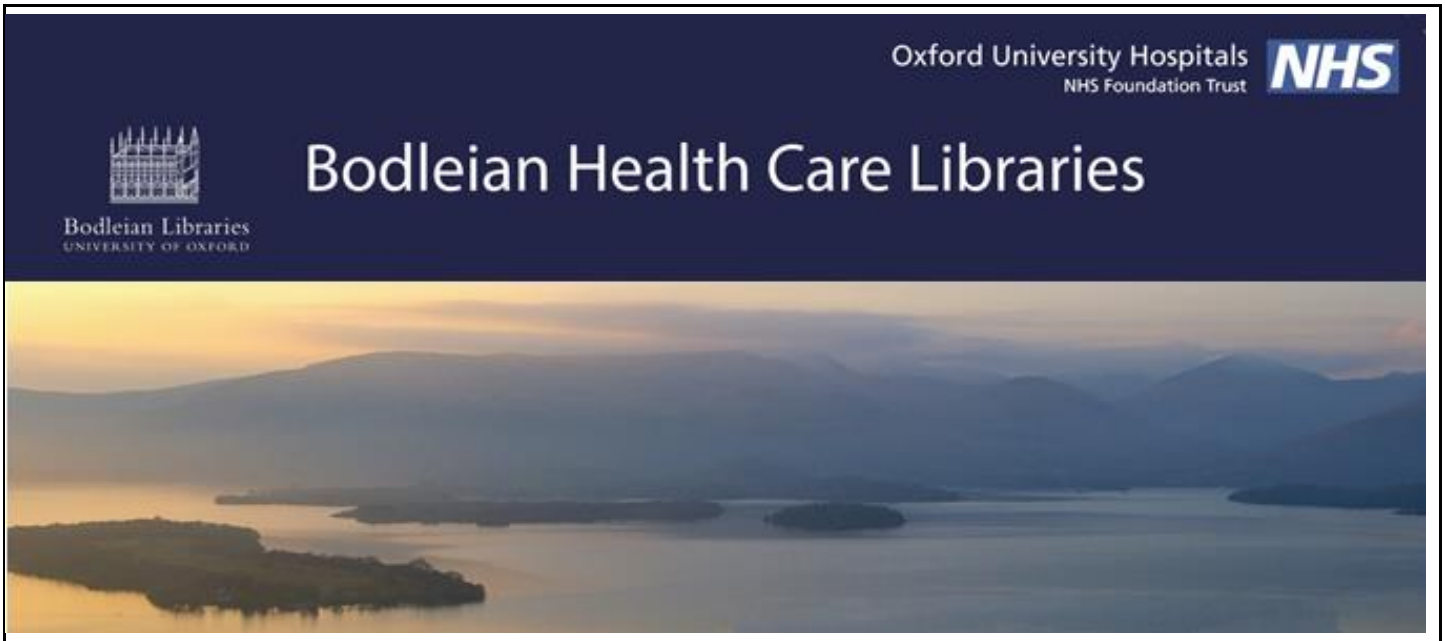
Here is the latest edition of the Sepsis Bulletin. The bulletin covers the latest information on sepsis and comes out monthly. Next edition is due March 2021. Older editions are available as pdfs on the Keeping Up To Date library guide (http://libguides.bodleian.ox.ac.uk/Keeping_up_to_date)

Please let me know if there is anything you would like to see highlighted in the bulletin

Please also pass the bulletin on to other interested people and encourage them to sign up. Anyone can be added to the mailing list.

To support you further in keeping up to date, we have a current awareness service, **KnowledgeShare**. You let us know about the different areas you are interested in (for example lung cancer, leadership, orthopaedics, infection control, patient safety, etc.) and we send out an email fortnightly with any new high-level reports, studies, guidelines which match. This is a free service. For more information see our guide. To sign up, fill out our form: https://ox.libguides.com/ld.php?content_id=31673730
Here is your January 2021 edition of the Sepsis Bulletin which covers the latest information on Sepsis. Older editions are available as pdfs on the Keeping Up To Date library guide (http://libguides.bodleian.ox.ac.uk/Keeping_up_to_date).



SEPSIS BULLETIN
February 2021

Sepsis

Diagnosing serious infections in older adults presenting to ambulatory care: a systematic review
Struyf T, Boon HA, van de Pol AC, et al
Age Ageing. 502: 405-414. 2021
We summarise all available evidence on the accuracy of clinical features and blood tests for diagnosing serious infections in older patients presenting to ambulatory care. We found few studies on the diagnostic accuracy of clinical features and blood tests to detect serious infections in older people presenting to ambulatory care. The risk of bias was mostly moderate to high, leading to substantial uncertainty.

