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Section on Neonatal-Perinatal Medicine

ARTICLES OF INTEREST – April 2021

Lung ultrasound score progress in neonatal respiratory distress syndrome

Francesco Raimondi, Fiorella Migliaro, Iuri Corsini, et al. *Pediatrics.*
The authors used lung ultrasound score (LUS) to monitor respiratory status in preterm neonates with RDS. This study enrolled 240 preterm neonates stratified in 3 gestational age cohorts (25-27, 28-30, and 31-33 weeks), who underwent weekly lung ultrasounds from birth. A significant correlation was noted between LUS and the ratio of oxygen saturation to inspired oxygen throughout the admission, increasing with gestational age. Infants with complications had a higher LUS already at birth (P = .001). Also, LUS at 7 days of life predicted bronchopulmonary dysplasia with an area under the curve of 0.82 (95% CI 0.71 to 93) in infants 25 to 30 weeks' gestation.

Prenatal repair and physical functioning among children with myelomeningocele: a secondary analysis of a randomized clinical trial

Amy J Houtrow, Cora MacPherson, Janet Jackson-Coty, et al. JAMA Pediatr.
The Management of Myelomeningocele Study Follow-up (MOMS2) describes secondary analysis of the previous randomized clinical trial (MOMS) comparing physical functioning outcomes (self-care skills, functional mobility, walking skills, and motor level) between prenatal repair and postnatal repair at ages 5 to 10 years old. Trained examiners without knowledge of the treatment group evaluated the physical characteristics, self-care skills, neurologic function, and mobility of the children. Of the 161 children enrolled in MOMS2, 154 had a physical examination and were included in the analyses. This study found that the physical functioning benefits of prenatal repair for myelomeningocele reported at age 30 months persisted into school age.

Single neonatal dexamethasone administration has long-lasting outcome on depressive-like behaviour, Bdnf, Nt-3, p75ngfr and sorting receptors (SorCS1-3) stress reactive expression

D A Lanshakov, E V Sukhareva, V V Bulygina, et al. Sci Rep.
Antenatal steroids lead to elevated glucocorticoid levels in the postnatal period and may be associated with long-lasting behavioral effects. To understand the mechanisms relating to behavioral changes, the authors studied neurotropins in the brains. They found altered neurotropin levels and receptors in the hippocampus and brainstem that accompanied a decrease in depressive-like behavior in adolescent rats.

Increased Brain Age Gap Estimate (BrainAGE) in young adults after premature birth

Dennis M Hedderich, Aurore Menegaux, Benita Schmitz-Koep, et al. Front Aging Neurosci.
To understand the lasting consequences of premature birth on brain aging, the authors studied brain age gap estimates (BrainAGE) using structural MRI in a large cohort of young premature-born adults (n = 101) and full-term (FT) controls (n = 111). They found increased BrainAGE in premature-born adults compared to FT, which was associated with low gestational age, low birth weight, and increased neonatal treatment intensity.

Hydrogen and therapeutic gases for neonatal hypoxic-ischemic encephalopathy: potential neuroprotective adjuncts in translational research

Yinmon Htun, Shinji Nakamura and Takashi Kusaka. Pediatr Res.
This article reviews therapeutic gases, particularly hydrogen, and their potentials and limitations for the treatment of HIE in newborns. The authors report that hydrogen ventilation as a single agent or in combination with therapeutic hypothermia has shown short- and long-term neuroprotection in neonatal translational HIE models, likely due to its antioxidative properties. Further research needs to be completed to determine the optimal dose, timing, and disease target severity in neonates.

Loop diuretics in severe bronchopulmonary dysplasia: cumulative use and associations with mortality and age at discharge

Nicolas A Bamat, Timothy D Nelin, Eric C Eichenwald, et al. J Pediatr.
Using the PHIS database, records were reviewed for 3252 preterm infants born <32 weeks with grade 2 or 3 BPD from Jan 2007 – July 2016 across 43 US children's hopsitals. 95% were exposed to a loop diuretic, 97% of which was furosemide. The adjusted proportion of patient days with loop diuretic exposure varied across centers from 7% to 49%. Mortality did not vary by loop diuretic use, nor did PMA at discharge. High-use centers were more likely to discharge patients home on loop diuretics than low use centers. The authors conclude that loop diuretic exposure is extremely common among preterm infants with no survival or length-of-stay differences between high-use and low-use centers. They call for further research to understand the balance of the risks and benefits of these medications.

