

September 20th, 2023 09:00 - 11:00

4i E-POSTER (STATION 3)

## ID 1047. SUCCESSFUL USE OF CEFIDEROCOL TO TREAT MULTIDRUG-RESISTANT STENOTROPHOMONAS MALTOPHILIA VENTILATORY-ASSOCIATED PNEUMONIA IN AN EXTREMELY PRETERM NEONATE

Doctor Ulrike Brandenburg<sup>1</sup>, Doctor Archana Koirala<sup>2,3,4</sup>, Doctor Bharath Krishnappa<sup>1</sup>, Doctor Caroline Banh<sup>2,5</sup>, Doctor Michael Findlay<sup>2,5</sup>, Doctor Phoebe Williams<sup>3,4,6</sup>

<sup>1</sup>Neonatal Intensive Care Unit Nepean Hospital, <sup>2</sup>Department of Infectious Diseases Nepean Hospital, <sup>3</sup>National Centre for Immunisation Research and Surveillance, <sup>4</sup>Faculty of Medicine and Health University of Sydney, <sup>5</sup>New South Wales Pathology, <sup>6</sup>Department of Infectious Diseases Sydney Children's Hospital

Background: Ventilator associated pneumonia (VAP), a complication of invasive mechanical ventilation, carries significant morbidity and mortality risks in preterm neonates with underlying Bronchopulmonary Dysplasia. Cefiderocol, a novel 5th generation cephalosporin, has broad gram-negative antimicrobial activity and central nervous system penetration, and is licensed for the treatment of hospital-acquired or ventilator-associated pneumonia in adults. However, there are scarce data pertaining to its use in children, and no published data to date regarding its use in neonates.

Case report: A preterm baby born at 26+6/40 (birth weight 822g) with initially only mild Respiratory Distress Syndrome (RDS) became critically unwell after 14 days with VAP following an episode of clinical abdominal sepsis treated empirically with meropenem. Heavy growth of *Stenotrophomonas maltophilia* was cultured from the endotracheal tube (ETT) aspirate and clinical deterioration occurred despite empirical antimicrobial therapy against VAP and commencement of dexamethasone. After multidisciplinary neonatal infectious disease meeting, cefiderocol monotherapy (30 mg/kg/dose tds (3x/day), administered over one hour infusion) was commenced. Within 72 hours of commencing cefiderocol, the baby was successfully extubated to CPAP and FiO<sub>2</sub> requirements rapidly weaned over subsequent days. Antimicrobial susceptibility testing of the *S. maltophilia* isolate revealed multidrug-resistance (MDR), yet there was susceptibility to cefiderocol.

Conclusion: As per our knowledge, this is the first reported use of cefiderocol, a promising novel 5th generation cephalosporin, in a preterm neonate. It remains unregistered for use in children and neonates despite calls to streamline its development for children with MDR infections.

- Option of cefiderocol treatment was discussed and decided within multidisciplinary neonatal infectious disease meeting
- Dosing data were obtained from conference proceedings and expert consensus, due to the paucity of available published evidence to support cefiderocol use in children or neonates.
- No immediate adverse safety consequences were evident following treatment in a premature neonate

## ID 20. Clinical and Laboratory Findings of Nosocomial Sepsis in Extremely Low Birth Weight Infants According to Causative Organisms

Professor Shin Yun Byun<sup>1</sup>, Professor Kyung Hee Park<sup>1</sup>

<sup>1</sup>Pusan National University Yangsan Hospital, Pusan National University School of Medicine

**Background:** nosocomial sepsis remains a significant source of morbidity and mortality in extremely low birth weight (ELBW) infants. Early and accurate diagnosis is very important, but it is difficult due to the similarities in clinical manifestation between the causative microorganisms. We tried to identify the differences between causative microorganisms in clinical and laboratory findings and to help choose antibiotics, when sepsis was suspected in ELBW infants.

**Methods:** a retrospective study was conducted on preterm infants, born at less than 28 weeks of gestation, with a birth weight of less than 1000 g between January 2009 and December 2019. Clinical and laboratory findings of suspected sepsis, after the first 72 h of life, were assessed. We classified them into four groups according to blood culture results (gram positive, gram negative, fungal, and negative culture groups) and compared them.

**Results:** a total of 158 patients were included after using the exclusion criteria, with 45 (29%) in the gram positive group, 35 (22 %) in the gram negative group, 27 (17 %) in the fungal group, and 51 (32 %) in the negative culture group. There were no significant differences in mean gestational age, birth weight, and neonatal morbidities, except for the age of onset, which was earlier in the fungal group than other groups. White blood cell (WBC) counts were the highest in the gram negative group and the lowest in the fungal group. The mean platelet counts were the lowest in the fungal group. C-reactive protein (CRP) levels were the highest in the gram negative group, while glucose was the highest in the fungal group.

**Conclusions:** in conclusion, we showed that there are some differences in laboratory findings, according to causative microorganisms in the nosocomial sepsis of ELBW infants. Increased WBC and CRP were associated with gram negative infection, while decreased platelet and glucose level were associated with fungal infection. These data may be helpful for choosing empirical antibiotics when sepsis is suspected.

## ID 74. Multisystem Inflammatory Syndrome associated with SARS CoV 2 Infection – Case presentation

Doctor Sonia Tanasescu<sup>1</sup>, Doctor Ionela Tamasan<sup>1</sup>, Doctor Rusu Catinca<sup>1</sup>, Doctor Andreea Homescu<sup>1</sup>, Doctor Carmen Bud<sup>1</sup>, Professor Liviu Pop<sup>1</sup>

<sup>1</sup>Victor Babeş” University of Medicine and Pharmacy Timișoara

### Introduction:

Multisystem inflammatory syndrome in children (MIS-C) is a severe complication that occurs following infection with the SARS-CoV-2 virus. It is relatively rare and is associated with an increased mortality rate. The onset symptoms in MIS-C are persistent fever, the presence of laboratory markers of inflammation and dysfunction of one or more organs. There are no specific diagnostic tests for MIS-C. The diagnosis is based on clinical, laboratory and epidemiological criteria, taking into account that the complete clinical picture may develop within a few days.

### Materials and Methods:

The authors present the case of a 2-month-old male infant who, 2 weeks after SARS-CoV-2 infection, who arrived at the Pediatrics Clinic with fever onset for 3 days. The patient's condition deteriorated rapidly, with fever that was difficult to control with antipyretics (temperature = 40.1oC), decreased appetite, vomiting, bloated abdomen, intense abdominal pain, diarrhea (7-12 stools/day). Clinical investigations revealed anemia (Hb = 9 mg/dL), leukocytosis (13,500/mm<sup>3</sup>) with neutrophilia, highly elevated inflammatory markers (IL-6 = 1460 pg/mL, PCR = 264 mg/L, Procalcitonin = 11.5 ng/mL), increased D-dimers and ferritin, Astrup: pH = 7.26, Excess bases = -18. All cultures collected (blood culture, urine culture, nasal exudate, pharyngeal exudate and stool culture) were sterile. Diarrhea caused by Adenovirus, Norovirus and Rotavirus was also ruled out. Treatment with third-generation cephalosporin, corticosteroids, albumin, immunoglobulins and hydroelectrolytic re-equilibration was initiated, with a slow but favorable evolution.

### Conclusions:

Multisystem inflammatory syndrome is a rare but severe complication of SARS-CoV-2 infection in pediatric patients. Early detection and initiation of therapy are essential for the patient to have the best chances of recovery.

Keywords: MIS-C, SARS-CoV-2, inflammatory markers, infant



## ID 523. NEONATAL SEPTIC ARTHRITIS - CASE PRESENTATION

Doctor Sonia Tanasescu<sup>1</sup>, Doctor Ionela Tamasan<sup>1</sup>, Doctor Carmen Bud<sup>1</sup>, Doctor Andreea Homescu<sup>1</sup>, Professor Liviu Pop<sup>1</sup>

<sup>1</sup>. “Victor Babeş” University of Medicine and Pharmacy Timișoara

Neonatal septic arthritis is defined as an inflammation of the synovial membrane with purulent effusion in the joint capsule secondary to bacterial or fungal infection. The incidence of the disease is approximately 0.3 per 1000 births. Staphylococcus aureus is the most common pathogen causing septic arthritis and is encountered across all age groups.

Due to reduced signs and symptoms, the diagnosis of neonatal septic arthritis is delayed, resulting in significant sequelae, even death.

