Oxford University Hospitals
NHS Foundation Trust
NHS

Bodleian Health Care Libraries

Bodleian Libraries
UNIVERSITY OF OXFORD

SEPSIS BULLETIN
13 April 2018

Adult Sepsis

Educational tools
The UK Sepsis Trust
A series of short films and documents to help guide clinical staff through the processes of understanding, identifying and managing sepsis.

Evaluation of oxidative stress and antioxidant status: Correlation with the severity of sepsis
Kumar, S. et al
Scand J Immunol. 2018 Apr;87(4):e12653
Sepsis is a condition caused by infection followed by unregulated inflammatory response which may lead to the organ dysfunction. During such condition, over-production of oxidants is one of the factors which contribute cellular toxicity and ultimately organ failure and mortality. Antioxidants having free radicals scavenging activity exert protective role in various diseases. This study suggests that imbalance between oxidant and antioxidant plays key role in the severity of sepsis.

Time course of immature platelet count and its relation to thrombocytopenia and mortality in patients with sepsis.
Kansuke K. et al
PLOS ONE January 30, 2018
The pathogenesis of thrombocytopenia in patients with sepsis is not fully understood. The aims of this study were to investigate changes in thrombopoietic activity over time by using absolute immature platelet counts (AIPC) and to examine the impact of platelet production on thrombocytopenia and mortality in patients with sepsis. Thrombopoietic activity was

Paediatric and Neonatal Sepsis

Neutrophil CD64 as a diagnostic marker for neonatal sepsis
Dai, J. et al
Adv Clin Exp Med. 2017;26(2):327–332
Neutrophil CD64 (nCD64) is a promising marker for diagnosing bacterial infections. Several studies have investigated the performance of nCD64 for diagnosing neonatal sepsis and the results are variable. Interest in nCD64 for detecting serious bacterial infections is increasing rapidly. The aim of the present study was to carry out a meta-analysis to systematically evaluate the
diagnostic accuracy of nCD64 in neonatal sepsis.

Soluble TREM-1 as a predictive factor of neonatal sepsis: a meta-analysis
Bellos, I. et al
Inflamm Res. 2018 Apr 11
The efficacy of soluble triggering receptor expressed on myeloid cell-1 (TREM-1) in detecting sepsis in adults has already been proven. To date, however, consensus in the field of neonatal sepsis is lacking. The purpose of the present systematic review is to accumulate current evidence in this field.

Strategies for preventing early-onset sepsis and for managing neonates at-risk: wide variability across six Western countries
Berardi, A. et al
J Matern Fetal Neonatal Med. 2018 Apr 1:1-7.
Group B streptococcus (GBS) early-onset sepsis (EOS) has declined after widespread intrapartum antibiotic prophylaxis. However, strategies for preventing EOS

generally maintained in the acute phase of sepsis. However, a decrease in AIPC after admission was independently associated with the development of severe thrombocytopenia and mortality, suggesting the importance of suppressed thrombopoiesis in the pathophysiology of sepsis-induced thrombocytopenia.

[Prognostic value of presepsin in adult patients with sepsis: Systematic review and meta-analysis](#)
Hyun S.Y. et al
PLOS ONE January 24, 2018
Presepsin is a novel biomarker to diagnose sepsis but its prognostic value has not been comprehensively reviewed. We conducted this meta-analysis to evaluate the mortality prediction value of presepsin in sepsis. This meta-analysis demonstrates some mortality prediction value in presepsin in patients with sepsis. Further studies are needed to define the optimal cut-off point to predict mortality in sepsis.