Frailty is associated with long-term outcome in patients with sepsis who are over 80 years old: results from an observational study in 241 European ICUs
Haas LEM, Boumendil A, Flaatten H, et al
Age and ageing. 20. 2021
Sepsis is one of the most frequent reasons for acute intensive care unit (ICU) admission of very old patients and mortality rates are high. However, the impact of pre-existing physical and cognitive function on long-term outcome of ICU patients>=80 years old (very old intensive care patients (VIPs)) with sepsis is unclear. We investigate both the short- and long-term mortality of VIPs admitted with sepsis and assess the relation of mortality with pre-existing physical and cognitive function. There is substantial long-term mortality in VIPs admitted with sepsis. Frailty, age and disease severity were identified as predictors of long-term mortality in VIPs admitted with sepsis.
[Mortality in sepsis and septic shock in Germany. Results of a systematic review and meta-analysis]
Bauer M, Groesdonk HV, Preissing F, et al
Anaesthesist. Epub ahead of print 2021/02/10. 2021
The reported mortality for sepsis and septic shock varies between 15% and 59% in international comparison. For Germany, the number of studies is limited. Previous estimations of mortality in Germany are outdated or based on claims data analyses. Various authors discuss whether lacking quality initiatives and treatment standards in Germany could cause higher mortality for sepsis. This contrasts with the internationally well-recognized performance of the German intensive care infrastructure during the COVID-19 pandemic. The objectives of this systematic review and meta-analysis were to estimate 30-day and 90-day mortality of patients with sepsis and patients with septic shock in Germany and to compare the mortality with that of other industrialized regions (Europe, North America). Our analysis does not support the notion that mortality related to sepsis and septic shock in Germany is higher in international comparison. A higher mortality would not be obvious either, since intensive care, for example also during the COVID-19 pandemic, is regarded as exemplary in Germany and the structural quality, such as the number of intensive care beds per 100,000 inhabitants, is high in international comparison. Nevertheless, deficits could also exist outside intensive care medicine. A comparison of international individual studies should take greater account of the structure of healthcare systems, the severity of disease and the limitations resulting from the data sources used.
A new prediction model for acute kidney injury in patients with sepsis
Fan C, Ding X and Song Y
Annals of palliative medicine. 102: 1772-1778. 2021
Acute kidney injury is common in patients with sepsis and contributes to poor prognosis and mortality. Early identification of high-risk patients can provide evidence for clinical decision-making. This prediction model allows clinicians to quickly assess the risk of sepsis-associated acute kidney injury (SA-AKI) at an early stage. Accordingly, clinicians can implement more medical measures that are considered beneficial to patients with sepsis.
Carbapenem Therapeutic Drug Monitoring in Critically Ill Adult Patients and Clinical Outcomes: A Systematic Review with Meta-Analysis
Lechtig-Wasserman S, Liebisch-Rey H, Diaz-Pinilla N, et al
Antibiotics Basel. 102. 2021
Drug monitoring is one strategy of antibiotic stewardship to face antimicrobial resistance. This strategy could have a determinant role in critically ill patients treated with carbapenems to overcome pharmacokinetic variability, reduce the risk of subtherapeutic dosage or toxicity, and reduce the risks inherent to treatment. However, the effectiveness of therapeutic drug monitoring (TDM) is unknown. This paper aims to identify TDM effectiveness in critically ill patients treated with carbapenems. English and ClinicalTrials.gov databases were searched to identify relevant studies evaluating carbapenem TDM. Randomized controlled trials (RCTs) and comparative cohort studies were selected for inclusion if they compared carbapenem TDM to standard care in adult critically ill or sepsis/septic shock patients. The primary outcome was mortality. Secondary outcomes included morbidity, clinical cure, microbiological eradication, antimicrobial resistance, drug-related side effects, and achievement of target plasma concentrations. Overall, performing carbapenem TDM was not associated with a decrease in mortality. However, it could be evidence for a relationship with clinical cure as well as target attainment. Some studies found favorable outcomes related to clinical and

microbiological responses, such as lower procalcitonin levels at the end of the monitored therapy compared to standard care. For the primary and secondary outcomes analyzed, strong evidence was not identified, which could be due to the size, risk of bias, and design of selected studies.