Material and methods:

The authors present the case of a 22-day-old newborn who presents to the Pediatric Clinic II with a fever of 39-39.9°C, generalized cyanosis and psychomotor agitation. On physical examination: tachycardia of 190 beats/min, temperature of 39.2 °C, pustular lesions on the face, a fluctuating formation on the dorsal surface of the right hand, edema, induration of the right thigh and limited movement of the right lower limb are detected.

Clinical investigations reveal leukocytosis of 30,000/mm<sup>3</sup> with neutrophilia, significantly increased inflammatory markers (CRP=250mg/l, Procalcitonin=12ng/ml) and the presence of Staphylococcus aureus in blood culture and joint fluid.

Antibiotic treatment is initiated and after 4 days from the onset, arthrotomy and debridement were performed in the Pediatric Surgery Clinic, followed by immobilization of the hip. The patient's health is gradually improving but it requires repeated arthrotomies.

Conclusions:

Early diagnosis and prompt initiation of medical and surgical treatment, including arthrotomy and drainage, reduce the risk of mortality and long-term complications in neonatal septic arthritis.

Keywords: arthritis, sepsis, newborn



## ID 28. The association between early-onset infections and cognitive function based on school performance: a nationwide register-based study

Mr Mads Andersen<sup>1</sup>, Doctor Niels Bjerregård Matthiesen<sup>1</sup>, Doctor May Murra<sup>2</sup>, Doctor Stine Yde Nielsen<sup>3</sup>, Professor Tine Brink Henriksen<sup>1</sup>

<sup>1</sup>Department of Pediatrics and Adolescent Medicine, Aarhus University Hospital, <sup>2</sup>Department of Clinical Microbiology, Aarhus University Hospital, <sup>3</sup>Department of Clinical Microbiology, Vejle Hospital

### Background

Neonatal infections are associated with early morbidity and mortality, while the association with long-term outcomes remains uncertain. The aim of this study was to investigate the association between early-onset infections and cognitive function based on school performance in reading and mathematics.

### Methods

All children born between 1997-2009 in Denmark after 34 completed weeks of gestation were identified in the Danish Medical Birth Register. Diagnoses of early-onset infections were defined as ICD10 codes of sepsis or meningitis within the first six days of life leading to at least five days of admission. Proven infections were defined as findings of pathogenic bacteria in blood or cerebrospinal fluid. School performance was assessed by standardized test scores in reading and mathematics conducted in public schools for children 9 to 15 years of age. Multivariable linear mixed models were used to estimate mean differences in test scores between children with and without infection with adjustment for several child, maternal, and socioeconomic factors. Missing values were handled by multiple imputation. Several sensitivity analyses were conducted including sibling-analyses.

### Results

A total of 766,480 children were included with 2,362,046 test scores. A total of 6,328 children had a sepsis-diagnosis, while 84 children had a meningitis-diagnosis. Test scores in reading and mathematics across all ages were lower in children with a sepsis-diagnosis compared with the reference group with results of -0.07 SD (95% CI -0.10 to -0.05) and -0.08 SD (95% CI -0.11 to -0.05). The results were similar when children with a sepsis-diagnosis were compared with siblings without sepsis. The difference in reading and mathematics between children with and without a meningitis-diagnosis was -0.18 SD (95% CI -0.40 to 0.04) and -0.24 SD (95% CI -0.47 to -0.02). Too few children with meningitis were included for sibling-analyses.

### Conclusion

The diagnosis of early-onset sepsis was associated with small decreases in test scores in reading and mathematics, while the diagnosis of early-onset meningitis was associated with more substantial reductions. These differences may be important on a public health level. The association between proven infection and school performance will be presented at the congress.

## ID 337. Can postnatal CMV infection in VLBW be prevented by freezing thawing of mother's milk?

Doctor Pavel Kopecký<sup>1</sup>, Doctor Markéta Lukšová<sup>1</sup>

<sup>1</sup>General Faculty Hospital Prague

**Background:** Postnatal CMV infection caused by transmission of virus from milk of seropositive mother may cause symptomatic disease in preterm infant. Freezing-thawing reduces the amount of virus in the milk.

**Methods:** In the single center during 3 years study period we tested mothers of delivery room VLBW survivors for CMV seropositivity. In the first 2 years mothers giving birth to <26 weeks GA infants were enrolled, in the last year the limit was <28 weeks GA. If positive their milk was freeze-thawed for at least 72 hours until 32 weeks GA. Urine of all neonates born to seropositive mothers was tested for CMV positivity on 21th day and again between 32 and 35 weeks GA. Infants were diagnosed as symptomatic if their urine and blood was CMV positive and they developed clinical and laboratory signs attributable to CMV infection. Historical control 6 years period (all <28 g.w. liveborn between 2013-2018) total 331 infants were used for the efficacy assessment of prevention of symptomatic CMV disease.

**Results:** 61% tested mothers were seropositive. Symptomatic disease was diagnosed in 4 of 93 (4,3%) infants born <26. weeks GA study group vs 12 of 171 (7%) control. 2 of 4 CMV infections were antenatally or perinatally acquired as their 21th day urine and 3rd day dry drop blood were CMV positive. Other 4 (4,3%) of 93 in the study group were CMV urine late positive but asymptomatic. In 26+0 to 27+6 weeks GA study group 1 (2%) of 50 developed symptomatic disease vs 3 (1,9%) of 160 controls. Asymptomatic study CMV urine late positivity was 5 (10%) of 50 in 26+0 to 27+6 weeks GA study group.

**Conclusion:** In VLBW born between 26+0 to 27+6 weeks GA symptomatic CMV infection was rare and freeze-thawed milk didn't prevent it: 2% study vs 1,9% control. There was not significant reduction in <26 weeks GA study group 4,3% vs 7% control. <26 weeks GA CMV infection was more likely to be symptomatic 4 (50%) of 8 CMV positive infants vs 1 (17%) of 6 CMV positive infants in 26+0 to 27+6 weeks GA study group.

	study	control	p
clinical CMV <26	4/93 (4,3%)	12/171 (7%)	0,404
clinical CMV 26-27	1/50 (2%)	3/160 (1,9%)	0,956
asymtomatic CMV <26	4/93 (4,3%)		
asymtomatic CMV 26-27	5/50 (10%)		
total CMV <26	8/93 (8,6%)		
total CMV 26-27	6/50 (12%)		

