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Posters

Ke-Ni Niko Tien et al., J Pediatr Care 2019, Volume 5
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Implementation of early-onset sepsis calculator in the newborn nursery at local community medical center in Baltimore, Maryland

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Antibiotics are the most commonly prescribed medications in the neonatal population. Early antibiotic exposure is associated with asthma, allergic reaction, autoimmune disease and obesity later in childhood. In this newborn setting, the providers most commonly refer to the 2010 CDC guideline for managing infants at risk for early-onset sepsis (EOS). However, the interpretation of the guideline varies among providers. Evidence suggests that implementing a neonatal earlyonset sepsis (EOS) calculator decreases the number of infants requiring antibiotic prophylaxis and reduces antibiotic exposure safely. The purpose of this quality improvement (QI) scholarly project was to implement the EOS calculator for infants ≥35 weeks gestational age (GA) with infection risk factors but well appearing in a newborn nursery (NBN) at an urban medical center setting in Maryland to reduce the need for laboratory evaluation and antibiotic exposure, as well as to standardize the practice. Focus-Analyze-Develop-Execute/Evaluate (FADE) was the quality improvement (QI) model used for this project. All infants born at ^{3} 35 0/7 weeks' gestation (n= 190) at the study hospital were enrolled over 11 weeks, September 9, 2018, to November 22, 2018. A retrospective chart review was also conducted to establish a baseline of comparison (n= 144). Based on the data, 174 out of 190 infants (91.6%) were managed utilizing the EOS calculator from birth to 12 hours of life. Seven out of one hundred and seventy-four infants (4%) received sepsis laboratory evaluation, compared to 25 infants out of 144 (17.3%) before the implementation. The percentage of infants needing laboratory evaluation significantly decreased with the use of the EOS calculator ($p < 0.05$). The results of this project reveal a decrease in laboratory evaluation and prophylactic antibiotic use by utilizing the EOS calculator. The significant declines suggest that continued and widespread use of the EOS calculator has a significant impact on antibiotic usage in this well newborn nursery.

Biography

Ke-Ni N Tien has been in Neonatal Clinical Practice sine 1991, having worked in Taiwan and some of the Nation's top ranked Neonatal Intensive Care Units. She currently serves as a Neonatal Nurse Practitioner (NNP) full-time with Cleveland Clinic Children's and part-time with Johns Hopkins Children's Center. He holds an earned Master of Science in Nursing at Arizona State University in 2007 and is currently a Doctoral Candidate in Nursing Practice (DNP) with the University of Maryland. Her interests concentrate on the synthesis of neonatal research, education and quality improvement projects, transforming data driven interdisciplinary team approaches into tangible improvement outcomes.

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Gayatri Athalye-Jape et al., J Pediatr Care 2019, Volume 5
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Oropharyngeal colostrum for preterm infants-a systematic review and meta-analysis

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Administration of oropharyngeal colostrum (OPC) is safe, feasible and potentially beneficial in preterm infants. We aimed to assess the effects of OPC in preterm infants. A systematic review of randomized controlled trials (RCTs) and non-RCTs of OPC administration in preterm infants was conducted. We searched MEDLINE via PubMed and Ovid, EMBASE, Cochrane Central Register of Controlled Trials, Emcare databases, proceedings of Pediatric Academic Society meetings and grey literature in April 2018. Six RCTs (N=269) and four non-RCTs (N=737) were included. One RCT (n=40) focused on enteral bovine colostrum and hence was excluded from our review. Five of the six RCTs had unclear risk of bias in many domains of assessment. Meta-analysis (random effects model) of RCT data showed no significant difference in ≥stage 2 necrotizing enterocolitis [Relative Risk (RR): 0.83; 95% CI 0.39, 1.75; P=0.62], late onset sepsis [RR: 0.78 (95%CI 0.50, 1.22) P=0.28], all-cause mortality [RR: 0.74 (95% CI 0.27, 2.06); P=0.56]; duration of hospital stay [Mean Difference (MD): -1.65 days (95% CI: -10.09, 6.80); P=0.70] and time to full feeds [MD: -2.86 days (95% CI -6.49, 0.77); P=0.12]. Meta-analysis of data from non-RCTs also showed no benefit for any of these outcomes. OPC increased secretory IgA and lactoferrin levels (four RCTs), but did not alter oral microbiome (one RCT). There were no adverse effects (e.g. aspiration) of OPC. The overall quality of evidence (GRADE analysis) was very low. Adequately powered RCTs are needed to confirm the nutritional and immunomodulatory benefits of OPC in preterm infants.