Impact of Accelerate Pheno and BacT/ALERT VIRTUO on Clinical Processes and Outcomes in Patients with Sepsis and Concurrent Gram-Negative Bacteremia

Babowicz F, LaPlante R, Mitchell C, et al

Antimicrobial agents and chemotherapy. 22. 2021

Accelerate Pheno system and BacT/ALERT VIRTUO may improve bacteremia management. This study evaluated the impact of both devices on outcomes in patients with sepsis and concurrent gram-negative bacteremia. The implementation of BacT/Alert VIRTUO and the Accelerate Pheno system improved microbiology laboratory processes, antibiotic utilization processes and clinical outcomes. These data support the use of rapid diagnostics in sepsis with concurrent gram-negative bacteremia. Copyright © 2021 American Society for Microbiology.

Long noncoding plasmacytoma variant translocation 1 facilitates the surveillance of acute respiratory distress syndrome and mortality prediction in sepsis

Liu Y, Peng H and Gui F

Biomarkers in medicine. 18. 2021

We aimed to investigate the association of long noncoding RNA plasmacytoma variant translocation 1 (lncRNA PVT1) expression with acute respiratory distress syndrome (ARDS) risk and its prognostic value for 28-day mortality in sepsis patients. Material(s) and LncRNA PVT1 may facilitate the surveillance of ARDS, general disease severity and the prediction of mortality in sepsis patients.

Coagulation phenotypes in sepsis and effects of recombinant human thrombomodulin: an analysis of three multicentre observational studies

Kudo D, Goto T, Uchimido R, et al

Critical Care. 251. 2021

A recent randomised trial showed that recombinant thrombomodulin did not benefit patients who had sepsis with coagulopathy and organ dysfunction. Several recent studies suggested presence of clinical phenotypes in patients with sepsis and heterogenous treatment effects across different sepsis phenotypes. We examined the latent phenotypes of sepsis with coagulopathy and the associations between thrombomodulin treatment and the 28-day and in-hospital mortality for each phenotype. We identified four coagulation marker-based sepsis phenotypes. The treatment effects of thrombomodulin varied across sepsis phenotypes. This finding will facilitate future trials of thrombomodulin, in which a sepsis phenotype with high FDP and D-dimer can be targeted. Copyright © 2021, The Author(s).

Identification of novel sublingual parameters to analyze and diagnose microvascular dysfunction in sepsis: the NOSTRADAMUS study

Rovas A, Sackarnd J, Rossaint J, et al

Critical Care. 252. 2021

The availability of handheld, noninvasive sublingual video-microscopes allows for visualization of the microcirculation in critically ill patients. Recent studies demonstrate that reduced numbers of blood-perfused microvessels and increased penetration of erythrocytes into the endothelial glycocalyx are essential components of microvascular dysfunction. The aim of this study was to identify novel microvascular variables to determine the level of microvascular dysfunction in sepsis and its relationship with clinical variables. We introduce new important diameter-specific quantification and differentiated analysis of RBC kinetics, a key to understand microvascular dysfunction in sepsis. MVHS dynamic, which has a broad bandwidth to detect microvascular (dys-) function, might serve as a valuable tool to detect microvascular impairment in critically ill patients.

Sepsis in the urgent care setting

Klick B and Guins T

Current Problems in Pediatric and Adolescent Health Care. 512. 2021

Sepsis, in particular severe sepsis, is a major cause of morbidity and mortality in pediatrics. It is most likely to affect very young children and children with significant medical comorbidities. The definition of sepsis in pediatrics is currently rapidly evolving but the best treatment for children with severe sepsis remains early

goal directed therapy with intravenous fluids and antibiotics. It is therefore important for any pediatric urgent care providers to be able to recognize and treat patients with severe sepsis. It is also important for pediatric urgent care providers to be aware of certain groups of patients who have an increased risk of mortality when they develop sepsis. This article summarizes the current understanding of pediatric sepsis and then focuses on the management of these patients in the pediatric urgent care setting, with special attention paid to groups at higher risks of negative outcomes. Co

Use of sepsis-related diagnostic criteria in primary care: a survey among general practitioners

Mulders MCF, Loots FJ, van Nieuwenhoven J, et al

Family practice. 23. 2021

Use of sepsis-criteria in hospital settings is effective in realizing early recognition, adequate treatment and reduction of sepsis-associated morbidity and mortality. Whether general practitioners (GPs) use these diagnostic criteria is unknown. We gauge the knowledge and use of various diagnostic criteria. To determine which parameters GPs associate with an increased likelihood of sepsis. GPs mostly use gut feeling to diagnose sepsis and are frequently not familiar with the 'sepsis-criteria' used in hospital settings, although clinical reasoning was mostly in line with the qSOFA score. In order to improve sepsis recognition in primary care, GPs should be educated in the use of available screening tools.