[Temporal Trends in Incidence, Sepsis-Related Mortality, and Hospital-Based Acute Care After Sepsis](#)
Meyer, N
Critical Care Medicine March 2018 - Volume 46 - Issue 3 - p 354–360
The primary objective was to measure temporal trends in sepsis survivorship and hospital-based acute care use in sepsis survivors. Owing to increasing incidence and declining mortality, the number of sepsis survivors at risk for hospital readmission rose significantly between 2010 and 2015. The 30-day hospital readmission rates for sepsis declined modestly but were offset by a rise in emergency department treat-and-release visits

[Risk factors and outcomes of sepsis-induced myocardial dysfunction and stress-induced cardiomyopathy in sepsis or septic shock: A comparative retrospective study.](#)
Jeong H.S. et al
Medicine (Baltimore) 2018 Mar;97(13):e0263
While both sepsis-induced myocardial dysfunction (SIMD) and stress-induced cardiomyopathy (SICMP) are common in patients with sepsis, the pathogenesis of the 2 diseases is different, and they require different treatment strategies. The SIMD and SICMP had different risk factors. The risk factors of SIMD were younger age, history of DM, history of HF, elevated NT pro-BNP, and positive result of blood culture. The elevated levels of lactate and troponin were identified as risk factors of SICMP. More importantly, in-hospital

may differ across countries. The analysis of their strategies allows to compare the effectiveness of prevention in different countries and suggests opportunities for improvement. Wide variations exists in preventing EOS. They depend on national epidemiology of GBS infections, compliance, cost, and feasibility of the strategy. The extreme variability of approaches for managing neonates at risk for EOS reflects the even greater uncertainty regarding this issue, and may explain the persisting, great use of resources to prevent a disease that has become very rare nowadays.

[Utility of serum resistin in the diagnosis of neonatal sepsis and prediction of disease severity in term and late preterm infants.](#)
Khattab, A.A. et al
J Perinat Med. 2018 Mar 31. Pii
Resistin is a proinflammatory hormone recently proposed as a sepsis biomarker. Our aim was to evaluate the diagnostic and prognostic values of this marker in neonatal sepsis. This is a prospective observational study that includes 60 term and late preterm neonates with proven and possible sepsis besides 30 healthy controls. Resistin and other biomarkers, like C-reactive protein (CRP), were measured within 2 h of neonatal intensive care unit (NICU) admission. Infants were monitored and the primary outcome was 30-day mortality.

[C-reactive protein and immature-to-total neutrophil ratio have no utility in guiding lumbar puncture in suspected neonatal sepsis.](#)
Goldfinch, C.D. et al
J Paediatr Child Health. 2018 Mar 30.
Meningitis may complicate neonatal sepsis, but there is scant evidence to inform the decision to perform a lumbar puncture (LP) and considerable variation in practice. We investigated whether inflammatory markers - C-reactive protein (CRP) and immature-to-total neutrophil ratio (ITR) - were predictive of meningitis or significant cerebrospinal fluid (CSF) pleocytosis and useful in guiding the decision to perform a LP. CRP and ITR perform poorly in identifying infants with confirmed or probable meningitis. The decision to perform an LP should be more focused on clinical grounds and/or a positive blood culture and less on inflammatory or haematological markers in isolation.

mortality rate from SIMD and SICMP showed increased trend and worse outcome in SIMD group with reduced EF<30%. Thus, developing SIMD or SICMP reflected poor prognosis in sepsis or septic shock.

[Difference between elderly and non-elderly patients in using serum lactate level to predict mortality caused by sepsis in the emergency department](#)
Cheng, H-H. et al
Medicine: March 2018 - Volume 97 - Issue 13 - p e0209
Elderly people are more susceptible to sepsis and experience more comorbidities and complications than young adults. Serum lactate is a useful biomarker to predict mortality in patients with sepsis. Lactate production is affected by the severity of sepsis, organ dysfunction, and adrenergic stimulation. We evaluated the difference in serum lactate level between the elderly and non-elderly septic patients by using multiple regression models.

[Accuracy of quick Sequential Organ Failure Assessment (qSOFA) score and systemic inflammatory response syndrome (SIRS) criteria for predicting mortality in hospitalized patients with suspected infection: A meta-analysis of observational studies: Predictive accuracy of qSOFA: A meta-analysis.](#)
Maitra, S. et al
Clin Microbiol Infect. 2018 Mar 29.
This meta-analysis followed MOOSE consensus statement for conducting and reporting the results of systematic review. PubMed & EMBASE were searched for the observational studies which reported predictive utility of qSOFA score for predicting mortality in patients with suspected or proven infection with the following search words: 'qSOFA', 'q-SOFA', 'quick-SOFA', 'Quick Sequential Organ Failure Assessment', 'quick SOFA'. Sensitivity, specificity, area under receiver operating characteristic curves (ROC) with 95% confidence interval of qSOFA and SIRS criteria for predicting in-hospital mortality was collected for each study and a 2x2 table was created for each study. qSOFA has been found to be a poorly sensitive predictive marker for in-hospital mortality in hospitalized patients with suspected infection. It is reasonable to recommend developing another scoring system with higher sensitivity to identify high-risk patients with infection.