Biography

Gayatri Jape (MD, FRACP) is a consultant neonatologist at King Edward Memorial Hospital (KEMH) in Perth, Western Australia. She is a Clinical Senior Lecturer at the University of Western Australia. She has worked in Pediatrics and Neonatology since last 15 years in Australia and overseas. Dr Jape is involved in follow up of high risk preterm infants till five years of age as a part of the Neonatal Follow Up Program at KEMH. She is pursuing a PhD focussed on probiotics,nutrition and long term neurodevelopment in preterm infants. She led a randomized controlled trial on effect of single or three strain probiotic on enteral nutrition in extremely preterm infants (SiMPro, ACTRN12615000940572) which is currently in the long term follow up phase. Dr Jape has also completed her Graduate Certificate in Autism Diagnosis from UWA. She has published articles and is an international reviewer for good impact peer-reviewed journals.

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Decrease suspected sepsis work-up and empirical antibiotic use in newborns ≥35 weeks with implementing the early-onset sepsis (EOS) calculator in a newborn nursery

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Background: Antibiotics are the most commonly prescribed medications in the neonatal population throughout the country, especially in well appearing infants in the first few days of life. Many undesirable consequences have been associated with unnecessary sepsis evaluations and antibiotic exposure. In our institution, those infants who were born to mothers with chorioamnionitis diagnoses, we obtained blood work at birth including complete blood count with differential (CBC/d), blood culture and initiated empiric antibiotics. Repeated CBC/d along with C-reactive protein (CRP) was collected at twenty four hours of life. Additionally, infants who were born to mothers with prolonged rupture of membranes (PROM) also received the same laboratory evaluation without empiric antibiotics.

Methods: The Kaiser Early-Onset Sepsis (EOS) calculator was implemented on June 1, 2018 in the newborn nursery to newborns born to mothers with chorioamnionitis, PROM and preterm infants born to mothers with unknown GBS or GBS+ but inadequately treated.

Results: We have effectively decreased the antibiotic usage rate (AUR), blood work evaluations and the lengths of hospital stay since June 1, 2018. During the first three month period, our sepsis laboratory evaluation rate on asymptomatic infants with risk factors decreased from 100% to 15.7% and the empiric antibiotic use decreased from 100% to 2.9%.

Discussion: Initial challenges we encountered with planning and implementing the EOS calculator were concerns regarding a drastic practice change and the fear of missing treatment for possible sepsis. With careful interdisciplinary planning and education, ensuring proper team notification and consult for all infants at risk, usage of the EOS calculator and close follow-up, provider support gradually improved.

Biography

Ke-Ni N Tien has been in neonatal clinical practice since 1991, having worked in Taiwan and some of the nation's top ranked Neonatal Intensive Care Units. She currently serves as a Neonatal Nurse Practitioner (NNP) full-time with Cleveland Clinic Children's and part-time with Johns Hopkins Children's Center. She has completed her Master of Science in Nursing at Arizona State University in 2007 and is currently a Doctoral candidate in nursing practice (DNP) with the University of Maryland. Her interests concentrate on the synthesis of neonatal research, education and quality improvement projects, transforming data driven interdisciplinary team approaches into tangible improvement outcomes.