Effect of nurse-led, goal-directed lung physiotherapy on prognosis of patients with sepsis caused by Acinetobacter baumannii pulmonary infection

Chen J, Zhou R, Li Z, et al

Int J Infect Dis. 103: 167-172. 2021

We investigate the role of nurse-led, goal-directed lung physiotherapy on the prognosis of patients with sepsis caused by Acinetobacter baumannii pulmonary infection. Nurse-led, goal-directed lung physiotherapy shortened the duration of mechanical ventilation and ICU stay, and decreased ICU mortality and 28-day mortality in patients with sepsis caused by A. baumannii pulmonary infection.

The surviving sepsis campaign: fluid resuscitation and vasopressor therapy research priorities in adult patients

Coopersmith CM, De Backer D, Deutschman CS, et al

Intensive Care Medicine Experimental. 91. 2021

We expand upon the priorities of fluid resuscitation and vasopressor therapy research priorities identified by a group of experts assigned by the Society of Critical Care Medicine and the European Society of Intensive Care Medicine. In the second of a series of manuscripts subsequent to the original paper, members with expertise in the subjects expound upon the three identified priorities related to fluid resuscitation and vasopressor therapies. This analysis summarizes what is known and what were identified as ongoing and future research.

National Preclinical Sepsis Platform: developing a framework for accelerating innovation in Canadian sepsis research

Mendelson AA, Lansdell C, Fox-Robichaud AE, et al

Intensive Care Medicine Experimental. 92. 2021

Despite decades of preclinical research, no experimentally derived therapies for sepsis have been successfully adopted into routine clinical practice. Factors that contribute to this crisis of translation include poor representation by preclinical models of the complex human condition of sepsis, bias in preclinical studies, as well as limitations of single-laboratory methodology. To overcome some of these shortcomings, multicentre preclinical studies-defined as a research experiment conducted in two or more research laboratories with a common protocol and analysis-are expected to maximize transparency, improve reproducibility, and enhance generalizability. The ultimate objective is to increase the efficiency and efficacy of bench-to-bedside translation for preclinical sepsis research and improve outcomes for patients with life-threatening infection. To this end, we organized the first meeting of the National Preclinical Sepsis Platform (NPSP). This multicentre preclinical research collaboration of Canadian sepsis researchers and stakeholders was established to study the pathophysiology of sepsis and accelerate movement of promising therapeutics into early phase clinical trials. Integrated knowledge translation and shared decision-making were emphasized to ensure the goals of the platform align with clinical researchers and patient partners. 29 participants from 10 independent labs attended and discussed four main topics: (1) objectives of the

platform; (2) animal models of sepsis; (3) multicentre methodology and (4) outcomes for evaluation. A PIRO model (predisposition, insult, response, organ dysfunction) for experimental design was proposed to strengthen linkages with interdisciplinary researchers and key stakeholders. This platform represents an important resource for maximizing translational impact of preclinical sepsis research. Copyright © 2021, The Author(s).

Comparison of Troponin I levels versus myocardial dysfunction on prognosis in sepsis

Innocenti F, Palmieri V, Stefanone VT, et al

Internal and emergency medicine. 17. 2021

In the context of sepsis, we tested the relationship between echocardiographic findings and Troponin, and their impact on prognosis. In this prospective study, we enrolled 325 septic patients (41% with shock), not mechanically ventilated, between October, 2012 and June, 2019 among those admitted to our High-Dependency Unit. While abnormal Troponin levels were associated with SIMD diagnosed by echocardiography, only the presence of SIMD predicted the short- and medium-term mortality rate, without an independent contribution of increased Troponin levels.

Are thromboelastometric and thromboelastographic parameters associated with mortality in septic patients? A systematic review and meta-analysis

Boscolo A, Spiezia L, De Cassai A, et al

J Crit Care 61: 5-13. 2021

Thromboelastometry/elastography (ROTEM/TEG) showed promising results for diagnosis of sepsis-induced coagulopathy, but their association with the outcome is unclear. Our aim was to assess any difference in ROTEM/TEG measurements between septic survivors and non-survivors. Hypocoagulability and lower MCF in EXTEM may be associated with higher mortality in sepsis.