Patient characteristics and treatment outcomes of symptomatic catheter-related arterial thrombosis in infants: a retrospective cohort study

Clay T Cohen, Viia Anderson, Sudhen B Desai, et al. J Pediatr.
This single-center review reports on 99 infants who had catheter-related arterial thrombosis treated with anticoagulation over an 8-year period. Thrombosis with indwelling arterial catheter or after cardiac catheterization was identified by Doppler US when suspected by the clinical team. Platelets, D-dimer, fibrinogen, PT, and PTT were collected prior to starting anticoagulation. Patients were treated with heparin targeting anti-FXa 0.3-0.7 or PTT 70-110s or with low-molecular weight heparin targeting anti-Xa 0.5-1. Duration of therapy was a median 24 days, and 40% received a 28-day course as recommended by the local guideline. Some patients were also treated with antithrombin, catheter-directed thrombolysis, and/or thrombectomy. Thrombus after cardiac catherization was more likely to be occlusive. Complete resolution occurred in 60% of patients and was more likely with earlier recognition of the thrombus (1 vs 5 days after arterial catheterization). Therapy was complicated by bleeding in only 4% of patients.

International comparison of guidelines for managing neonates at the early phase of the SARS-CoV-2 pandemic

Anna Lavizzari, Claus Klingenberg, Jochen Profit, et al. Pediatr Res.

In this article, the authors as part of the International Neonatal COVID-19 consortium in six continents (20 countries) exchanged and compared protocols on management of neonates born to SARS-CoV-2 positive mothers. The focused on central protocol components, including triaging, hygiene precautions, management at delivery, feeding protocols, and visiting policies. The authors found that disease burden varied between countries at the time of analysis. In most countries, asymptomatic infants were allowed to stay with the mother and breastfeed with hygiene precautions. However discrepancies were detected between national guidance in particular regarding triaging, use of personal protection equipment, viral testing, and visitor policies and local protocols deviated from national guidance.

Clinical tolerance of in-neonatal intensive care unit administration of rotavirus vaccine

Courtney Briggs-Steinberg, David Aboudi, Gabrielle Hodson, et al. Am J Perinatol.
The authors sought to determine the tolerance of NICU-based administration of RV5 in premature infants and to compare the rate of clinically significant adverse events after RV5 immunization to the standard 2-month shot series and to historical controls who were not immunized. They found no increase in the number of infants with clinically significant adverse events when comparing after RV5 to prior to RV5, after the 2-month shot series, or to the historical controls. They conclude that RV5 is well tolerated in premature infants and does not result in clinically significant adverse events when administered in NICU-hospitalized infants.

OTHER NOTEWORTHY PUBLICATIONS – November, 2020

COVID – 19

Rapid synthesis of a changing evidence base during the COVID-19 pandemic: the NeoCLEAR Project (Perspective) (PDF)
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7930517/pdf/41372_2021_Article_1020.pdf
Difference in levels of SARS-CoV-2 S1 and S2 subunits- and nucleocapsid protein-reactive SIgM/IgM, IgG and SIgA/IgA antibodies in human milk
https://www.nature.com/articles/s41372-020-00805-w.pdf
International comparison of guidelines for managing neonates at the early phase of the SARS-CoV-2 pandemic
https://pubmed.ncbi.nlm.nih.gov/32541844
Newborn antibodies to SARS-CoV-2 detected in cord blood after maternal vaccination – a case report (PDF)
https://bmcpediatr.biomedcentral.com/track/pdf/10.1186/s12887-021-02618-y.pdf
Coronavirus disease 2019 infection and placental histopathology in women delivering at term
https://pubmed.ncbi.nlm.nih.gov/33091406
New-onset myocardial injury in pregnant patients with coronavirus disease 2019: a case series of 15 patients
https://pubmed.ncbi.nlm.nih.gov/33098814
Epidemiology of coronavirus disease 2019 in pregnancy: risk factors and associations with adverse maternal and neonatal outcomes
https://pubmed.ncbi.nlm.nih.gov/32986989
Coronavirus disease 2019 and first-trimester spontaneous abortion: a case-control study of 225 pregnant patients
https://pubmed.ncbi.nlm.nih.gov/33039396