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Inna Yoffe Vaisman, J Pediatr Care 2019, Volume 5
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Improving the qualification of a little patient and his parents before and after surgery

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Patient-centered care (PCC) is one of the main components of the IOM (2001) Quality Therapy, which addresses quality treatment according to the IOM Report (2001). Quality treatment respects the patient and addresses the patient's preferences, needs and values, ensuring that patient values guide clinical decision-making. Preparing children for surgery reduces their anxiety level before and after surgery compared with unprepared children (Li & Lopez, 2008). The positive experience of the patient from the procedure is critical and influences the child's continued perception of his or her stay in the hospital. Therefore, it was decided to improve the pre-surgery procedure performed towards children's surgery in order to reduce the level of anxiety among children and their parents, to increase their sense of control and thereby to achieve cooperation between the child and his family.An intervention program was introduced that included age-appropriate structured instruction and a developmental stage of the "young patient".Raising awareness of the existing staff and preparing a training program for new nursing staff. Assessment of patient and family satisfaction before and after the intervention program.The intervention program contributed in a variety of ways to the general feeling of satisfaction with the preoperative process and specifically to understanding the way in which the procedure was conducted and how the information about the planned operation was offered. The implications of the intervention program are very significant, as comprehensive adjusted training, patient empowerment and empathic intervention have been shown to contribute to the sense of satisfaction and to generally improve the experience of hospitalization.

Biography

Inna Yoffe Vaisman has completed her MHA at the age of 26 years from Tel Aviv University. She is the Clinical Nurse Manager at Pediatric surgery department in Sheba Medical Center at Tel Hashomer, Israel.

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Accepted Abstracts

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Antenatal steroids-Where are we?

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Early steroids studies in fifties and sixties involved animals and the effects they had upon various organs. It was not until in 1969 when GC Liggins, while studying the effects of steroids upon the initiation of labor in fetal lambs, that he noticed the steroids treated lambs not only had initiation of labor but they also had relatively more mature lungs and better survival. This further led to studies which directly showed the effect of steroids upon maturing lungs by accelerated surfactant appearance. In 1972, landmark study by GC Liggins and RN Howie showed that steroids could reduce the incidence of RDS in preterm neonates. This study led pathway to numerous studies all over the world showing effects of steroids in maturation of lungs. However, they also showed caution regarding the potential adverse effects. In 1990, systemic review by P Crowley clearly showed the beneficial effects of steroids in reduction of RDS with minimal adverse effects. Further in 1994, consensus statement by NIH gave the current recommendation and regimen for antenatal steroids for preterm deliveries. Further consolidation of the positive effects of steroids was done by meta-analysis by D Roberts in 2000 and further in 2006. However, despite clear evidence of beneficial effects, 2014 study in Lancet showed that the use of corticosteroids in lower income countries like Nepal, Afghanistan, Niger and Congo was low. The use of antenatal steroids must be encouraged especially in lower income countries for reducing the neonatal mortality rates in these countries.

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Humidified high-flow nasal cannula versus nasal CPAP as a respiratory support in preterm infants-non inferiority randomized controlled trial in a tertiary care center

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Background: Respiratory failure in the neonatal period remains a difficult challenge and is associated with high morbidity, mortality and cost. Humidified high flow nasal cannula (HHFNC) is being increasingly used as an alternative form of respiratory support for preterm infants with apnea, respiratory distress syndrome or chronic lung disease, even though limited evidence is available to support the specific role, efficacy and safety in newborns.

Objective: To assess the indications, frequency of usage, efficacy and safety of HHHFNC as compared to nasal CPAP in providing respiratory support in preterm neonates after a period of positive pressure ventilation. (That is post extubation).

Materials & Methods: This study was conducted in a tertiary, level II b Neonatal Intensive Care Unit in North Karnataka, India. In this study, all preterm neonates less than 37 weeks of gestation were placed on one of the respiratory supports (that is HHHFNC or NCPAP), immediately following extubation from mechanical ventilation. The primary outcome measures assessed were death, days on mechanical ventilation, need for reintubation (failure), air leak, nasal injury and Bronchopulmonary dysplasia.