Machine Learning-Based Early Warning Systems for Clinical Deterioration: Systematic Scoping Review

Muralitharan S, Nelson W, Di S, et al

J Med Internet Res. 232: e25187. 2021

Timely identification of patients at a high risk of clinical deterioration is key to prioritizing care, allocating resources effectively, and preventing adverse outcomes. Vital signs-based, aggregate-weighted early warning systems are commonly used to predict the risk of outcomes related to cardiorespiratory instability and sepsis, which are strong predictors of poor outcomes and mortality. Machine learning models, which can incorporate trends and capture relationships among parameters that aggregate-weighted models cannot, have recently been showing promising results. This study aimed to identify, summarize, and evaluate the available research, current state of utility, and challenges with machine learning-based early warning systems using vital signs to predict the risk of physiological deterioration in acutely ill patients, across acute and ambulatory care settings. In studies that compared performance, reported results suggest that machine learning-based early warning systems can achieve greater accuracy than aggregate-weighted early warning systems but several areas for further research were identified. While these models have the potential to provide clinical decision support, there is a need for standardized outcome measures to allow for rigorous evaluation of performance across models. Further research needs to address the interpretability of model outputs by clinicians, clinical efficacy of these systems through prospective study design, and their potential impact in different clinical settings.

Effect of Vitamin C, Thiamine, and Hydrocortisone on Ventilator- and Vasopressor-Free Days in Patients With Sepsis: The VICTAS Randomized Clinical Trial

Sevransky JE, Rothman RE, Hager DN, et al

Jama. 3258: 742-750. 2021

Sepsis is a common syndrome with substantial morbidity and mortality. A combination of vitamin C, thiamine, and corticosteroids has been proposed as a potential treatment for patients with sepsis. We determine whether a combination of vitamin C, thiamine, and hydrocortisone every 6 hours increases ventilator- and vasopressor-free days compared with placebo in patients with sepsis. Among critically ill patients with sepsis, treatment with vitamin C, thiamine, and hydrocortisone, compared with placebo, did not significantly increase ventilator- and vasopressor-free days within 30 days. However, the trial was terminated early for administrative reasons and may have been underpowered to detect a clinically important difference. TRIAL REGISTRATION: ClinicalTrials.gov Identifier: NCT03509350.

Impact of the timeliness of antibiotic therapy on the outcome of patients with sepsis and septic shock
Asner SA, Desgranges F, Schrijver IT, et al
Journal of Infection. 2021
We review the impact of the timeliness of antibiotic therapy on the outcome of patients with sepsis or septic shock. While two-thirds of sepsis studies reported an association between early administration of antibiotic therapy and patient outcome, the time-to-antibitiocs metrics varied significantly across studies and no robust time thresholds emerged. Copyright © 2021
Screening of key genes of sepsis and septic shock using bioinformatics analysis
Zeng X, Feng J, Yang Y, et al
Journal of Inflammation Research. 14: 829-841. 2021
Sepsis is a disease associated with high mortality. We performed bioinformatic analysis to identify key biomarkers associated with sepsis and septic shock. This study identified several potential diagnostic genes and inflammatory and metabolic responses mechanisms associated with the development of sepsis. Copyright © 2021 Zeng et al.
Efficacy and safety of cefiderocol or best available therapy for the treatment of serious infections caused by carbapenem-resistant Gram-negative bacteria CREDIBLE-CR: a randomised, open-label, multicentre, pathogen-focused, descriptive, phase 3 trial
Bassetti M, Echols R, Matsunaga Y, et al
Lancet Infect Dis. 212: 226-240. 2021
New antibiotics are needed for the treatment of patients with life-threatening carbapenem-resistant Gram-negative infections. We assessed the efficacy and safety of cefiderocol versus best available therapy in adults with serious carbapenem-resistant Gram-negative infections. Cefiderocol had similar clinical and microbiological efficacy to best available therapy in this heterogeneous patient population with infections caused by carbapenem-resistant Gram-negative bacteria. Numerically more deaths occurred in the cefiderocol group, primarily in the patient subset with Acinetobacter spp infections. Collectively, the findings from this study support cefiderocol as an option for the treatment of carbapenem-resistant infections in patients with limited treatment options. FUNDING: Shionogi.
Effect of aspirin on deaths associated with sepsis in healthy older people ANTISEPSIS: a randomised, double-blind, placebo-controlled primary prevention trial
Eisen DP, Leder K, Woods RL, et al
Lancet Respir Med. 92: 186-195. 2021
BACSepsis is a serious global health issue and a major cause of death and disability. The availability of a simple, community-based preventive strategy could substantially reduce the burden of sepsis. We aimed to establish whether low-dose aspirin reduced deaths or hospital admissions associated with sepsis in older people. Daily low-dose aspirin treatment did not reduce deaths associated with sepsis in community dwelling older adults. Our findings do not support the use of aspirin as a primary prevention strategy to reduce the burden of sepsis in this population. FUNDING: National Health and Medical Research Council of Australia, National Institutes of Health, Monash University.
Impact of Sepsis Flow Chip, a novelty fast microbiology method, in the treatment of bacteremia caused by Gram-negative bacilli
Merino E, Gimeno A, Alcalde M, et al
Revista espanola de quimioterapia : publicacion oficial de la Sociedad Espanola de Quimioterapia. 23. 2021
The aim of this study was to assess the impact of the information provided by the new Sepsis Chip Flow system (SFC) and other fast microbiological techniques on the selection of the appropriate antimicrobial treatment by the clinical researchers of an antimicrobial stewardship team. From the theoretical model the Gram stain and the MALDI-TOF results achieved a reduction in the combined treatment. However, the new system tested (SFC), due to the resistance mechanism data provided, not only reduced the combined treatment, it also decreased the prescription of the carbapenems.
Lactate/albumin ratio is more effective than lactate or albumin alone in predicting clinical outcomes in intensive care patients with sepsis
Cakir E and Turan IO
Scandinavian Journal of Clinical and Laboratory Investigation. 2021