Immunity and coagulation and fibrinolytic processes may reduce the risk of severe illness in pregnant women with coronavirus disease 2019
https://pubmed.ncbi.nlm.nih.gov/33098813
COVID-19 vaccination in pregnant and lactating women
https://pubmed.ncbi.nlm.nih.gov/33555297
Pregnancy, postpartum care, and covid-19 vaccination in 2021
https://pubmed.ncbi.nlm.nih.gov/33555287
COVID-19-related potential multisystem inflammatory syndrome in childhood in a neonate presenting as persistent pulmonary hypertension of the newborn
https://pubmed.ncbi.nlm.nih.gov/33464010

Pediatrics
Survival of ventilated extremely premature neonates with severe intraventricular hemorrhage
https://pubmed.ncbi.nlm.nih.gov/33727247
Uncertainty at the limits of viability: a qualitative study of antenatal consultations
https://pubmed.ncbi.nlm.nih.gov/33658319
Lung ultrasound score progress in neonatal respiratory distress syndrome
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Commentary: decision-making for extremely preterm infants with severe intraventricular hemorrhage
https://pubmed.ncbi.nlm.nih.gov/33727248
Research brief: simulation-based neonatal resuscitation team training: a systematic review
https://pubmed.ncbi.nlm.nih.gov/33762309
Neonatal outcomes from arboviruses in the perinatal period: a state-of-the-art review
https://pubmed.ncbi.nlm.nih.gov/33737375
Case report: fetal inflammatory response syndrome associated with maternal sars-cov-2 infection
https://pubmed.ncbi.nlm.nih.gov/33122348
Case report: cutting ties with an old friend: omphalitis and bacteremia with umbilical cord nonsevera nce
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Journal of Pediatrics
Individualized dextrose dosing for neonatal hypoglycemia (pdf)
https://www.jpeds.com/article/s0022-3476(21)00132-3/pdf
The long and winding road: loop diuretics in neonatology (pdf)
https://www.jpeds.com/article/s0022-3476(20)31556-0/pdf
Are breastfed infants iron deficient? the question that won't go away (pdf)
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A substantial proportion of 6- to 12-month-old infants have calculated daily absorbed iron below recommendations, especially those who are breastfed (pdf)
https://www.jpeds.com/article/s0022-3476(20)31370-6/pdf
Loop diuretics in severe bronchopulmonary dysplasia: cumulative use and associations with mortality and age at discharge
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Early skin-to-skin care with a polyethylene bag for neonatal hypothermia: a randomized clinical trial
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A graded approach to intravenous dextrose for neonatal hypoglycemia decreases blood glucose variability, time in the neonatal intensive care unit, and cost of stay
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Alternative cerebral fuels in the first five days in healthy term infants: the glucose in well babies (GLOW) study
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Acute kidney injury associated with late-onset neonatal sepsis: a matched cohort study
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Patient characteristics and treatment outcomes of symptomatic catheter-related arterial thrombosis in infants: a retrospective cohort study
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Review: Nitric oxide and the brain. Part 1: Mechanisms of regulation, transport and effects on the developing brain
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Review: Nitric oxide and the brain. Part 2: Effects following neonatal brain injury—friend or foe?
https://pubmed.ncbi.nlm.nih.gov/32563184
Review: Hydrogen and therapeutic gases for neonatal hypoxic–ischemic encephalopathy: potential neuroprotective adjuncts in translational research
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Review: T-piece resuscitator or self-inflating bag during neonatal resuscitation: a scoping review
https://pubmed.ncbi.nlm.nih.gov/32526766
Inter-device reproducibility of transcutaneous bilirubin meters (PDF)
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Active free secretory component and secretory IgA in human milk: do maternal vaccination, allergy, infection, mode of delivery, nutrition and active lifestyle change their concentrations?
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Characterization of the innate immune response in a novel murine model mimicking bronchopulmonary dysplasia
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Changes in pulmonary oxygen content are detectable with laser absorption spectroscopy: proof of concept in newborn piglets
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Changes in arginase isoforms in a murine model of neonatal brain hypoxia–ischemia
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Impairment in neurocognitive function following experimental neonatal guinea pig cytomegalovirus infection
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Troponin T amino acid mutation (ΔK210) knock-in mice as a neonatal dilated cardiomyopathy model
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Autonomic nervous system maturation in the premature extrauterine milieu
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The hidden consequence of intraventricular hemorrhage: persistent cerebral desaturation after IVH in preterm infants
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Regional heterogeneity of cerebral hemodynamics in mild neonatal encephalopathy measured with multichannel near-infrared spectroscopy
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MiR-29b is associated with perinatal inflammation in extremely preterm infants
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Low hemoglobin levels are independently associated with neonatal acute kidney injury: a report from the AWAKEN Study Group
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Effect of fetal growth restriction on urinary podocalyxin levels at birth in preterm neonates
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Clinical risk factors for the development of late-onset circulatory collapse in premature infants
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Parents' ratings of post-discharge healthcare for their children born very preterm and their suggestions for improvement: a European cohort study
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Editorial: The clinical usefulness of cerebral oximetry (PDF)
https://www.nature.com/articles/s41372-021-00939-5.pdf
Comment: Does heterozygosity for UGT1A1 *28 convey increased risk for severe neonatal jaundice?
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Emerging therapies and management for neonatal encephalopathy—controversies and current approaches (PDF)
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Neonatal NIRS monitoring: recommendations for data capture and review of analytics (PDF)
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Revisiting the definition of bronchopulmonary dysplasia in premature infants at a single center quaternary neonatal intensive care unit
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Survival and associated risk factors for mortality among infants with persistent pulmonary hypertension of the newborn in Malaysia (PDF)
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Using quality improvement to implement consensus guidelines for postnatal steroid treatment of preterm infants with developing bronchopulmonary dysplasia
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Does mild hypoxic ischemic encephalopathy adversely affect neurodevelopmental outcome? (Journal club)
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Effect of a nonoptimal cervicovaginal microbiota and psychosocial stress on recurrent spontaneous preterm birth
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Risk of neonatal short-term adverse outcomes associated with noninfectious intrapartum hyperthermia: a nested case-control retrospective study
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Craniosynostosis: neonatal perspectives