[Routine screening for colonization by Gram-negative bacteria in neonates at intensive care units for the prediction of sepsis: systematic review and meta-analysis](#)
Seidel, J. et al
J Hosp Infect. 2018 Mar 22. Pii
At neonatal intensive care units sepsis due to Gram-negative bacteria is an important cause of morbidity and mortality. The benefits of routine microbiological screening of neonatal body surface to predict and prevent sepsis are controversial. The aim was to evaluate the prognostic value of neonatal body surface screening for colonization with Gram-negative bacteria for the prediction of late-onset sepsis (LoS). Limited evidence of very low quality exists regarding the prognostic value of neonatal screening for LoS. Carefully planned and conducted prospective studies, including randomized trials, are needed to clarify the potential value of this measure for the prediction and prevention of LoS.

[Cytokine profile as diagnostic and prognostic factor in neonatal sepsis](#)
Leal, Y.A. et al
J Matern Fetal Neonatal Med. 2018 Mar 21:1-7
The serum levels of some cytokines can be useful in the diagnosis of neonatal sepsis; the prognostic value of a cytokine profile has not, to our knowledge, been explored in this disease. Sepsis was evaluated in 96 high-risk neonates. We assessed cytokine levels on hospital admission and during or not during sepsis. In neonates with high risk for the development of sepsis, there is an association between levels of IL-6, IL-10, and G-SCF and the disease development/outcome.

[Vitamin D deficiency and vitamin D receptor variants in mothers and their neonates are risk factors for neonatal sepsis.](#)
Tayel, I.S. et al
Steroids. 2018 Mar 10. Pii
Increasing prevalence of neonatal sepsis in recent years catch attention to early prevention and management. Vitamin D receptor (VDR) polymorphism can modulate VDR expression level that greatly influences immunity and susceptibility to microbial infections. We aimed to investigate the association of VDR polymorphism at FokI, rs2228570 T/C, and TaqI, rs731236 C/T gene with serum 25-hydroxyvitamin D level and risk of neonatal sepsis. Vitamin D deficiency in mothers/neonates is a risk factor for neonatal

[Effect of levosimendan on mortality in severe sepsis and septic shock: a meta-analysis of randomised trials.](#)
Chang, W. et al
BMJ Open. 2018 Mar 30;8(3):e019338
A collection of databases including PubMed, EMBASE, Cochrane Central Register and Web of Science were searched updated to August 2017. Randomised trials were included when they pertain to the use of levosimendan in severe sepsis or septic shock compared with any category of inotropes, or as an adjunct to standard therapy with mortality reported. The primary outcome was mortality, and the secondary outcomes were clinical performances including serum lactate, cardiac function, vasopressor requirement and fluid infusion. Current evidence is not sufficient to support levosimendan as superior to dobutamine or as an optimal adjunct in severe sepsis and septic shock. More large-scale randomised trials are necessary to validate levosimendan use in sepsis.

sepsis. VDR FokI T allele had lower 25-hydroxyvitamin D level that may predispose to sepsis hazards.

Why are preterm newborns at increased risk of infection?
Collins, A. et al
Arch Dis Child Fetal Neonatal Ed. 2018 Jan 30.
One in 10 newborns will be born before completion of 36 weeks' gestation (premature birth). Infection and sepsis in preterm infants remain a significant clinical problem that represents a substantial financial burden on the healthcare system. While no single review can cover all aspects of immune function in this population, we will discuss key aspects of preterm neonatal innate and adaptive immune function that place them at high risk for developing infections and sepsis, as well as sepsis-associated morbidity and mortality.