Results: There were no significant differences in major clinical outcomes including death, BPD, ventilator-days, NEC, severe IVH, ROP or time to full feeds. Treatment failure was seen in 12% of infants on HHHFNC compared to 16% on NCPAP (P value=0.48). No significant difference in other outcome measures seen between the groups. No nasal injury was seen in HHHFNC group against 10% in NCPAP group (P value=0.55).

Conclusion: The data presented here indicate that HHFNC may represent a well-tolerated and effective alternative respiratory support mode to NCPAP in the Preterm. High flow support appears safe to use in moderate preterm infants. Larger randomized trials are needed to find its utility in extreme preterm infants and infants with severe respiratory disease as a primary respiratory support.

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Comparative effects of bisphenol s and bisphenol a on the development of female reproductive system in rats; a neonatal exposure study

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Bisphenol A (BPA) has been well documented for its endocrine disrupting potential however, very little is known about endocrine disrupting abilities of bisphenol S (BPS). The present study aimed to compare the endocrine disrupting potentials of BPS with BPA, using female rats as an experimental animal model. On postnatal day 1 (PND 1) female pups born were randomly assigned to seven different treatments. Control group received subcutaneous injection of castor oil (50 µL) from PND 1 to PND 10. Three groups of female pups were injected subcutaneously with different concentrations (0.5, 5 and 50 mg/kg in 50 µL castor oil) of BPS, while remaining three groups were treated with 0.5, 5 and 50 mg/kg BPA. Highest doses treatments of both compounds resulted in delayed puberty onset and altered estrous cyclicity. Final body weight was significantly high in the highest dose treated groups of both BPS and BPA. Gonad somatic index, absolute and relative weight of uteri was significantly reduced in BPS (5 and 50 mg/kg) and BPA (5 and 50 mg/kg) treated groups than control. Plasma concentrations of testosterone and estradiol were significantly increased, while plasma progesterone, luteinizing hormone (LH) and follicle stimulating hormone (FSH) concentrations were significantly reduced in highest doses treated groups. Dose dependent increase in the number of cystic follicles in the ovaries was evident along with an increase in the number of atratic follicles. The results suggest that neonatal exposure to higher concentrations of BPS can lead to BPA like structural and endocrine alterations in female rats.

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The case Bartter Syndrome with novel mutation in CLCNKB gene

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The female child of Chinese origin was born of a non-consanguineous marriage, SVD, premature with the birth weight of 1450 g, as the elder amongst the twins of test-tube pregnancy to a G1P2 mother at 29+4 weeks of gestation. The Apgar score was 9 at 1st min and 10 at 5th min. At the age of 8-months the child who had already been treated indoor, three times before, for repeated infections and malnutrition, presented to the hospital for 10 days of anorexia. The child appeared severely malnourished weighing 5 kg only. She had low urine specific gravity <1.005), metabolic alkalosis (serum bicarbonate 29 mmol/l, pH 7.67, BE=9 mmol/L), hyponatremia (Na 136.9 mmol/L), hypocalcemia (Ca 1.44 mmol/L), hypokalemia (2.96 mmol/ L), and hypochloremia (CL 86.50 mmol/L). With the above-mentioned findings, she was clinically diagnosed as BS type III. The polymerase chain reaction (PCR) for amplifying DNA sequences and direct sequencing of all the exons of CLCKB gene was performed using peripheral blood genomic DNA. All the primers were designed according to the sequence of NG_013079.1. The sample was analyzed for CLCNKB gene showed homozygous mutation: c.655+2 T>A (coding region 655+2 nucleotide thymine to adenine), resulting in amino acid splicing mutation. The present study has found a novel mutation, including one already reported SNP, which would enrich the human gene mutation database (HGMD) and provide valuable references to the genetic counseling and diagnosis.

