ARTICLES OF INTEREST – May, 2016

**Neonatal inflammatory pain and systemic inflammatory responses as possible environmental factors in the development of autism spectrum disorder of juvenile rats**

Because the pathogenesis of autism spectrum disorder (ASD) is poorly understood, the authors examined the relationship of formalin-induced inflammatory pain on the development of ASD in rats. They found diminished neurogenesis in formalin-treated pups and reduced expression of ASD-related genes in a pattern analogous to ASD. Additionally, juvenile rats in the formalin group showed hyperalgesia, repetitive behaviors, abnormal locomotion, sleep disorder, and distinct deficits in social memory and social activities which were more evident in male than in female rats. Treatment with indomethacin suppressed inflammatory responses, neuronal cell death, the alterations in ASD-related genes, and the abnormal behaviors. The authors conclude that prevention of pain stimuli and inflammation during development possibly disrupts the evolution of ASD syndromes.

**Improving care for neonatal abstinence syndrome**

A multicenter quality improvement collaborative was designed and implemented with an objective to determine if the collaborative was effective in standardizing hospital policies and improving patient outcomes in infants being treated for neonatal abstinence syndrome (NAS). Data was collected through serial cross sectional audits of the 199 participating centers from 2012 to 2014. Along with an increase in NAS focused guidelines, there was a decrease seen in the length of pharmacologic treatment and length of stay of patients. In addition, there was a statistically significant decrease in the proportion of infants discharged on medication. Thus the QI project was associated with increases in standardizing hospital patient care policies and decreases in health care utilization.

**Quality improvement initiative to reduce the necrotizing enterocolitis rate in premature infants**

Necrotizing enterocolitis (NEC) is the most common gastrointestinal emergency affecting VLBW (<1500 g) infants and a leading cause of neonatal morbidity and mortality. Using a quality improvement methodology that included use of mother’s own breast milk or donor breast milk in the first 3 days, early initiation of feeds and keeping the NPO only during transfusion of blood products, restricting feeds to 10 or 20 ml/kg/day during indomethacin treatment, and restricting use of ranitidine, NEC rate was reduced from 8.0% to <4.0% in the Nationwide Children’s Hospital and 6 affiliated NICUs.
Antenatal corticosteroids in the late preterm period: a prospective cohort study

In a recent multicenter trial published in 2016, use of betamethasone to women at risk for late preterm delivery significantly reduced the rate of neonatal respiratory complications. However, in this small prospective cohort study in late preterm infants exposed to antenatal steroids did not show any benefits in terms of decreasing RDS, TTN, hypothermia, need for NICU admission or need for phototherapy.

Effect of early prophylactic high-dose recombinant human erythropoietin in very preterm infants on neurodevelopmental outcome at 2 years: a randomized clinical trial

Prior clinical and pre-clinical studies have demonstrated neuroprotective effects of erythropoietin. In this multicenter randomized trial in Switzerland, 448 preterm infants born between 26 0/7 to 31 6/7 weeks’ gestation were randomized to early recombinant human erythropoietin or placebo, with the first dose administered within 3 hours of birth and two additional doses before 42 hours of age. There was no significant difference in neurodevelopmental outcome at 2 years, measured by the mental developmental index of the Bayley Scales of Infant Development-2nd edition, between erythropoietin treatment and placebo groups [mean difference -1.0; 95% CI -4.5 to 2.5].

Smaller cerebellar growth and poorer neurodevelopmental outcomes in very preterm infants exposed to neonatal morphine

This prospective cohort study included 136 preterm infants (24 to 32 weeks gestational age) who received MRIs near birth and at term equivalent. In addition, motor and cognitive outcomes were evaluated at 18 months. After adjustment for cofounders, the authors found that a 10-fold increase in morphine exposure was related to a 5.5% decrease in cerebellar volume (p=0.04) and also predicted poorer motor (p<0.001) and cognitive (p=0.006) outcomes at 18 months corrected age.

Early postnatal docosahexaenoic acid levels and improved preterm brain development

Premature birth has a dramatic impact on polyunsaturated fatty acid exposures for the developing brain. A cohort of 60 preterm newborns (24-32 wk GA) was assessed using early and near-term MRI studies. Red blood cell fatty acid composition was analyzed and coordinated with each scan. Outcome at a mean of 33 months corrected age was assessed using the Bayley Scales of Infant Development. Higher docosahexaenoic acid and lower linoleic acid levels in the first few weeks of life are associated with decreased intraventricular hemorrhage, improved microstructural brain development, and improved outcomes in premature infants.