This study aimed to compare the value of lactate, albumin, and lactate/albumin ratio for the prediction of mortality in sepsis patients. Lactate/albumin ratio is an easily obtained parameter with potential value for critically ill patients. Copyright © 2021 Medisinsk Fysiologisk Forenings Forlag (MFFF).

Evaluation of Evidence, Pharmacology, and Interplay of Fluid Resuscitation and Vasoactive Therapy in Sepsis and Septic Shock

Barlow B and Bissell BD

Shock. 23. 2021

We sought to review the pharmacology of vasoactive therapy and fluid administration in sepsis and septic shock, with specific insight into the physiologic interplay of these agents. Current guidelines are not in alignment with the data available, which suggests a potential benefit from low dose fluid administration and early vasopressor exposure. Future data must account for the impact of both of these pharmacotherapies when assessing clinical outcomes and should assess personalization of therapy based on the possible interaction. Copyright © 2021 by the Shock Society.

Microfluidics for sepsis early diagnosis and prognosis: a review of recent methods

Zhang Y, Zhou Y, Yang Y, et al

The Analyst. 10. 2021

Sepsis is a complex disorder of immune system response to infections that can be caused by a wide range of clinical contexts. Traditional methods for sepsis detection include molecular diagnosis, biomarkers either based on protein concentration or cell surface expression, and microbiological cultures. Development of point-of-care (POC) instruments, which can provide high accuracy and consume less time, is in unprecedented demand. Within the past few years, applications of microfluidic systems for sepsis detection have achieved excellent performance. In this review, we discuss the most recent microfluidic applications specifically in sepsis detection, and propose their advantages and disadvantages. We also present a comprehensive review of other traditional and current sepsis diagnosis methods to obtain a general understanding of the present conditions, which can hopefully direct the development of a new sepsis roadmap.

Microfluidics for sepsis early diagnosis and prognosis: a review of recent methods

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NEWS2

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No article

Neonatal, paediatric and maternal sepsis

top

Brain death in pregnancy: a systematic review focusing on perinatal outcomes

Dodaro MG, Seidenari A, Marino IR, et al

Am J Obstet Gynecol. Epub ahead of print 2021/02/19. 2021

Brain death (BD) during pregnancy might justify in select cases maternal somatic support to obtain fetal viability and maximize perinatal outcome. This study is a systematic review of the literature on cases of brain death in pregnancy with attempt to prolong pregnancy to assess perinatal outcomes. In 35 cases of brain death in pregnancy at a mean gestation age of 20 weeks, maternal somatic support aimed at maximizing perinatal outcome lasted for about 7 weeks, with 77% of neonates being born alive and 85% of these infants

having a normal outcome at 20 months of life. The data of this study will be helpful in counseling families and practitioners faced with such rare and complex cases.

Antibiotic resistance patterns of bacterial isolates from neonatal sepsis patients at university hospital of Leipzig, Germany

Tessema B, Lippmann N, Knupfer M, et al

Antibiotics. 103. 2021

Neonatal sepsis caused by resistant bacteria is a worldwide concern due to the associated high mortality and increased hospitals costs. Bacterial pathogens causing neonatal sepsis and their antibiotic resistance patterns vary among hospital settings and at different points in time. This study aimed to determine the antibiotic resistance patterns of pathogens causing neonatal sepsis and to assess trends in antibiotic resistance. The high levels of antibiotic resistance patterns highlight the need for modifying empiric treatment regimens considering the most effec-tive antibiotics. Periodic surveillance in hospital settings to monitor changes in pathogens, and antibiotic resistance patterns is crucial in order to implement optimal prevention and treatment strategies.