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A study on the neurodevelopment outcomes of late preterm infants

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Introduction: The study is intended to fill the knowledge gap about the neuropsychology and neuro motor developmental outcomes and identify the perinatal risk factors for late preterm infants (LPIs 34~36 weeks GA) born with uncomplicated vaginal birth at the age of 24 to 30 months.

Methods: The parents/guardians of 102 LPIs and 153 term infants, from 14 community health centers participated in this study. The Modified Checklist for Autism in Toddlers (M-CHAT) questionnaire, the Chinese version of Gesell Development Diagnosis Scale (GDDS) and the Sensory Integration Schedule (SIS), a neurological examination for motor disorders (MD) were carried out. Infants screening positive to the M-CHAT were referred to specialist autism clinics.

Results: 46 LPIs (45.1%) scored low in GDDS. 9 LPIs (8.8%) scored positive on M-Chat. 8.8% of LPIs (9 out of 102) were diagnosed MD ($p<0.05$). LPIs had statistically lower scores in GDDS and the Child Sensory Integration Checklist. LPIs that had positive results on M-CHAT showed unbalanced abilities in every part of GDDS. Risk factors of twin pregnancies, pregnancy induced hypertension and premature rupture of membranes had negative correlation with GDDS (all $p<0.05$). Birth weight and gestational age were positively correlated with GDDS.

Conclusions: LPIs shall be given special attention as compared to normal deliveries, as they are at increased risk of neurodevelopment impairment, despite being born with no major problems. Some perinatal factors such as twin pregnancies and pregnancy induced hypertension etc. have negative effects on their neurodevelopment. Regular neurodevelopmental follow-up and early intervention can prove beneficial.

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Using a regional approach of a network of facilities to address mortality due to prematurity: Lessons from Eastern Uganda

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Complications due to prematurity and low birth weight babies are considered as the leading cause of neonatal mortality worldwide. In Uganda, prematurity contributes to a third of neonatal deaths and 40% of under-five mortality. We developed an intervention, the Preterm Birth Initiative (PTBi), to test a model for addressing preterm care at scale within the Uganda health system. Since January 2016, we implemented the PTBi in a regional network of six hospitals in Eastern Uganda, utilizing the simulation based training and mentorship in intrapartum and immediate postnatal care, use of modified WHO safe childbirth checklist, Plan, Do, Study, Act (PDSA) cycles, and data strengthening. The findings show that use of a network of hospitals at the same time has led to improved communication among facility leaders and health providers. In addition, health workers learn faster together and are able to access specialists at the regional level hospital whom they consult by phone on management of sick and high risk newborns, or give pre-referral treatment and refer. This approach has streamlined the referral of not only preterm babies but also for all other newborns and women in labor for better outcomes. Consequently, the preterm mortality reduced from 8.1 to 5.3/1000 live births in 18 months. The overall providers' knowledge scores improved from 48% to 70% in the pre and post-training tests respectively. A regional approach of network of facilities can enhance scale up of preterm care and accelerate reduction in neonatal mortality in the country and similar settings.

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Experience of tracheoesophageal fistula in neonates in a tertiary care centre-retrospective study

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Introduction: Tracheoesophageal fistula is one of the most common neonatal emergencies. The most common presentation being polyhydramnios detected antenatally, excessive salivation and vomiting, respiratory distress after birth, recurrent pneumonia later in life. The incidence is 1 in 3000 to 1 in 4500 live births.