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Case 2: intergluteal sulcus flattening in a newborn
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Case 3: what's that smell? the significance of infant body odors in the evaluation of metabolic acidosis
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Lagging in size: the use of fetal dopplers
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Visual diagnosis: neck mass in a full-term infant with hypoxic-ischemic encephalopathy
https://pubmed.ncbi.nlm.nih.gov/33795405
Fetal lower urinary tract obstruction complicated by bladder perforation
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JAMA Pediatrics
Long-term outcomes of children after fetal surgery for spina bifida—toward sustainability
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Effectiveness of interventions on early neurodevelopment of preterm infants: a systematic review and meta-analysis (PDF)
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Growth patterns and clinical outcomes in association with breastfeeding duration in HIV exposed and unexposed infants: a cohort study in KwaZulu Natal, South Africa (PDF)
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Treatment administered to newborns with congenital syphilis during a penicillin shortage in 2015, Fortaleza, Brazil (PDF)
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Reference intervals for 26 common biochemical analytes in term neonates in Jilin Province, China (PDF)
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NOX5 is expressed aberrantly but not a critical pathogenetic gene in Hirschsprung disease (PDF)
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Challenge in diagnosis of late onset necrotizing enterocolitis in a term infant: a case report (PDF)
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Management of Comprehensive Care of multiple-birth infants from fetal to infancy period: challenges, training, strategies (PDF)
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Growth of preterm very low birth weight infants discharged with weight of less than 1500 grams (PDF)
https://bmcpediatr.biomedcentral.com/track/pdf/10.1186/s12887-021-02612-4.pdf
Growth and neurodevelopment in low birth weight versus normal birth weight infants from birth to 24 months, born in an obstetric emergency hospital in Haiti, a prospective cohort study (PDF)
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Protocol for implementation of an evidence based parentally administered intervention for preterm infants (PDF)
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Applying the RE-AIM framework to evaluate the implementation of the Supporting and Enhancing NICU Sensory Experiences (SENSE) program (PDF)
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Respiratory variation in aortic blood flow velocity in hemodynamically unstable, ventilated neonates: A pilot study of fluid responsiveness
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Antenatal dexamethasone for early preterm birth in low-resource countries.
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