**Table 1:** CMV incidence in VLBW



## ID 866. GRAM-NEGATIVE NEONATAL SEPSIS IN A MALE WITH HIRSCHSPRUNG DISEASE: A CASE REPORT

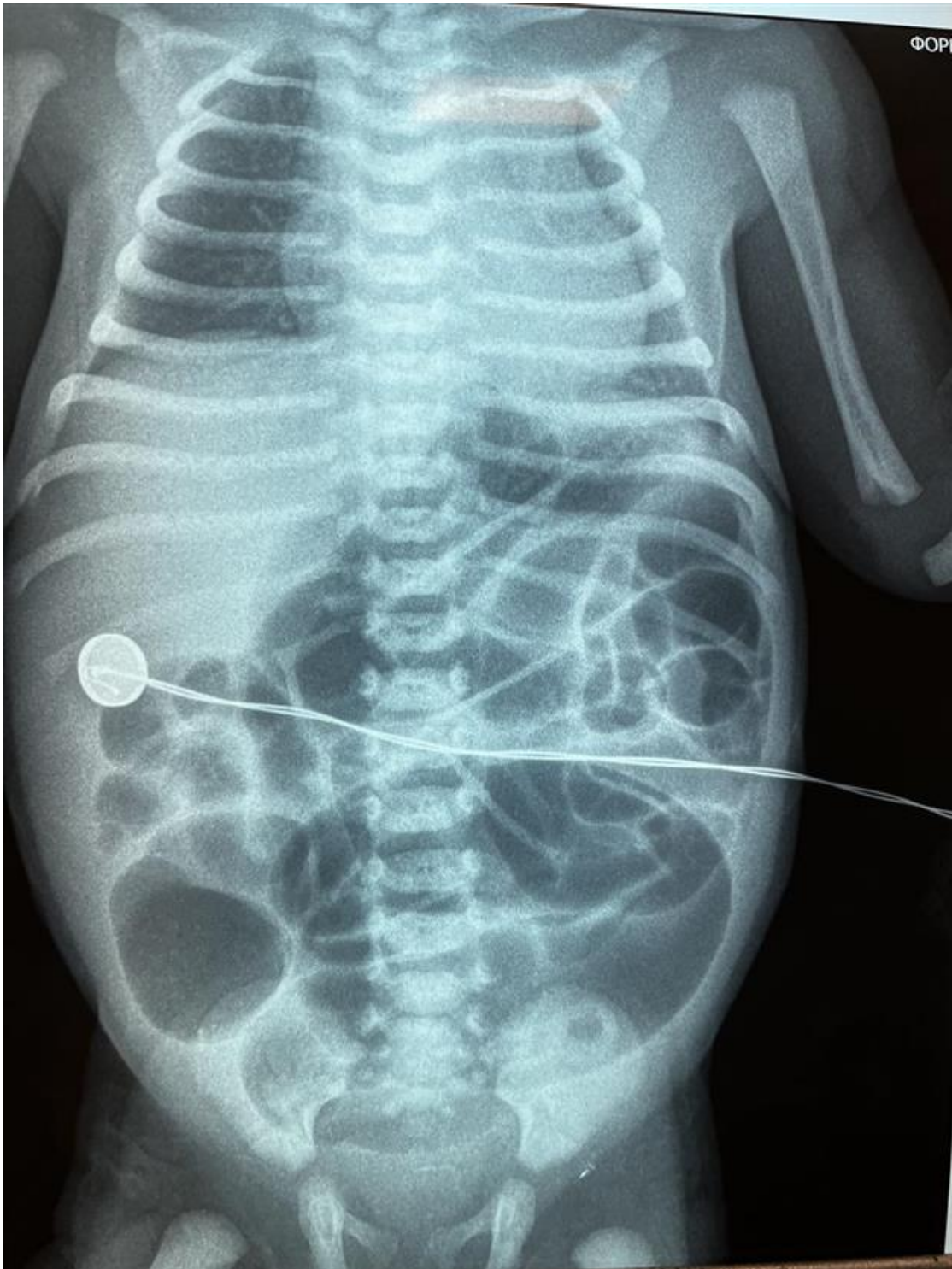
Doctor Filippos Filippatos<sup>1</sup>, Mrs Konstantina Leontari<sup>1</sup>, Mrs Saanta Chatziali<sup>1</sup>, Mrs Theodora Kyriakidou<sup>1</sup>, Mrs Ioanna-Maria Konstantinidou<sup>1</sup>, Mrs Vasiliki Daniil<sup>1</sup>, Doctor Rozeta Sokou<sup>1</sup>, Associate Professor Theodora Boutsikou<sup>1</sup>, Professor Nicoletta Iacovidou<sup>1</sup>, Assistant Professor Zoi Iliodromiti<sup>1</sup>

<sup>1</sup>Neonatology Department, Aretaieio Hospital, National and Kapodistrian University of Athens, Athens, Greece

**Background:** Hirschsprung disease (HD) is a rare motor gastrointestinal disorder of neonatal period which occurs due to defective migration and differentiation of neuroblasts from the neural crest to the colon during fetal life. Stasis and bacterial overgrowth are possible predisposing factors for bacterial translocation and neonatal sepsis. We report a case of a male neonate with HD and confirmed Gram-negative sepsis.

**Case report:** We report a case of a male neonate born from 31-year-old mother at 39+3 weeks of gestation by vaginal birth (birth weight: 3660 gr). Maternal medical history and pregnancy history were normal, except for a Doppler ultrasonography in 35+5 weeks of gestation which revealed polyhydramnios (AFI: 21.4 cm). In 2017, the mother gave birth to a 4200 gr-male also with polyhydramnios at pregnancy. Approximately 7 hours after birth, the neonate had poor feeding, lethargy and failure to pass meconium. Clinical evaluation revealed decreased bowel sounds and significant abdominal distension which was also confirmed by abdominal radiograph. Laboratory findings revealed WBC: 10450/ $\mu$ L (Neutrophils: 56.9%) and CRP: 2.18 mg/L, blood and CNS cultures were obtained and empiric antibiotic therapy with ampicillin, amikacin and metronidazole was initiated. During the 2nd day of life, laboratory findings were CRP: 90.8 mg/L and PCT: 21.42 pg/L and blood cultures were positive for E. Coli, confirming early-onset sepsis. Intravenous antibiotic therapy of was escalated to meropenem and amikacin which the neonate received for 10 days. Abdominal distention was decompressed with N/S 0.9% rectal administration. At 6th day of life, the neonate underwent Swenson surgical procedure and suction sigmoid biopsy under general anesthesia which confirmed the diagnosis of HD (absence of ganglion cells). Supportive biopsy findings were the presence of hypertrophic nerve fibers and absence of calretinin-immunoreactive fibers in the lamina propria.

**Conclusion:** Failure to recognize HD in the early perinatal period or after surgical intervention increases the risk for HD enterocolitis or even neonatal sepsis. Further research is needed in order underlying pathophysiological mechanisms of neonatal sepsis in HD to be fully elucidated.



Abdominal radiograph suggesting signs of distal intestinal obstruction and dilated bowel loops proximal to the aganglionic region without evident transition zone.



## ID 55. INVASIVE FUNGAL INFECTIONS IN NEONATOLOGY

Professor Sabina Terzic<sup>1</sup>, Alma Zgalj<sup>2</sup>, Doctor Amila Sidran<sup>1</sup>, Professor Hajrija Maksic<sup>1</sup>

<sup>1</sup>Nicu, Pediatric Clinic, Ccu Sarajevo, <sup>2</sup>Medical faculty, University of Sarajevo

**Objectives:** The aim of this study was to show the epidemiological and clinical characteristic of invasive fungal infections (IFI) in newborns, type of pathogens, risk factors, laboratory parameters and the therapeutic approach to infection.

**Patients and methods:** This is a retrospective, descriptive analysis of medical records of patients hospitalized in the Neonatal Intensive Care Unit of Pediatric Clinic of the Clinical Center University of Sarajevo in the period of three years (1st Jan 2020 to 31st Dec 2022), who were diagnosed with IFI. The study included 22 patients. Patients were divided into two groups with regard to the type of pathogen and statistically compared with regard to the risk factors and the outcome.

**Results:** Out of 1922 admissions there were 22 neonates with IFI, with an overall incidence rate of 11.5 per 1000 admissions per year. *Candida albicans* was the most frequently isolated species (54.5%). The main risk factors for IFI in the NICU were: prolonged use of broad-spectrum antibiotics, parenteral nutrition, central lines, mechanical ventilation, birth weight <1500g and prematurity. There was no significant difference in risk factors for infection with *Candida albicans* and non-*albicans Candida*, except for MV, which was more frequently used in *C. albicans* patients. There was significant rise of the median CRP and a significant drop of the median platelet count during infection. Fluconazole was the most common antifungal used in the NICU. The overall mortality rate was 27.3% with significantly higher mortality in patients with *C. albicans* compared to other *Candida* species.

**Conclusion:** The mortality rate was significantly higher in patients infected with *C. albicans* than with non-*albicans* species. Future studies should focus on the validation of *Candida* score and determination of preventive interventions for IFI in NICU patients.

**Keywords:** invasive fungal infection; candidiasis, neonate

## ID 731. BABIES WHO STEW, MAY HAVE HSV-2: WHEN TO CONSIDER HSV-2 IN NEONATES AND WHAT DOES THE EVIDENCE SUGGEST?

Doctor Spandana Rupa Madabhushi<sup>1</sup>, DR ATHER AHMED

<sup>1</sup>LISTER HOSPITAL, EAST AND NORTH HERTFORDSHIRE TRUST

Herpes Simplex Viral Infections, whilst rare, are an important differential to consider in neonates with suspected sepsis who fail to respond to 48-72hrs of intravenous antibiotics(1). The most common mode of transmission is during delivery, contributing to 86% of cases. However, between 60-80% mothers have no evidence of genital HSV infection at delivery, no past history of genital lesions nor an affected partner(2, 3).

A baby boy born at 40+5 weeks by forceps delivery was admitted to the intensive care unit for non-invasive respiratory support and cerebral function monitoring (CFM) in view of respiratory distress and borderline cord gases. Pregnancy was uneventful with normal scans and protective serology. He was started on first line antibiotics, and as his neurological examination remained normal over 12 hours, monitoring was discontinued. A Lumbar Puncture was performed on day 2 due to rising CRP. On day 4 of life he began to spike persistent temperatures, so a repeat septic screen was sent along with HSV PCR. He was found to be HSV-2 positive on blood PCR, although CSF PCR was negative. The mother was tested postnatally, and was HSV-2 IgG positive, but denied any history of genital lesions. He continued on intravenous aciclovir for a total of 3 weeks, with a negative blood PCR at the end of the course. He had normal neurodevelopment, having been followed up at 6 weeks and again at 3, 6 and 12 months.