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**OTHER NOTEWORTHY PUBLICATIONS – May, 2016**

*Pediatrics*
Human metapneumovirus circulation in the United States, 2008 to 2014
Foreskin morbidity in uncircumcised males
Prophylactic dosing of vitamin K to prevent bleeding
Respiratory decompensation and immunization of preterm infants
Pubertal height growth and adult height in cystic fibrosis after newborn screening
Emotional and behavioral problems of preterm and full-term children at school entry
Utility of decision rules for transcutaneous bilirubin measurements
Changing societal and lifestyle factors and breastfeeding patterns over time
Commentary: The circumcision debate: beyond benefits and risks
From the AAP: Standard terminology for fetal, infant, and perinatal deaths
From the AAP: Brief resolved unexplained events (formerly apparent life-threatening events) and evaluation of lower-risk infants: Executive summary
Birth spacing and risk of autism and other neurodevelopmental disabilities: a systematic review
Zika virus disease: a CDC update for pediatric health care providers
Lessons learned from newborn screening for critical congenital heart defects
What if the prenatal diagnosis of a lethal anomaly turns out to be wrong?

Journal of Pediatrics
Maternal obesity affects inflammatory and iron indices in umbilical cord blood
Caffeine exposure and risk of acute kidney injury in a retrospective cohort of very low birth weight neonates
Genetic factors contribute to risk for neonatal respiratory distress syndrome among moderately preterm, late preterm, and term infants
Elevated blood pressure with reduced left ventricular and aortic dimensions in adolescents born extremely preterm
Brain volumes at term-equivalent age in preterm infants: imaging biomarkers for neurodevelopmental outcome through early school age
Extremely preterm-born infants demonstrate different facial recognition processes at 6-10 months of corrected age
Initial presentation of neonatal herpes simplex virus infection
Cost-effectiveness/cost-benefit analysis of newborn screening for severe combined immune deficiency in Washington State
Multimodal outcome at 7 years of age after neonatal arterial ischemic stroke
Does the use of pacifier affect gastro-esophageal reflux in preterm infants?
Pediatric Research
Neonatal mortality in the urban and rural China between 1996 and 2013: a retrospective study
Body composition in late preterm infants according to percentile at birth
Predictive factors and practice trends in red blood cell transfusions for very-low-birth-weight infants
Association of brain injury and neonatal cytokine response during therapeutic hypothermia in newborns with hypoxic-ischemic encephalopathy
Propofol administration to the fetal–maternal unit reduces cardiac oxidative stress in preterm lambs subjected to prenatal asphyxia and cardiac arrest
Dose-dependent effects of glucocorticoids on pulmonary vascular development in a murine model of hyperoxic lung injury
The transcriptome of nitrofen-induced pulmonary hypoplasia in the rat model of congenital diaphragmatic hernia
Polymorphisms in NR5A2, gene encoding liver receptor homolog-1 are associated with preterm birth
Toll-like receptor 4-mediated immune stress in pregnant rats activates STAT3 in the fetal brain: role of interleukin-6
Gestational diabetes induces alterations of sirtuins in fetal endothelial cells
A study of microRNAs from dried blood spots in newborns after perinatal asphyxia: a simple and feasible biosampling method

Archives of Disease in Childhood - Fetal & Neonatal Edition
Current status of neonatal intensive care in India
The effects of a one-to-one nurse-to-patient ratio on the mortality rate in neonatal intensive care: a retrospective, longitudinal, population-based study
Nurse staffing to patient ratios and mortality in neonatal intensive care.
Effect of surgical ligation of the patent ductus arteriosus on cerebral perfusion of premature infants in the postoperative period
Treating hypotension in extremely preterm infants. The pressure is mounting
A review of approaches to optimise chest compressions in the resuscitation of asphyxiated newborns
Respiratory transition in the newborn: a three-phase process
Neonatal EEG and neurodevelopmental outcome in preterm infants born before 32 weeks
In utero exposure to valproate increases the risk of isolated cleft palate
Resuscitative interventions during simulated asystole deviate from the recommended timeline
A propensity-matched cohort study of vancomycin-associated nephrotoxicity in neonates

Variables associated with the decreased risk of intraventricular haemorrhage in a large sample of neonates with respiratory distress syndrome

Preterm infant growth and asthma at age 8 years

The effects of non-invasive respiratory support on oropharyngeal temperature and humidity: a neonatal manikin study

Quantitative analysis of cranial ultrasonographic periventricular echogenicity in relation to early neuromotor development in preterm infants