Clinical profile: Out of 1206 admissions in 2017-2108 to NICU, fifty required surgery. Out of which eleven babies were diagnosed with tracheo-esophaegal fistula and were subjected to surgery. Antenatal scans revealed polyhydramnios in four babies. Nine babies were born at term with average weight of 2-2.5 kg and two babies were born preterm at thirty weeks (1.3kg) and thirty two weeks (1.8kg). Eight babies presented on day 1-2 of life and three babies on day 2-3. Most common clinical presentation was excessive frothing from the mouth noticed since birth and respiratory distress. Nine babies (82%) presented with chest infection of varying severity. Only two babies (18%) had clear chest. Babies were stabilized in NICU and connected to Replogle tube with continuous negative suction. All babies were subjected to surgery within twenty four hours of admission. Type C was the most common. Babies were subjected to contrast study to rule out anastomotic leak. Feeding initiated after seventy hours hours of life and was gradually started on trophic feeds and reached full feeds.

Outcome: Out of eleven babies, nine babies recovered and were discharged. One baby was discharged against medical advice and one baby died due to sepsis. Growth is satisfactory and development has been normal at one year of age in all discharged babies at follow up.

Discussion: Success in survival of neonate with tracheo-esophageal fistula is attributed to improved neonatal intensive care with surgical advances and postoperative care. Early recognition, prompt and efficient management of the cases was possible due to multidisciplinary approach by neonatologist, intensivist and the surgeon.

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Maternal nutrition and birth weight: Role of vitamins and trace elements

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Pregnancy is a period of increased metabolic needs. Vitamins, minerals and trace elements are major determinants of the health of the pregnant woman and the fetus. To evaluate maternal intakes of vitamins and trace elements in the first, second and third trimesters of pregnancy and assess their effect on birth weight. A prospective and longitudinal study have been conducted among 226 pregnant women throughout the whole period of pregnancy in the centers of prenatal consultations and follow up in Constantine (Algeria) from December 2013 to June 2016. We analyzed maternal intakes of iron, minerals and vitamins by comparing them to the normally recommended dietary allowances (ANC) and then by multivariate analysis, we studied the correlation between these intakes and birth weight. Statistics were performed using the Statview TM and SPSS software. This study noted the positive effect of some maternal factors on birth weight, such as maternal age, parity, pre-pregnancy BMI and pregnancy term. The average daily intake of minerals (iron, calcium, zinc and magnesium) and vitamins (B9, B1 and E) were below the ANC. In contrast, average intakes of vitamin C in the 2nd and 3rd trimesters of pregnancy corresponded to the ANC. Only magnesium intakes in the first trimester (p=0.02) and vitamin B9 in third one (p=0.004) were significantly correlated with birth weight. Intakes of trace elements and vitamins in our study population are reduced compared to the ANC. The correction of the pregnant women diet is urgently needed.

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Twenty three and twenty four weeks gestation. Mortality predictive risk factors of limits of viability preterm infants

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A population-based, retrospective cohort study of infants born at 23 and 24 weeks gestation age over two and half years period. A hundred and five preterm infants were investigated during the period of the study, 60 infants born at 23 weeks gestation and 45 infants born at 24 weeks gestation. Those admitted to the NICU were 79 infants (75%). Infants died within the first 2 weeks of life were 26 (32%), those died beyond 2 weeks of life were 12 (16%). Alive infants till discharge were 41 (53%) of the total NICU admitted infants. Deaths before discharge occurred in 48.1% (64% and 33%). The survival rate for infants admitted to the NICU was 35% and 62% in 23 and 24 weeks infants respectively.

For those infants died ≤ two weeks of life the most associated risk factors were; Lack of maternal antibiotics (OR=8.9 and 1.13), no antenatal steroids (OR=13 and 2), bruises (OR 7.7 and 1.5), gelatinous skin (OR=2.2 and 6), fused eyes (OR= 1.4 and 7).

Failure to extubate from respirator by 2 weeks of age while FIO2 requirement > 50% was a main risk factor associated with death beyond 2 weeks of life.

In comparison to mothers who did not receive antenatal steroids, incomplete course showed significant but lower risk of mortality. (OR=3 vs 13)

Conclusions: Antenatal steroids, the degree of immaturity, birth weight less than 750 grams, need for IPPV ventilation while require more than 50% FIO2 at 2 weeks of age were among the most events associated with death.

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