The literature acknowledges the challenges of classifying HSV infections, however this is how treatment duration and follow up is determined. Whilst sensitive and specific, a negative CSF PCR does not exclude CNS disease. In light of this, perhaps an empiric treatment duration of 21 days is safer to prevent neurodevelopmental sequelae. Using the same reasoning, consideration should be given to commencement of oral aciclovir prophylaxis and diffusion weighted MRI.

There is clear guidance on managing infants born to mothers with known HSV, and we suggest a standardised approach be taken with infants when HSV is detected postnatally. This should include a minimum treatment duration of 3 weeks, oral aciclovir prophylaxis and a diffusion weighted MRI.

## ID 933. SEPSIS IN VERY PRETERM NEONATES: A MAJOR RISK FACTOR FOR DEVELOPMENT OF BPD

Doctor A Konstantinidi<sup>2</sup>, Doctor S Parastatidou<sup>2</sup>, Doctor Eleni Karapati<sup>1</sup>, Doctor K Lampropoulou<sup>2</sup>, Doctor G Ioakeimidis<sup>2</sup>, Doctor E Tavoulari<sup>2</sup>, Doctor K Mitropoulos<sup>2</sup>, Doctor M Lampridou<sup>2</sup>, Doctor R Sokou<sup>2</sup>

<sup>1</sup>Neonatal Department, Medical School, National and Kapodistrian University of Athens, Aretaieio Hospital, 11528 Athens, <sup>2</sup>NICU, Nikaia General Hospital "Aghios Panteleimon", Piraeus, Greece

**Background.** BPD is the most common chronic lung disease of very preterm neonates. Although its pathogenesis has not been fully elucidated, inflammatory response appears to play a crucial role. Preterm neonates, especially those with gestational age (GA) <32 weeks, are susceptible to infections due to the immaturity of the immune system and the skin barrier as well as the multiple interventional procedures they undergo during their hospitalization in Neonatal Intensive Care Units (NICUs). There is evidence that sepsis in very preterm neonates induces a pro-inflammatory response and deposition of fibrin in the immature lung, predisposing them to the development of BPD. The study aimed at investigating the impact of neonatal sepsis in the incidence and severity of BPD.

**Methods.** Seventy neonates, hospitalized in our NICU, with GA<32 weeks, were included in this retrospective study. Antenatal corticosteroid administration, type and duration of respiratory support, caffeine administration, incidence of sepsis and BPD were recorded for all study neonates. Chi-square test, Pearson correlation coefficient and multiple regression analysis were used for statistical analysis.

**Results.** Sepsis increased the risk of developing BPD by 9.67 times (95% C.I. 2,85-32,82) and was positively and significantly correlated with disease severity ( $\rho$  0.479,  $p=0.000$ ). Antenatal corticosteroids and caffeine administration did not constitute confounding factors.

**Conclusions.** Sepsis is an additional risk factor for the incidence and outcome of BPD in very preterm neonates. Efforts to decrease BPD morbidity should include prevention and appropriate management of sepsis in this population.



## ID 91. CIRCULATING YKL-40 AS A POTENTIAL BIOMARKER FOR SEPSIS IN TERM NEONATES – A PILOT STUDY

Dr Evangelia Steletou<sup>1</sup>, Dimitra Metallinou<sup>2</sup>, Dr Alexandra Margeli<sup>3</sup>, Professor Athanasios Michos<sup>4</sup>, Dr Ioannis Papassotiriou<sup>3</sup>, Professor Tania Siahaidou<sup>4</sup>

<sup>1</sup>Master of Science Program “Pediatric Infectious Diseases”, School of Medicine, National and Kapodistrian University of Athens, <sup>2</sup>Department of Midwifery, University of West Attica, <sup>3</sup>Department of Clinical Biochemistry, “Aghia Sophia” Children’s Hospital, <sup>4</sup>Neonatal Unit of the First Department of Pediatrics, School of Medicine, National and Kapodistrian University of Athens

**Introduction.** The burden of neonatal sepsis highlights the need for its clear and prompt diagnosis to avoid the overuse of antibiotics and prevent severe complications. So far, none of the existing biomarkers of neonatal sepsis is considered to be ideal. Thus, the investigation of new biomarkers of neonatal sepsis is rational. YKL-40, also known as Chitinase-3-like protein 1 (CHI3L1) or glycoprotein-39, is mainly expressed by neutrophils and activated macrophages and has critical roles in protecting against infectious agents, antigen- and oxidant-induced injury responses and inflammation. It is a promising diagnostic biomarker of sepsis in adults; however, its value in neonatal sepsis is not known. The aim of this study was to evaluate the circulating levels and diagnostic value of serum YKL-40 in term neonates with sepsis.

**Methods.** In this pilot case-control study, 45 term neonates (30 septic and 15 non-septic, as controls), 4 to 28 days old, were prospectively studied. The International Pediatric Sepsis Consensus Conference criteria were applied to diagnose sepsis. During the acute phase (admission) and remission of sepsis blood samples were collected from cases, while from controls only once, for routine laboratory tests, cultures, and measurement of serum YKL-40 levels by Elisa.

**Results.** In the acute phase of sepsis, YKL-40 levels were significantly elevated in comparison with remission ( $p=0.004$ ) and controls ( $p=0.003$ ). YKL-40 levels did not differ significantly between patients in remission and controls ( $p=0.431$ ). At admission, YKL-40 levels correlated positively with white blood count, absolute neutrophil count and CRP levels. By ROC analysis it was shown that YKL-40 levels at admission were a significant indicator of sepsis (AUC=0.771, 95% CI 0.632-0.911;  $p=0.003$ ).

**Conclusion.** Serum YKL-40 might be considered as a biomarker of sepsis in term neonates. Larger studies are needed to validate the clinical utility of YKL-40 in neonatal medicine.

## ID 109. Hyperleukocytosis in a preterm infant – take notice of the skin

Doctor Philippe Pape<sup>1</sup>, PD Dr. Olaf Beck<sup>2</sup>, Prof. Dr. Eva Mildenberger<sup>1</sup>, Doctor Julia Winter<sup>1</sup>

<sup>1</sup>University Medical Center of the Johannes Gutenberg University Mainz, Children's Hospital, Neonatology, <sup>2</sup>University Medical Center of the Johannes Gutenberg University Mainz, Children's Hospital, Pediatric Hematology/Oncology

Background: Leukocytosis refers to an increase in the total number of white blood cells (WBC) due to various physiologic, infectious, inflammatory or malignant processes and is a frequent finding in preterm infants. Hyperleukocytosis, defined as a total WBC count of  $>100.000/\mu\text{l}$  is a rare diagnostic challenge requiring evaluation of leukaemia, leukocyte adhesion defect and myeloproliferative disorders.

Case Report: A preterm female infant of 28+4 weeks of gestational age was born by cesarean section because of vaginal bleeding and prolaps of the amniotic membrane (Apgar score 5/7/8, pH 7.27). The infant was intubated, received surfactant in the delivery room and was soon extubated to continuous positive pressure ventilation. She was hyperthermic ( $39.3^{\circ}\text{C}$ ) and had leukocytosis ( $78.000/\mu\text{l}$ ) with an elevated ratio of immature leukocytes. C-reactive protein and interleukine 6 were negative. For suspicion of neonatal sepsis, she was treated with intravenous antibiotics. On the 2nd day of life WBC count increased to  $140.000/\mu\text{l}$  and the infant was transferred to our hospital for evaluation of a hematologic disease. The infant was in a good clinical condition and showed multiple small papular lesions periumbilical and on her extremities. Two unimpressive white spots were detected on the remnant of umbilical cord. Due to the typical skin lesions, we suspected a congenital cutaneous candidiasis and started intravenous and topical antifungal therapy. The microbiologic examination of various skin-swabs revealed *Candida albicans*. Blood culture was negative. Workup for hematologic disease was unremarkable and there were no signs of further visceral involvement. Leukocyte count rapidly decreased and the skin lesions resolved. Despite the hyperleukocytosis with elevated uric acid and lactate dehydrogenase the patient did not show any clinical signs of leukostasis or cell lysis.

Conclusion: We want to highlight congenital cutaneous candidiasis as a rare but important cause of hyperleukocytosis in preterm infants. Patient's skin including the umbilical cord should be examined carefully. In our infant, clinical signs were subtle and peripheral smears from the patient mimicked neonatal leukaemia, which delayed the diagnosis and delayed adequate treatment. According to literature, complications of hyperleukocytosis, such as leukostasis and cell lysis, appear to be rare in the preterm infant.