Neurodevelopmental outcome in very low birthweight infants with pathological umbilical artery flow

**Journal of Perinatology**

Impact of antenatal steroids on intraventricular hemorrhage in very-low-birth weight infants (PDF)
http://www.nature.com/jp/journal/v36/n5/pdf/jp201638a.pdf

Relationship between parity and brachial plexus injuries

The role of fetal inflammatory response syndrome and fetal anemia in non-preventable term neonatal encephalopathy

A pilot prospective study of fetomaternal hemorrhage identified by anemia in asymptomatic neonates

Assessment of endotracheal tube placement in newborn infants: a randomized controlled trial (PDF)
http://www.nature.com/jp/journal/v36/n5/pdf/jp2015208a.pdf

Does measurement of four-limb blood pressures at birth improve detection of aortic arch anomalies?

Comparison of non-invasive vs invasive blood pressure measurement in neonates undergoing therapeutic hypothermia for hypoxic ischemic encephalopathy

Carboxyhemoglobin levels as a predictor of risk for significant hyperbilirubinemia in African-American DAT+ infants

Radiographic depiction of intra-abdominal fat in newborns: a marker of infants born to diabetic mothers

Safety of donor milk: a brief report

Bone status in preterm infant: influences of different nutritional regimens and possible markers of bone disease
http://www.ncbi.nlm.nih.gov/pubmed/26765552

Kangaroo care by fathers and mothers: comparison of physiological and stress responses in preterm infants
Neonatology
The effect of maternal antihypertensive drugs on the cerebral, renal and splanchnic tissue oxygen extraction of preterm neonates
Long-term outcomes of pulmonary hypertension in preterm infants with bronchopulmonary dysplasia (PDF)
http://www.karger.com/Article/Abstract/445476

American Journal of Perinatology
Ultrasonography for central catheter placement in the neonatal intensive care unit—a review of utility and practicality
Clefting of the alveolus: emphasizing the distinction from cleft palate
Association of C609T-inborn polymorphism of NAD(P)H: quinone oxidoreductase 1 with the risk of bronchopulmonary dysplasia in preterm neonates
Predictive capabilities of neurobehavioral diagnostics in early childhood
http://www.ncbi.nlm.nih.gov/pubmed/26683601
Homocysteine levels are not related to telomere length in cord blood leukocytes of newborns
Infant outcomes after periviable birth: external validation of the neonatal research network estimator with the BEAM trial
Treatment of patent ductus arteriosus with cyclo-oxygenase inhibitors beyond 2 weeks of age in very low birth weight infants
Association between hospital birth volume and maternal morbidity among low-risk pregnancies in rural, urban, and teaching hospitals in the United States
Migration of central venous catheters in neonates: a radiographic assessment
Prevention of preeclampsia with aspirin in multiple gestations: a systematic review and meta-analysis

Journal of Neonatal-Perinatal Medicine
Incorrect umbilical vein catheterization is associated with severe periventricular hemorrhages and mortality in extremely premature newborns
Incidence and risk factors of urinary tract infection in very low birth weight infants
Outcomes of peripherally inserted double lumen central catheter in very low birth weight infants

Maternal Health, Neonatology and Perinatology
New approaches to management of neonatal hypoglycemia

JAMA Pediatrics
Prenatal and perinatal determinants of lung health and disease in early life: a national heart, lung, and blood institute workshop report
**BMC Pediatrics**

The number of tracheal intubation attempts matters! A prospective multi-institutional pediatric observational study


Quality of EHR data extractions for studies of preterm birth in a tertiary care center: guidelines for obtaining reliable data


A novel fibrillin-1 gene missense mutation associated with neonatal Marfan syndrome: a case report and review of the mutation spectrum


Parental and staff perspectives of NICU research procedures


Imperforate anus with rectopenile fistula: a case report and systematic review of the literature


Efficacy and safety of fluconazole prophylaxis in extremely low birth weight infants: multicenter pre-post cohort study


**Pediatric Critical Care Medicine**

Strain echocardiography parameters correlate with disease severity in children and infants with sepsis


Fluid overload is associated with late poor outcomes in neonates following cardiac surgery


Fluid overload after neonatal cardiac surgery is bad: keep the bottles on the shelf, squeeze the patients...or both?