Epidemiology of Sepsis Among Children and Neonates in Germany: Results From an Observational Study Based on Nationwide Diagnosis-Related Groups Data Between 2010 and 2016

Born S, Dame C, Matthaus-Kramer C, et al

Critical care medicine. 23. 2021

Worldwide, more than half of all sepsis cases occur in pediatric and adolescent patients, particularly in neonates. Previous population-based studies in these age groups often were limited to either neonatal or pediatric patients admitted to ICUs. We aimed to investigate the overall and age-specific incidence and case fatality of sepsis in children in Germany, a high-income country with a total population of 82 million. Sepsis is also in Germany a common and frequently fatal condition in pediatric patients, particularly among neonates and children with comorbidities.

Sepsis profile and outcome of preterm neonates admitted to neonatal intensive care unit of Cairo University Hospital

Salama K, Gad A and El Tatawy S

Egyptian Pediatric Association Gazette. 691. 2021

This study demonstrates the experience of the neonatal intensive care unit (NICU) of a tertiary referral center in Egypt in management of prematures with neonatal sepsis. This retrospective study included preterm neonates admitted to NICU with clinical and/or laboratory diagnosis of sepsis. Neonatal sepsis was encountered in 21.5% of admitted preterm neonates; LOS was more common (58.8%). Mortality was 51.6%. Klebsiella MDR and CoNS were the most commonly encountered organisms in both EOS and LOS. The isolated families were 100% resistant to ampicillin. The hematological scoring system (HSS) showed limited sensitivity for detection of sepsis. Copyright © 2021, The Author(s).

A decade of neonatal sepsis caused by gram-negative bacilli-a retrospective matched cohort study

Nordberg V, Iversen A, Tidell A, et al

European Journal of Clinical Microbiology and Infectious Diseases. 2021

This study is to determine the incidence and outcome of neonatal gram-negative bacilli (GNB) sepsis in Stockholm, Sweden, and describe bacterial characteristics. The incidence of both GNB-EOS and GNB-LOS was lower than previously reported from comparable high-income settings. The occurrence of antibiotic resistance was low.

The burden of neonatal sepsis and its association with antenatal urinary tract infection and intra-partum fever among admitted neonates in Ethiopia: A systematic review and meta-analysis

Bayih WA, Ayalew MY, Chanie ES, et al

Heliyon. 72: e06121. 2021

More than one-third of the neonatal death in Ethiopia has been attributed to neonatal sepsis. However, there is no recent national evidence about the burden of neonatal sepsis and its association with antenatal urinary tract infection and intra-partum fever, which are commonly reported maternal morbidities in Ethiopia. Therefore, the aim of this systematic review and meta-analysis was to assess the pooled burden of neonatal sepsis and its association with antenatal urinary tract infection as well as intra-partum fever in the country. Neonatal sepsis has remained a problem of public health importance in Ethiopia. Both antenatal

urinary tract infection and intra-partum fever were positively associated with neonatal sepsis. Therefore, preventing maternal urinary tract infection during pregnancy and optimizing the intra-partum care are recommended to mitigate the burden of neonatal sepsis in Ethiopia.

The diagnostic value of serum amyloid A in early-onset neonatal sepsis in premature infants

Dorum BA, Ozkan H, Cakir SC, et al

Hong Kong Journal of Paediatrics. 261: 8-13. 2021

In this study, the aim was to determine the distinct effectiveness of serum amyloid A in the early stage of early-onset neonatal sepsis in premature infants. Serum amyloid A is a reliable diagnostic marker for the early onset of neonatal sepsis, and it has a higher sensitivity at symptom onset or in the first hours after birth in premature infants.

Early-onset sepsis risk calculator: a review of its effectiveness and comparative study with our evidence-based local guidelines

Laccetta G, Ciantelli M, Tuoni C, et al

Italian Journal of Pediatrics. 471. 2021

According to most early-onset sepsis (EOS) management guidelines, approximately 10% of the total neonatal population are exposed to antibiotics in the first postnatal days with subsequent increase of neonatal and pediatric comorbidities. A review of literature demonstrates the effectiveness of EOS calculator in reducing antibiotic overtreatment and NICU admission among neonates >=34 weeks' gestational age (GA); however, some missed cases of culture-positive EOS have also been described. Our evidence-based protocol entails a further decrease of antibiotic overtreatment compared to EOS calculator. No negative consequences for patients were observed.

Mean platelet volume and neonatal sepsis: a systematic review and meta-analysis of diagnostic accuracy

Milas GP, Karageorgiou V and Bellos I 2021

J Matern Fetal Neonatal Med. Epub ahead of print 2021/02/06. 2021

We determine the diagnostic accuracy of Mean Platelet Volume in neonatal sepsis. MPV appears to have a fair diagnostic accuracy in sepsis investigation. Given its ready availability it may constitute an attractive adjunct for clinicians, especially in low-resource environments.