## ID 117. Retrospective analysis of leukemoid reactions in extremely pre-term infants in a tertiary NICU from 2018-2021.

Doctor Ciara Terry<sup>1,2</sup>, Dr. Daniel Kane<sup>3</sup>, Dr. Maeve Eogan<sup>3</sup>, Dr. Emma Doyle<sup>4</sup>, Prof. Naomi McCallion<sup>1,7</sup>, Prof. Richard Drew<sup>2,5,6</sup>

<sup>1</sup>Department of Neonatology, Rotunda Hospital, <sup>2</sup>Clinical Innovation Unit, Rotunda Hospital, <sup>3</sup>Department of Obstetrics and Gynaecology, Rotunda Hospital, <sup>4</sup>Department of Pathology, Rotunda Hospital, <sup>5</sup>Irish Meningitis and Sepsis Reference Laboratory, Children's Health Ireland at Temple Street, <sup>6</sup>Department of Clinical Microbiology, Royal College of Surgeons in Ireland, <sup>7</sup>Department of Paediatrics, Royal College of Surgeons in Ireland

**Background:** Neonatal leukemoid reaction is associated with higher risk of mortality, bronchopulmonary dysplasia and chorioamnionitis.

The aim of our study was to characterise maternal and placental factors associated with neonatal leukemoid reaction and to describe outcomes of these ELBW infants. We aimed to assess if maternal factors could assist the decision-making process regarding delivery of preterm infants at risk of chorioamnionitis and the sequelae of this inflammatory process.

**Methods:** We performed a retrospective case control study in a single, tertiary Maternity Hospital in Dublin. Two matched controls were identified for each case based on gestation and year of birth and data was collected on both the infants and their mothers.

**Results:** 7 extremely preterm neonates were identified as having a leukemoid reaction, defined as a total white cell count of >50,000 in the first seven days of life. Baseline characteristics between the two groups was similar. The median gestational age in the leukemoid group was 24+4 weeks and 24+1 in the control group. The mean birthweight was 650g in the cases group vs. 655g in the control group.

The preterm infants with leukemoid reaction had a longer duration of ventilation with a median of 18days (7.5-23.5 days) compared to 6.5days (2.8-24.5days) in the control group. More infants in the leukemoid reaction group required inotropes for hypotension in the first 72 hours after delivery (42.9% vs 7.1% in the controls, p value 0.169).

Death or BPD occurred in 85.7% of the cases with leukemoid reaction vs 71.4% of the controls.

Median maternal CRP was higher in cases prior to delivery (66 vs 18.1 mg/L, p value = 0.2151).

There was histological evidence of maternal inflammatory response in all cases with fetal inflammatory response in 71% of cases.

**Conclusions:** Leukemoid reaction in ELBW infants with evidence of maternal and fetal inflammatory response syndrome on placental histology is associated with a longer duration of ventilation, increased need for inotropes in the first 72hours after birth, higher rates of death and BPD. Prospective studies are required to identify potential biomarkers such as proinflammatory cytokines, IL-6, which might aid the decision-making process in delivery.



Variable	Cases (n=7)	Controls (n=14)
NEC n(%)	1.000 (14.286%)	2.000 (14.286%)
Death or BPD at 36/40 n(%)	6 (85.714%)	10 (71.429%)
Inotropes in first 72hrs n(%)	3(42.857%)	1 (7.143%)
Death before discharge n(%)	4 (57.143%)	5 (35.714%)
IVH n(%)	5 (83.333%)	9 (64.286%)
PVL n(%)	1 (14.286%)	0 (0%)
Hydrocortisone for hypotension in first 72hrs	2 (28.571%)	0 (0%)
Need for iNo n(%)	4 (57.143%)	4 (28.571%)
HFOV n(%)	4 (57.143%)	6 (42.857%)
RCC transfusion first 72hrs n(%)	5 (71.429%)	4 (28.571%)
No. of days ventilated (median, IQR)	18 (7.500-23.500)	6.5(2.750-24.500)
Pneumothorax n(%)	3 (42.857%)	5 (35.714%)
Doses of Surfactant		
1	4	10
2	2	2
3	1	2
Need for postnatal steroids (DART) n (%)	3 (42.857%)	5 (35.714%)

Table 1. Neonatal Outcomes



## ID 472. IMPACT OF THE COVID-19 OUTBREAK ON TRENDS IN PEDIATRIC EMERGENCY DEPARTMENT UTILIZATION IN NEONATES

Doctor Gulkhanım Ahmadova<sup>1</sup>, Doctor Dilek Kahvecioğlu<sup>1</sup>, Doctor İlknur Fidancı<sup>2</sup>, Doctor Medine Ayşin Taşar<sup>2</sup>

<sup>1</sup>University of Health Sciences Ankara Training and Research Hospital Neonatal Intensive Care Unit , Ankara/Turkey, <sup>2</sup>University of Health Sciences Ankara Training and Research Hospital, Pediatric Emergency Department , Ankara/Turkey

**Background :** During the COVID-19 pandemic, the frequency of admission to the pediatric emergency department has decreased significantly due to the fear of contagion, restriction of circulation, and the decrease in infectious diseases, especially in children, but there is no known research on how newborns' emergency service admissions are affected. In our study, we aimed to determine the changes in the frequency and causes of newborn admissions to a tertiary pediatric emergency service by evaluating the COVID-19 pandemic period and the year before the pandemic.

**Methods:** Newborns aged 0-28 days admitted to the Pediatric Emergency Service were divided into two groups as the period of COVID-19 pandemic (Group 1, n: 318) and the period 1 year before the COVID-19 pandemic (Group 2, n: 806). Demographic characteristics, complaints, physical examination findings, laboratory findings, imaging results, hospitalization and referral rates of the patients in both groups were evaluated.

**Results:** It was seen that, 1.2% of the total admissions in the COVID-19 period and 0.82% of the total admissions in the non-COVID-19 period were newborn admissions. The median age in Group 1 was 6 days (min-max=2-28) and in Group 2 was 9 days (min-max=1-28) ( $p<0.001$ ). The most common reason for admission in both groups was control examination. The most common discharge diagnoses in both groups were neonatal jaundice and normal newborns . The referral rate was 3.8% in Group 1 and 8.7% in Group 2 ( $p=0.004$ ). The rate of leaving the hospital without permission was higher in Group 1 (3.1%) than Group 2 (0.7%) ( $p=0.001$ ).

**Conclusion:** It was determined that the pediatric emergency service admissions of newborns increased proportionally in the COVID-19 period, unlike the pediatric patient group, and their age at admission decreased in this period. In addition, it was observed that the most common reason for admission was control examination. It was thought that this was due to the closure of the neonatal outpatient clinics during the pandemic period and the concerns of the parents. For this reason, we think that more education should be given to parents about which complaints and when to apply to the emergency service.



## ID 502. DEVELOPMENT OF INFANTS OF MOTHERS WHO HAD COVID-19 DURING PREGNANCY UNDER THE AGE OF ONE YEAR AND COMPARISON WITH HEALTHY CONTROLS

Doctor Hazal Eryılmaz<sup>2</sup>, Doctor Rukiye Ünsal Saç<sup>2</sup>, Doctor Ayşe Esra Tapçrı<sup>2</sup>, Doctor Özge Balcı<sup>3</sup>,  
Doctor Dilek Kahveciođlu<sup>1</sup>, Doctor Medine Ayšın Taşar<sup>2</sup>

<sup>1</sup>University of Health Sciences Ankara Training and Research Hospital Neonatal Intensive Care Unit , Ankara/Turkey, <sup>2</sup>University of Health Sciences Ankara Training and Research Hospital, DEpartment of Pediatrics , Ankara/Turkey, <sup>3</sup>University of Health Sciences Ankara Training and Research Hospital, Department of Developmental Pediatrics, Ankara/Turkey

**Background:** Evaluation of infants of mothers who had SARS-CoV-2 during pregnancy by anthropometric measurements and Denver Developmental Screening Test-2 (DDST-2) under one year of age, compare them with controls, to determine the impact of intrauterine SARS-CoV-2 exposure on infant development.

**Methods:** Between July 2020-July 2022, we retrospectively accessed follow-up information of infants aged 0-12 months whose mothers had COVID during pregnancy and who did not have COVID during pregnancy, who were admitted to our Healthy Child Polyclinic. Term, healthy, 40 babies were included. Demographic data, percentile (p) values, DGTT-2 results were analyzed.