Functional outcomes and physical impairments in pediatric critical care survivors: a scoping review


Experience of circuit survival in extracorporeal continuous renal replacement therapy using small-calibre venous cannulae


**New England Journal of Medicine**

Efficacy of a single-dose, inactivated oral Cholera vaccine in Bangladesh


Randomized trial of introduction of allergenic foods in breast-fed infants (PDF)


Effect of avoidance on peanut allergy after early peanut consumption (PDF)


**Lancet**

Humoral and intestinal immunity induced by new schedules of bivalent oral poliovirus vaccine and one or two doses of inactivated poliovirus vaccine in Latin American infants: an open-label randomised controlled trial


Stillbirth in China


Impregnated central venous catheters for prevention of bloodstream infection in children (the CATCH trial): a randomised controlled trial


Induction of labour at term with oral misoprostol versus a foley catheter (PROBATT-II): a multicentre randomised controlled non-inferiority trial

Maternal and neonatal mortality after cesarean delivery

Effect of dilute apple juice and preferred fluids vs electrolyte maintenance solution on treatment failure among children with mild gastroenteritis: a randomized clinical trial

Infections in early life and development of type 1 diabetes

Primary cutaneous aspergillosis in a preterm infant

Learning and memory in children and adolescents with perinatal HIV infection and perinatal HIV exposure

Coverage and determinants of uptake for privately funded rotavirus vaccine in a Canadian birth cohort, 2008-2013

Neonatal meningitis caused by streptococcus galalcyticus

High procalcitonin levels in a newborn with erythroderma

Infection surveillance protocol for a multicountry population-based study in south Asia to determine the incidence, etiology and risk factors for infections among young infants of 0 to 59 days old

Challenges in implementation of the ANISA protocol at the Odisha site in India

Challenges in implementation of ANISA protocol at the Vellore site, India

Challenges in implementation of the ANISA protocol at the Matiari site, Pakistan

Implementation of the ANISA study in Karachi, Pakistan: challenges and solutions

Aetiology of neonatal infection in South Asia (ANISA): an initiative to identify appropriate program priorities to save newborns

Implementation of the ANISA protocol in Sylhet, Bangladesh: challenges and solutions

Classification of blood culture isolates into contaminants and pathogens on the basis of clinical and laboratory data

Methods employed in monitoring and evaluating field and laboratory systems in the ANISA study: ensuring quality

Using text messages for critical real-time data capture in the ANISA study

Opening the black box for etiology of neonatal infections in high burden settings: the contribution of ANISA

Development and implementation of the ANISA labeling and tracking system for biological specimens

Centralized data management in a multicountry, multisite population-based study
Laboratory methods for determining etiology of neonatal infection at population-based sites in South Asia: the ANISA study

Population-based novel molecular diagnostics to move the neonatal sepsis agenda forward

Cost analysis of fluconazole prophylaxis for prevention of neonatal invasive candidiasis

Risk factors for pertussis among Hispanic infants: metropolitan Portland, Oregon, 2010-2012

Variation in current management of term and late-preterm neonates at risk for early-onset sepsis: an international survey and review of guidelines

Estimating respiratory syncytial virus-associated hospitalization in the first year of life among infants born at 32-35 weeks gestation

**Pediatric Cardiology**

Extended application of the hybrid procedure in neonates with left-sided obstructive lesions in an evolving cardiac program

Optimal timing of pulmonary banding for newborns with single ventricle physiology and unrestricted pulmonary blood flow

MiRNA-145 regulates the development of congenital heart disease through targeting FXN

Myocardial oxidative stress in infants undergoing cardiac surgery

**Pediatric Neurology**

Maternal infections during pregnancy and cerebral palsy in the child

Establishing a role for polysomnography in hospitalized children

Nutritional status and nutrient intake challenges in children with spinal muscular atrophy

Hand sensorimotor function in older children with neonatal brachial plexus palsy

Mitochondrial encephalomyopathy lactic acidosis and stroke-like episodes (MELAS): a case report and critical reappraisal of treatment options

Successful treatment of paroxysmal movement disorders of infancy with dimenhydrinate and diphenhydramine

Effectiveness of corticosteroid therapy for acute neurological symptoms in incontinentia pigmenti

Effect of intrathecal baclofen on delayed-onset paroxysmal dystonia due to compression injury resulting from congenital and progressive spinal bone deformities in chondrodysplasia punctata
Committee opinion no. 664: Refusal of medically recommended treatment during pregnancy

Obstetric care consensus no. 4: Periviable birth

Preterm breech presentation: a comparison of intended vaginal and intended cesarean delivery

Gestational age of delivery in pregnancies complicated by chronic hypertension

Reducing cesarean delivery surgical site infection: successful implementation of a bundle of care

Current implementation of universal cervical length screening for preterm birth prevention in the United States

Rigorous simulation training protocol does not improve maternal and neonatal outcomes from shoulder dystocia

Monoamniotic monochorionic twins—can they be delivered safely via vaginal route?