Diagnostic accuracy of clinical tool 'STOPS' and serum procalcitonin for optimizing antibiotic therapy in neonates born at >= 28 weeks of gestation with neonatal sepsis

James J, Tewari VV and Jain N

Mediterranean Journal of Hematology and Infectious Diseases. 131. 2021

Background: Antibiotic therapy is initiated in neonates on suspicion of sepsis. Optimizing therapy is a felt need of clinicians as prolonged injudicious use increases mortality and morbidity risk. We evaluate the diagnostic accuracy of clinical tool 'STOPS' and serum procalcitonin (PCT) for identifying neonates with early-onset neonatal sepsis (EONS) or late-onset neonatal sepsis (LONS) and early discontinuation in those with no sepsis. Identifying abnormal STOPS parameters was superior to PCT alone in EONS and as good as PCT in LONS. The 'STOPS' tool allows early identification of neonates with no sepsis, thereby optimizing antibiotic use.

Pediatric Severe Sepsis and Shock in Three Asian Countries: A Retrospective Study of Outcomes in Nine PICUs

Samransamruajkit R, Wong JJM, Smathakane C, et al

Pediatric critical care medicine : a journal of the Society of Critical Care Medicine and the World Federation of Pediatric Intensive and Critical Care Societies. 1. 2021

Pediatric sepsis remains a major health problem and is a leading cause of death and long-term disability worldwide. This study aims to characterize epidemiologic, therapeutic, and outcome features of pediatric severe sepsis and septic shock in three Asian countries. Mortality from pediatric severe sepsis and septic shock remains high in Asia. Consistent with current guidelines, most of the children admitted to these PICUs received fluid therapy and inotropic support as recommended.

Transcriptome profiles discriminate between Gram-positive and Gram-negative sepsis in preterm neonates

Cernada M, Pinilla-Gonzalez A, Kuligowski J, et al

Pediatric Research. 2021

Background: Genome-wide expression profiles have been previously employed as clinical research diagnostic tools for newborn sepsis. We aimed to determine if transcriptomic profiles could discriminate between

Gram-positive and Gram-negative bacterial sepsis in preterm infants. The transcriptomic profile allowed identification of whether the causative agent was Gram-positive or Gram-negative bacteria. The overexpression of genes such as CD37 and CSK, which control cytokine production and cell survival, could explain the better clinical outcome in sepsis caused by Gram-positive bacteria. Impact: Transcriptomic profiles not only enable an early diagnosis of sepsis in very low birth weight infants but also discriminate between Gram-positive and Gram-negative bacteria as causative agents.T he overexpression of some genes related to cytokine production and cell survival could explain the better clinical outcome in sepsis caused by Gram-positive bacteria, and could lead us to a future, targeted therapy.

Exposure to intrauterine inflammation and late-onset sepsis in very preterm infants

van Doorn MB, van der Voorn JP, Tanger HL, et al

Pediatric Research. 2021

Late-onset sepsis is an important cause of mortality and morbidity in preterm infants. As these infants rely mostly on their innate immune system to fight off infection, enhancing this immune system by appropriate stimuli may prevent late-onset sepsis. However, it remains unclear which stimuli can enhance the neonatal immune system. This study aims to investigate the influence of intrauterine inflammation on late-onset sepsis. Late-onset sepsis in very preterm infants seems not to be associated with intrauterine inflammation. Impact: Intrauterine inflammation is not protective of developing late-onset sepsis in premature infants. A large cohort study on the effect of intrauterine inflammation on neonatal outcome. This study adds to existing knowledge on finding appropriate stimuli to enhance the immune system of premature infants to improve neonatal outcome.

COVID-19 and sepsis top

High D dimers and low global fibrinolysis coexist in COVID19 patients: what is going on in there

Ibañez C, Perdomo J, Calvo A, et al

J Thromb Thrombolysis. 512: 308-312. 2021

COVID-19 coagulopathy linked to increased D-dimer levels has been associated with high mortality. While D-dimer is accepted as a disseminated intravascular coagulation marker, rotational thromboelastometry (ROTEM) also detects fibrinolysis. We describe the ROTEM profile in severely ill COVID-19 patients and compare it with the standard laboratory coagulation test. In COVID-19 patients, the ROTEM pattern was characterized by a hypercoagulable state with decreased fibrinolytic capacity despite a paradoxical increase in D-dimer levels. We suggest that, in COVID-19 patients, the lungs could be the main source of D-dimer, while a systemic hypofibrinolytic state coexists. This hypothesis should be confirmed by future studies.