pp. ate of Pubaton: 12 e 2023

Abstract: Infectious diseases are among the most common cause of morbidity and mortality among hospitalized patients while systemic inflammatory response syndrome is primarily attributed to the imbalance between pro-inflammatory and anti-inflammatory cytokines. Despite the improvements in the antibiotherapy alternatives and diagnostic modalities, the morbidity and mortality rates of sepsis and septic shock are relatively high among patients admitted to the intensive care units. Extracorporeal cytokine hemadsorption therapies are therapeutic approaches for such patient group with promising early results that especially have grown during COVID-19 pandemic. In this narrative review, our aim is to evaluate the current pre-clinical and clinical knowledge regarding the use of cytokine filtration systems among patients with septic shock.Copyright © 2023 Wiley Periodicals LLC.

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31. **Promoting Antibiotic Stewardship and Implementation of Sepsis Pathway in the Emergency Department: A Quality Improvement Initiative.**

Authors: Zia, Iqra and Zaidi, Syeda Kisa Fatima

Publication Date: Nov ,2023

Journal: Cureus 15(11), pp. e49275

Abstract: Introduction Sepsis is a preventable cause of mortality and presents challenges in triage and management. The Surviving Sepsis Campaign care bundles improve patient outcomes; however, non-compliance with guidelines, understaffing, and scarcity of training opportunities undermine care quality in resource-limited countries. We aimed to implement the sepsis hour-1 care bundle in the emergency department of a tertiary-care hospital in Pakistan and develop hospital antimicrobial guidelines. Methods The baseline assessment included a survey of knowledge and confidence in sepsis management and a retrospective audit of inpatient medical records. The inclusion criteria were age >= 18 years with a systemic inflammatory response score >= 2 or a National Early Warning Score >= 3. Improvement strategies included (a) educational intervention, (b) adult sepsis screening tool and sepsis 1-hour bundle checklist, and (c) recommendations for empirical antibiotics. These were implemented and assessed via Plan-Do-Study-Act (PDSA) cycles: (a) multi-tiered educational campaigns, (b) implementation of hospital protocols/guidelines, and (c) antimicrobial policy and sustainability. The process measures were hour-1 bundle components and the outcome measures were in-hospital mortality, ICU admission, length of hospital stay, and ICU stay. Results The baseline survey revealed that the majority of participants had formal training and felt confident in managing septic patients but none of the respondents had used a sepsis scoring system, and only 29.4% had used an hour-1 bundle previously. There was a sustained improvement in bundle compliance from 0% at baseline to 57.7% at PDSA-3. Inappreciable variation (p > 0.05) was reflected in the length of hospital and ICU stay and in-hospital mortality, whereas ICU admission decreased insignificantly (p > 0.05). The antimicrobial therapy practice, as per the guidelines, increased remarkably (p

Sources Used:

The following databases are used in the creation of this bulletin: EMBASE and Medline.

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