Apgar score of 0 and seizure/serious neurologic dysfunction in home births of patients with prior cesarean delivery

Practice bulletin no. 163 summary: Screening for fetal aneuploidy

Practice bulletin no. 162 summary: Prenatal diagnostic testing for genetic disorders

Prior uterine evacuation of pregnancy as independent risk factor for preterm birth: a systematic review and metaanalysis

US term stillbirth rates and the 39-week rule: a cause for concern?

Males are from Mars, and females are from Venus: sex-specific fetal brain gene expression signatures in a mouse model of maternal diet-induced obesity

Alterations in expression of imprinted genes from the H19/IGF2 loci in a multigenerational model of intrauterine growth restriction (IUGR)

The placental membrane microbiome is altered among subjects with spontaneous preterm birth with and without chorioamnionitis

Evaluation of proteomic biomarkers associated with circulating microparticles as an effective means to stratify the risk of spontaneous preterm birth

Development and validation of a spontaneous preterm delivery predictor in asymptomatic women

Severe acute maternal morbidity in multiple pregnancies: a nationwide cohort study

Chorioamniotic membrane separation and preterm premature rupture of membranes complicating in utero myelomeningocele repair

Does gestational diabetes affect fetal growth and pregnancy outcome in twin pregnancies?
Fluconazole use and birth defects in the National Birth Defects Prevention Study

Perinatal and obstetric outcomes of dichorionic vs trichorionic triplet pregnancies

**BASIC SCIENCE SELECTIONS**

Increase in pro-apoptotic Bax expression and decrease in anti-apoptotic Bcl-2 expression in newborns with necrotizing enterocolitis

Differential expression of long non-coding RNAs in hyperoxia-induced bronchopulmonary dysplasia
Bao TP, Wu R, Cheng HP. Cell Biochem Funct.

Hyperoxic exposure of immature mice increases the inflammatory response to subsequent rhinovirus infection: association with danger signals
Cui TX, Maheshwer B, Hong JY. J Immunol.

A histological and immunohistochemical study of the effects of N-acetyl cysteine on retinopathy of prematurity by modifying insulin-like growth factor-1

Obesity and overweight: impact on maternal and milk microbiome and their role for infant health and nutrition
Garcia-Mantrana I & Collado MC. Mol Nutr Food Res.

Delayed introduction of parenteral phosphorus is associated with hypercalcemia in extremely preterm infants

Endogenous and exogenous stem/progenitor cells in the lung and their role in the pathogenesis and treatment of pediatric lung disease
Leibel S, Post M. Front Pediatr.

Mutations in the histone modifier prdm6 are associated with isolated nonsyndromic patent ductus arteriosus

Reduced cerebral blood flow and oxygen metabolism in extremely preterm neonates with low-grade germinal matrix-intraventricular hemorrhage
Maternal folic acid supplementation modulates DNA methylation and gene expression in the rat offspring in a gestation period-dependent and organ-specific manner

Mesenchymal stromal cells in the development and therapy of bronchopulmonary dysplasia
Möbius MA & Rüdiger M. *Mol Cell Pediatr.*

Oral supplementation of 2'-fucosyllactose during lactation improves memory and learning in rats
Oliveros E, Ramirez M, Vazquez E. *J Nutr Biochem.*

Fetal programming and early identification of newborns at high risk of free radical-mediated diseases

In vivo quantification of intraventricular hemorrhage in a neonatal piglet model using an EEG-layout based electrical impedance tomography array
Tang T, Weiss MD, Borum P. *Physiol Meas.*

Caveolin-1 regulates the expression of tight junction proteins during hyperoxia-induced pulmonary epithelial barrier breakdown
Xu S, Xue X, You K. *Respir Res.*

Hyperoxia-mediated LC3B activation contributes to the impaired transdifferentiation of type II alveolar epithelial cells (AECIIs) to type I cells (AECIs)
Zhang L, Zhao S, Yuan L. *Clin Exp Pharmacol Physiol.*

Placental growth factor (PLGF) triggers EMT-like changes in rat type II alveolar epithelial cells: activation of NFkappaB signalling pathway
Zhang L, Zhao S, Yuan L. *Basic Clin Pharmacol Toxicol.*

Improving maternal vitamin D status promotes prenatal and postnatal skeletal muscle development of pig offspring