**Results:** No gender difference was found in study (n=40, 55% male) and control groups (n=40, 57.5%) (p=0.05). Mean mother age was 28.48±5.74 in study group and 29.18±6.02 years in controls (p>0.05). Mean gestational age was 38.58±1.34 weeks in study group and 38.75±1.06 weeks in controls (p>0.05). Majority of mothers had COVID-19 in third trimester (45%). Head circumferences were below 3rd percentile in first month, in four (16.7%) and two (7.7%) babies, in study and control group (p=0.295). Height percentiles were normal in all infants in both groups. There wasn't difference in weight percentile between two groups (p=0.520). At sixth month, six (22.2%) in study, one (3.6%) baby in control group had head circumference below 3rd percentile (p<0.045). At sixth month, there wasn't difference in length and weight percentile comparison between the groups (p>0.05). Ninth month head circumferences showed no difference between groups in length, and weight percentiles, being within normal limits (p>0.05). Both groups of 39 infants had age-matched neurodevelopment according to DDST-2. One infant was suspicious in study group, one infant had an anomalous result in controls.

**Conclusion:** Information is limited regarding long-term effects of gestational COVID-19 on growth and development of infants. We investigated anthropometric and neurodevelopmental characteristics during the first year in infants of mothers exposed to COVID-19 during pregnancy. No difference was found compared to controls. Further studies are needed to reach concrete data and definite conclusions on this subject.

## ID 183. SUCCESSFULLY TREATED MEDICALLY INVASIVE CANDIDIASIS WITH CARDIAC MASS IN A MICROPREMIE

Professor Filiz Bakar<sup>1</sup>, Assistant Professor Mustafa Berber<sup>1</sup>, Residency Student Ali Zeki Bedir<sup>1</sup>, Residency Student Muzaffer Enes Pehlivan<sup>1</sup>, Residency Student Duygu Yilmaz<sup>1</sup>

<sup>1</sup>Yeditepe University Faculty Of Medicine

Invasive fungal infections are important causes of neonatal mortality and morbidity. Incidence varies from 4% to 16% in extremely low birth weight neonates with the *Candida albicans* species accounting for 60% of cases. Cardiac manifestations in neonates can present as valvular vegetations, perivalvular abscesses, or intracardiac masses. We present a preterm neonate who developed a right atrial fungal mass and was successfully treated with medical therapy.

A male baby weighing 648 g was delivered at 23+6 weeks by spontaneous vaginal route in our hospital. Following delivery, baby was intubated, started mechanical ventilation, administered surfactant and an umbilical venous line inserted. Initial sepsis markers were negative. Prophylactic fluconazole was started. On day 8 vancomycin and cefotaxime was started because of suspected sepsis. Linezolid and meropenem was started after a sudden deterioration on day 13. Chest x ray showed reticulonodular infiltration. Because *Candida albicans* grew on blood culture micofungine was added. After one week of treatment blood culture was again positive for *Candida albicans* and echocardiography revealed a 5 mm X 5 mm mass attached to the right atrium. Fluconazole was added because of the sensitivity of *Candida* species. Serial echocardiography over the next 4 weeks showed similar findings with no change in size of the mass. On day 37 the baby was extubated. After 45 days of antifungal treatment, repeat echocardiography did not show any evidence of the vegetation in the right atrium and blood culture was negative. The medical treatments were stopped. Ultrasonography of brain showed normal findings. Intravitreal anti-VEGF injection was done for retinopathy of prematurity in both eyes. The baby was discharged on day 85 of life.

This is a report of a successfully medically treated micropremie with invasive candidiasis carrying a high mortality rate.

## ID 542. UNIVERSAL SCREENING FOR CONGENITAL CYTOMEGALOVIRUS IN NEWBORNS: IMPACT OF THE COVID-19 PANDEMIC

Miss Melissa Fontalvo Acosta<sup>1</sup>, Miss María Ríos Barnés, Miss Nerea Liñan, Miss María Moreno, Miss Cristina Esteva, Miss Carmen Muñoz-Almagro, Dr Antoni Noguera-Julian, Dra Ana Alarcón  
<sup>1</sup>Hospital Sant Joan De Deu Barcelona

**Introduction:** Congenital cytomegalovirus (cCMV) is the most common congenital infection and can cause sensorineural hearing loss (SNHL) and other neurological disabilities. Universal cCMV screening in newborns could allow early diagnosis and antiviral treatment, as well as early intervention in case of SNHL or other disabilities. **Objectives:** (1) to evaluate the feasibility of universal cCMV screening in newborns and (2) to establish the prevalence of cCMV in a tertiary hospital in Barcelona.

**Methods:** Single-center prospective cohort study. Detection of CMV DNA in saliva was performed by Alethia® loop-mediated isothermal amplification (LAMP) assay in neonates <15 days born or admitted to Hospital Sant Joan de Déu (HSJD, Barcelona) without clinical indication for cCMV investigation and with parental consent. Positive results were confirmed by urine CMV PCR. After a first study period (February/21 to February/22) in which, coinciding with the COVID-19 pandemic and confinement policies, a lower than expected prevalence of cCMV was observed, recruitment was temporarily interrupted; a second study period took place between September/22 and March/23.

**Results:** First period: 2934 newborns were included; 10 had a positive result in saliva, cCMV was confirmed by detection in urine in 1; symptomatic cCMV was diagnosed in another patient (of a total of 157 with clinical indication for cCMV investigation). Second period: 1359 newborns were included; 6 had a positive saliva result, with cCMV confirmed by urine detection in 2; symptomatic cCMV was diagnosed in 3 patients out of 124 with clinical indication for cCMV investigation. cCMV prevalence was 0.06% in the first period and 0.33% in the second period ( $p=0.04$ ). Of the 4596 parents who were offered to participate in the study, 4463 (97.1%) accepted. The mean age of saliva collection was 1.46 days (SD 1.80), and the result was available at a mean age of 3.74 days (SD 1.82).

**Conclusions:** Universal neonatal screening for cCMV by detection in saliva is feasible and widely accepted. Coinciding with prevention measures for SARS-CoV-2 transmission, we observed a low overall prevalence and a difference between both periods. This reinforces the importance of behavioral interventions to reduce the risk of CMV transmission in pregnant women.

## ID 263. SEPSIS 'GOLDEN HOUR' : QUALITY IMPROVEMENT INITIATIVE TO IMPROVE NEONATAL ANTIBIOTIC STEWARDSHIP PRACTICES

Mrs Michelle Scott<sup>1</sup>, Dr Chigozie Okwujiako<sup>1</sup>, Dr Chandran Bai<sup>1</sup>, Mrs Kim Bullock<sup>1</sup>, Ms Kylene Forde<sup>1</sup>, Dr Chloe Guy<sup>1</sup>, Mrs Caroline North<sup>1</sup>, Ms Karen Sidgwick<sup>1</sup>, Mrs Jenny Toon<sup>1</sup>, Dr Puneet Nath<sup>1</sup>, Doctor Sarah Williamson

<sup>1</sup>University Hospitals Coventry And Warwickshire Nhs Trust

**Background:** Neonatal infections, early (within 72 hours of birth) or late-onset (after 72 hours), can lead to life threatening sepsis, a leading cause of morbidity and mortality (NICE, 2021). Prompt initiation of antibiotics can save lives. However, inappropriate antibiotic use can be detrimental. Antibiotics should be commenced within 60 minutes of decision to treat (golden hour). Antibiotic stewardship aims to achieve optimal outcome, minimise drug toxicity, adverse effects, emergence of multi-drug resistant strains and improve cost effective use of health care resources (CDC 2010).

**Methods:** A multi-professional Quality Improvement (QI) group was established across obstetrics and neonatology. The aim being to incrementally increase the number of babies receiving antibiotics within the golden hour and to safely reduce the number of well babies with infection risks, treated with antibiotics.

Plan-Do-Study-Act (PDSA) methodology changes were identified.

CYCLE 1

Education across departments to raise staff awareness.

CYCLE 2

Sepsis trolley to ensure all equipment is in one place to reduce screening time.

CYCLE 3

Alternative baby labelling system practices to decrease administration time.

CYCLE 4

Kaiser Permanente Sepsis Risk Calculator (KPSRC) adopted to safely reduce number of well babies prescribed antibiotics.

CYCLE 5

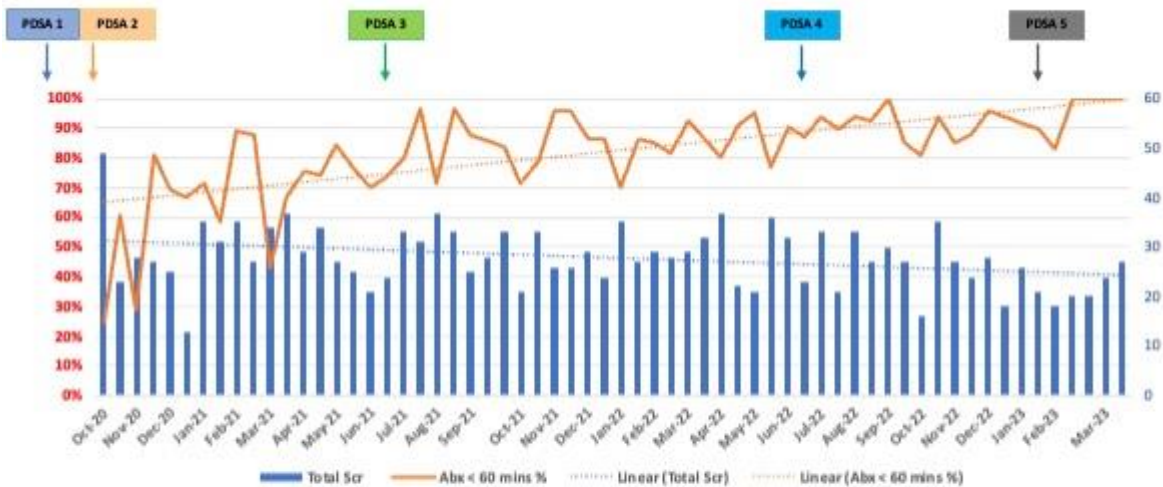
A single dose of Intramuscular antibiotic for difficult cannulations.

**Results:** 1729 babies (admitted to the neonatal unit and post natal ward) were screened for infection over 29 months. Median percentage of babies receiving antibiotics within 60 minutes of decision to treat improved from 64% (Q4; Oct - Dec 2020) to 100% (Q1; Jan - Mar 2023).

The number of infection screens reduced from a peak of 35 screens (Median; Q1; Jan - Mar 2021) to 21 (Median; Q1; Jan - Mar 2023) with the noticeable decrease in the number of babies being screened on the post natal ward.

Conclusion: Analysis and identification of barriers using QI methodology has allowed for targeted interventions that have streamlined processes, engaged stakeholders and produced sustainable changes.

Neonates requiring treatment for suspected sepsis now receive antibiotics within 60 minutes of the decision to treat. The number of neonates with infection risk factors being empirically treated with antibiotics has safely reduced with the introduction of KPSRC.





## ID 317. Neonatal Leukemoid Reaction in Term Neonates: Five Cases Series

Doctor Smiljana Mihailovic<sup>1</sup>, Doctor Marija Milic<sup>1</sup>, Doctor Tamara Sljivancanin Jakovljevic<sup>1</sup>, Doctor Ksenija Miletic<sup>1</sup>, Doctor Tanja Lazic Mitrovic<sup>1</sup>

<sup>1</sup>Gynecology And Obstetrics Clinic Narodni Front

Background: A leucocyte count of more than  $50 \times 10^9/L$  or a neutrophil count of more than  $30 \times 10^9/L$  in the neonatal period is considered as the leukemoid reaction. There is still no physiological explanation for this inflammatory reflex, and it is suggested that it may be a part of the inflammatory response to various fetal and/or perinatal insults. Neonatal leukemoid reaction has been associated with the use of antenatal steroids, prematurity, chromosomal abnormalities, infections, anemia, as well as with severe hypoxia. Data in literature are still scarce and so far have been predominantly focused on extremely preterm neonates.

Case report: Hereby we present five cases of term infants with leukemoid reaction, born in Gynecology and Obstetrics Clinic Narodni Front in Belgrade, Serbia, from October 2022 till March 2023. All neonates expressed leukemoid reaction with leucocyte count varying from  $51.2$  to  $69.9 \times 10^9/L$  in the first 24 hours after the delivery. Four infants were delivered by emergency section, whereas one was born vaginally. Three caesarean sections were performed because of an imminent and incipient asphyxia. Two mothers had history of diabetes - one had severe insulin dependent diabetes as well as preeclampsia, and the second mother had gestational diabetes combined with obesity and hypertension. Two neonates were hypertrophic with birth weight of more than 4500 g. Among five cases, one had respiratory distress syndrome with the necessity for inhaled nitric oxide treatment, while one was affected by severe perinatal asphyxia, demanded artificial mechanical ventilation and therapeutic hypothermia. The remaining three had mild respiratory distress. After appropriate initial stabilization and required treatment, all children were released home. No complications of hyperleucocytosis were noted.

Conclusion: Neonatal leukemoid reaction in the first days can be present in preterm as well as in term neonates with no significant complications. Causes might be related to different perinatal and neonatal insults. A watchful waiting approach is justified to decrease frequency of excessive and invasive diagnostic procedures performance.

328

## MARKERS FOR EARLY DIAGNOSIS OF LATE-ONSET SEPSIS IN NEWBORNS

MD Preslava Radoslavova Gatseva<sup>1,2</sup>, Assistant Prof. Alexander Blajev<sup>1</sup>, Dr Zarko Yordanov<sup>1</sup>, Prof. Victoria Atanasova<sup>1,2</sup>

<sup>1</sup>Medical University- Pleven, <sup>2</sup>University Hospital "Dr Georgi Stranski"

### BACKGROUND

Early diagnosis of late onset sepsis (LOS) in newborns is a great challenge, because in the initial phase of a systemic infection, clinical symptoms are often non-specific, and routinely used hematological markers are not sufficiently informative.

The aim of this study is to determine the level of early inflammatory markers of LOS in neonates – procalcitonin (PCT), interleukin 6 (IL-6), interleukin 8 (IL-8) and endocan (ESM-1); to analyze their sensitivity, specificity, precision, positive and negative predictive value; to compare them with C-reactive protein (CRP) and immature to total neutrophil ratio (I:T index).

### METHODS

A prospective (January, 2022 – January, 2023) clinical-epidemiological study was conducted in a third level neonatal intensive care unit in Pleven, Bulgaria. Preterm and term newborns with hospital stay more than 72 hrs were included in the study. All patients were divided in three groups: without signs of nosocomial infection (Group 0), with symptoms, suggestive of nosocomial infection that was later proven (Group 1) or not proven (Group 2). Inflammatory markers were tested. A sandwich ELISA method was used to determine the markers in serum. The data was processed with the statistical packages IBM SPSS Statistics 25.0. and Excel on Office 2021.

### RESULTS

Sixty newborns with a mean gestational age of 29.75±3.61 gestational weeks were included: Group 0 – 31.7%, Group 1 – 35.0%, Group 2 – 33.3%. The comparative analysis by value in the three groups showed a significant difference for PCT, IL-6 and I:T index. For the markers ESM-1, IL-8 and CRP, the difference was statistically insignificant. PCT, IL-6 and I:T were presented by significant threshold values (0.46, 27.5 and 0.33 respectively). The best sensitivity (78%) and negative predictive value (84%) was found for IL-6; best specificity (97%) and positive predictive value (80%) for I:T index. The best precision (78%) was calculated for the combination of PCT + IL-6 + I:T index.

### CONCLUSION

The introduction into routine practice of indicators such as PCT and IL-6 may provide an opportunity to promptly optimize the therapeutic approach and reduce the complications of nosocomial infections. More research is needed on other early biomarkers of inflammation.



Marker	Threshold vaue	Sensitiviy (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)	Precision (%)
PCT	≥ 0.46*	76	74	64	84	75
PCT	≥ 0.5	71	74	63	81	73
IL-6	≥ 27.5*	78	70	56	87	73
I:T index	≥ 0.335*	50	80	59	74	69
I:T index	≥ 0.25	20	97	80	68	69
PCT + IL-6 + I:T index	≥ 0.317*	67	84	71	81	78

\* These thresholds were calculated from data from the present study



## ID 396. Novel Oxidative Stress Biomarker Advanced Oxidation Protein Products (AOPPs) for Early Diagnosis of Oxidative Stress-Related Diseases in Infants of Preeclamptic Mothers

Doctor Sema Tanriverdi<sup>1</sup>, doktor İzel Kutlu Can<sup>2</sup>, Prof Fatma Taneli<sup>3</sup>

<sup>1</sup>Manisa Celal Bayar University Medical School, Department of Pediatrics, Division of Neonatology,

<sup>2</sup>Manisa Celal Bayar University Medical School, Department of Pediatrics, <sup>3</sup>Manisa Celal Bayar University Medical School, Department of Medical Biochemistry

**Purpose:** The aim of this study was to evaluate the oxidative and antioxidative status in infants of preeclamptic mothers and to show the association of oxidative stress and AOPPs, a biomarker of oxidative stress, with free radical damage-related diseases such as RDS, PDA, BPD, ROP, IVH, NEC.

**Method:** In our study, 30 preterm infants with neonatal intensive care needs born to preeclamptic mothers under 37 weeks of gestation were included as the patient group and 30 preterm infants with neonatal intensive care needs born to non-preeclamptic mothers were included as the control group. TOS, TAS, 8-OHdG and AOPPs biomarkers were studied in the cord blood of the babies in serum samples taken consecutively on days 1, 3 and 7. Oxidant and antioxidant status, protein and DNA damage levels of infants in the patient and control groups were compared. The relationship between the levels of these biomarkers and diseases caused by oxidative damage (RDS, BPD, NEC, ROP, IVH, PDA) that may occur during hospitalization was examined.

**Findings:** The AOPPs value of the patient group was higher than the control group at all time points on days 1, 3 and 7 and this difference between the groups was statistically significant ( $p < 0.001$ ). There was no statistically significant difference between the patient and control groups for 8-OHdG and TAS values at all time points on days 1, 3 and 7 ( $p > 0.05$ ). The TOS value in the cord blood of the patient group was higher than in the control group and this difference between the groups was statistically significant ( $p = 0.005$ ). There was no statistically significant difference between the patient and control groups for TOS values on days 1, 3 and 7 ( $p > 0.05$ ). There was no statistically significant difference between TOS, TAS, 8-OHdG, AOPPs values measured consecutively in the first 1 week of life and RDS, BPD, NEC, ROP, IVH, PDA, which are diseases associated with oxidative stress ( $p > 0.05$ ).

**Result:** AOPPs may be used as a novel biomarker for early diagnosis of oxidative damage in infants of preeclamptic mothers. Further studies on the usefulness of AOPPs in the early diagnosis of oxidative stress-related diseases are needed.



## ID 410. Multifocal osteomyelitis in a preterm neonate: a case study

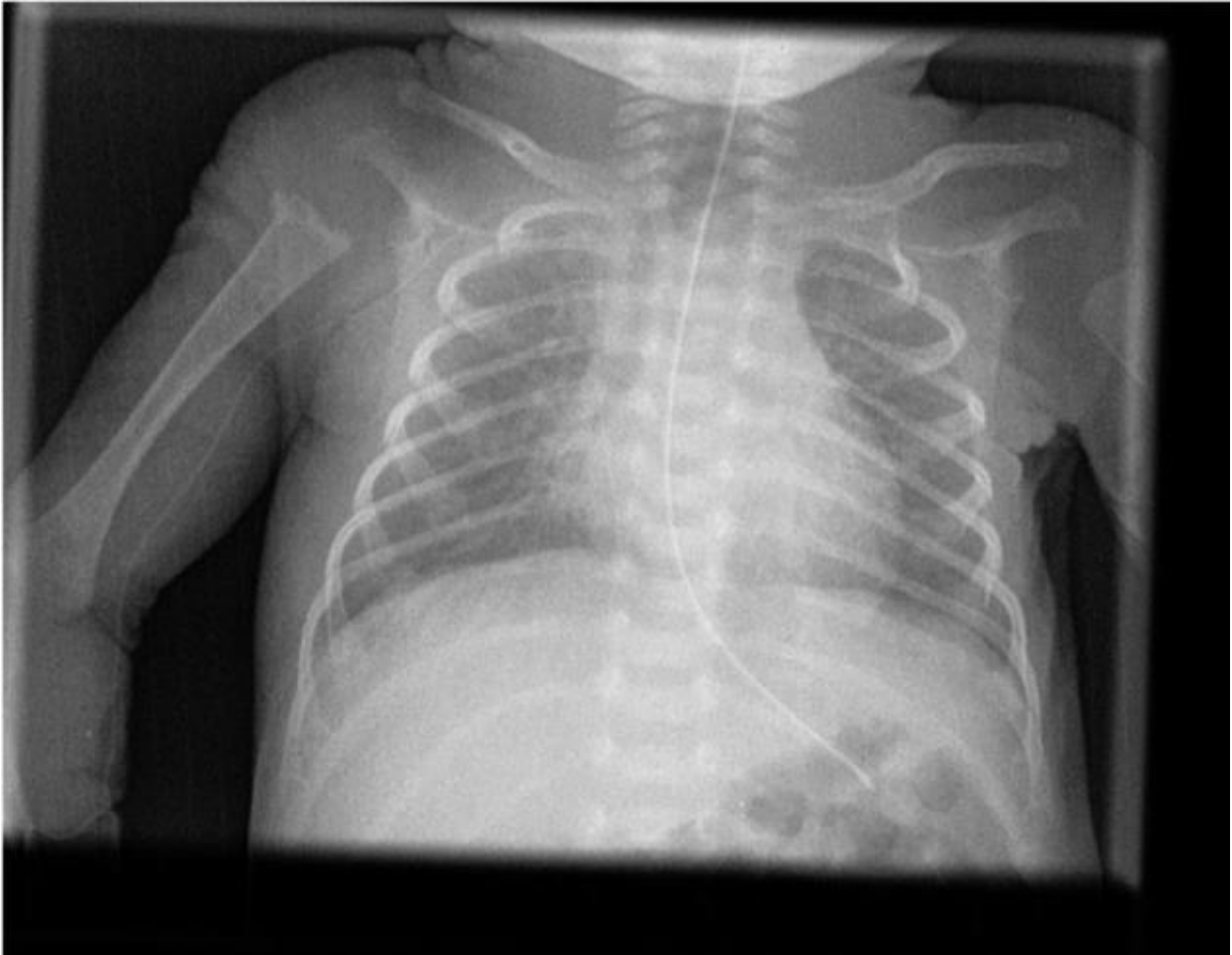
Doctor Jack Fletcher<sup>1</sup>, Doctor Leanne Dearman<sup>2</sup>, Doctor Kumar Swamy<sup>2</sup>, Doctor Bernard Schoonakker<sup>2</sup>

<sup>1</sup>Royal Derby Hospital, Derby, England, <sup>2</sup>Nottingham City Hospital

**Background:** Osteomyelitis is a rare condition in neonates but when it does occur it primarily affects the metaphysis of long bones. This can form an abscess leading to vessel occlusion, tissue ischaemia, infarction and bone marrow hyperplasia. All of which can lead to coarsening of the normal trabecular pattern, demineralisation and abnormal bone formation with lifelong consequences. The disease is mainly caused by *S. aureus* and has a multi-bone involvement in neonates.

**Case report:** Female infant born at 26+5 weeks at 955g. On day 14 of life she developed a temperature of 37.7°C with an increase in lactate and glucose levels. She underwent a full septic screen, including a peripheral blood culture and lumbar puncture (LP) and was started on flucloxacillin, gentamicin and fluconazole as per the local microbial guidelines. CRP was 134 mg/L and a chest x-ray showed a right sided middle lobe collapse and thickened bowel wall so was also treated as suspected necrotising enterocolitis with 10 days of metronidazole. A blood culture grew staphylococcal aureus on two samples, the CSF was normal and an echo was normal. A new central line was placed on day 16 of life and right humeral head irregularities were noticed incidentally with swelling of the same shoulder two days later. MRI confirmed osteomyelitis and a course of 6 weeks of rifampicin and flucloxacillin was initiated. On day 32 her left thigh became swollen with an x-ray showing an abnormality to the proximal femoral metaphysis and assumed as a secondary site of osteomyelitis. She was reviewed by the orthopaedic team and surgery was not deemed necessary. She completed the course of antibiotics with oramorph and paracetamol as pain relief. Follow up x-rays at 6 weeks were normal.

**Conclusion:** This neonate iterates the utmost importance of embracing a systemic approach to an unwell baby, as well as carrying out a full examination, including long bones, in those who grow *S. aureus*. This case report also reflects the importance of a multi-disciplinary team approach to ensure a rapid and appropriate management plan is in place, especially when dealing with an unusual diagnosis.



The chest X-ray at day 26 with humeral head irregularities