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Because jaundice can translate to big risk for newborns

Each year, more than 800,000 newborns in the United States are diagnosed with neonatal jaundice.1 Some babies may not fully respond to current therapies and may require additional interventions, leaving them exposed to elevated levels of bilirubin for a long duration of time.2 It is unknown what levels of bilirubin start to trigger potentially toxic effects in an individual newborn. Left uncontrolled, elevated bilirubin can lead to neurologic dysfunction, encephalopathy, or irreversible brain damage.3,4

In 2004, the American Academy of Pediatrics published guidelines for the management of hyperbilirubinemia.3 Since then, there have been only modest treatment advancements in jaundice. The current standard of care requires periods of isolation that can compromise the potential of the mother-infant bond.5 Mallinckrodt is committed to researching and advancing the understanding of neonatal jaundice.


Visit SeeJaundiceDifferently.com to sign up for further updates.
Clinical Outcome of Complete Integration of Electronic Health Record System Technologies Inside the Neonatal Intensive Care Unit - Four 4-Year Evaluation

By Husam Salama, MD; Sufwan Alomar, MD; Hilal Al.Rifai, MD; Samawal Lutfi, MD; Cindhu Jacob, MD; George Jacob, MD; Afaf Shedad, MD; Tawa Olukade, MD

Introduction

Objectives: To evaluate the impact of a complete transformation of patient medical records from the traditional paper-based system to an electronic, computerized-based system on the clinical outcomes of newborn infants admitted to NICU.

Abbreviations: CLD: Chronic Lung Disease; CONS: Coagulase Negative Staph; CLABSI: Central Line-Associated Blood Stream Infection; EHRs: Electronic Health Record System; IVH: Intraventricular Hemorrhage; LOS: Late Onset Sepsis; NEC: Necrotizing Enterocolitis, ROP: Retinopathy of Prematurity; VLBW: Very Low Birth Weight; VAP: Ventilation Associated Pneumonia; ALOSMV: Average Length of Stay on Mechanical Ventilation, ALOS: Average Length of Stay in ICU; NICU: Neonatal Intensive Care Unit; ELBW: Extremely Low Birth Weight, EMR: Electronic Medical Records.

Key Words: NICU, Electronic Data entry, Cerner, clinical outcome, quality, health record, EHRs.

Acknowledgment: The authors would acknowledge the valuable work of the NICU Database, Women’s Hospital at Hamad Medical Corporation.

Abstract

Objectives

To evaluate the impact of a complete transformation of patient medical records from the traditional paper-based system to an electronic, computerized-based system on the clinical outcomes of newborn infants admitted to NICU.

Methods

This is a retrospective observational comparative analysis of nine major neonatal clinical parameters. The study compared the outcomes of two eras, two years before and two years after implementing the new Electronic Health Record System (Cerner®) into a major tertiary NICU. The study focused on the following nine patient outcomes: mortality rate, infection rate, chronic lung disease, pneumothorax, brain hemorrhage, Retinopathy of Prematurity, necrotizing enterocolitis, Average Length of Stay inside the NICU, and the average number of days on mechanical ventilation. The data was collected to present three sets of results; general outcome of all newborns, outcomes of newborns less than 1500 grams birth weight and outcomes related to newborn infants born between 23 to 29 weeks gestation age.

Results

A total of 3,394 newborns admitted to NICU in pre-EHR era (2014 and 2015) was compared to 3,834 newborns admitted during post-EHR era (2015 and 2016), after exclusion of deaths occurred at the delivery room setting. Overall mortality rate was 4.45% versus 3.9% with a P-value of 0.003. An increase in the rate of CLD from 5.85% to 9.7% with a P-value of 0.011. A decrease in rate of pneumothorax was noted; 2.64% versus 2.45% with a P-value of 0.008. Mortality rate among VLBW increased from 15.9% vs 17.7%. Among babies born less than 1500 grams, the rate of necrotizing enterocolitis and cystic periventricular leukomalacia, was not significantly affected between the two eras. The Retinopathy of Prematurity rate was significantly reduced from 28% to 26% with a P-value of 0.0045. In the Extreme Low Birth Weight group, there was a decrease in the mortality rate from 23% to 18.6% with a P-value of 0.268, and an increase in CLD. However, infection control data showed marginal improvement, where CLABSI was 3.8% vs 3% with a P-value of 0.7, VAP 2.1% vs 1.6% with a P-value of 0.08, and CONS infection 2.1 vs 0.93% with a P-value of 0.03.

Conclusion

Complete transformation into EHRs was not accompanied with significant improvement in clinical outcomes in newborn infants admitted to the NICU. Health care policy makers may consider goals other than patient clinical outcome when they plan to implement the EHRs.

Introduction

The comprehensive transfer of medical records from a paper-based system to a computer-based system is sweeping medical practice in both governmental and private healthcare institutes. The main reasons are: to guarantee a safe place for patient documents, easy follow-up of patient records, adding more patient data that were not routinely recorded by health care givers, protection of patient records from illegal changes that may have medico legal implications and its role in research and auditing services. However, there has been resistance toward accepting the electronic medical records by healthcare givers due to several genuine reasons including: longer time to enter the data, needs for extensive computer literacy, high cost, inefficiency, data entry errors, linking the electronic performance with the overall staff performance evaluation and less time spent on patient care. Other similar studies reported the use of EHRs inside the NICU to improve work flow, auditing purposes and generating of annual statistics. However, there was no emphasis on clinical outcome of newborn infants after the introduction of the EHR system.

One of the major USA (EHRs) institutes endorsed its services for many reasons, non-including data from morbidity and
mortality among sick newborn babies inside the NICU.8

Virtually all studies, reviewed articles and published auditing results evaluating such systems inside the NICU did focus on the technical, logistic and/or fiscal impact on health care service.6-9

In this study, the authors are exploring the clinical impact of such modern technology on newborn morbidity and mortality inside the neonatal intensive care.

During 2013-2016 study period, four significant developments occurred inside our NICU; namely, on January 2014, the wide use of non-invasive ventilation through introducing new advanced ventilators, adding 35 more new beds in a new NICU expansion, creating a special NICU mainly dedicated to caring for Extreme Low Birth Weight babies born at 23 to 27 weeks gestation age, and the introduction of Cerner® Electronic Health Record System. Cerner® Electronic Patient Registry was introduced to our institute in November 2014. Starting from January 2015, paper-based patient record were removed entirely from patient area, and were completely replaced by the EHRs.

Aims and Objectives

To estimate differences in mortality, major morbidity rates and key performance indicators inside NICU, namely, rate of CLABSI, VAP, days on Ventilator and hospital stay before and after introduction of EHRs.

Methodology

This was a retrospective cohort study comparing the outcomes of two eras, two years before and two years after total implementation of a new electronic medical record system (Cerner®) within state-run hospitals in Qatar. The study focused on nine patient outcomes: mortality rate, infection rate, Chronic Lung Disease, pneumothorax, brain hemorrhage, Retinopathy of Prematurity, necrotizing enterocolitis, Average Length of Stay in the NICU, and the Length of Stay on Mechanical Ventilation among all newborns admitted into the NICU within the studied periods. The data was collected to present three sets of results: general outcome of all newborns, outcome of newborns less than 1500 grams birth weight, and outcomes of newborn infants born at 22 to 29 weeks gestation age.

The data was retrieved from both our NICU, the Vermont Oxford Database and the Women’s Hospital Medical Record Electronic Database. All newborns admitted into the NICU were eligible for study. The total sample size was 7,228 for the two periods, (2014 and 2015, n=3,394) and (2015 and 2016, n=3,834).

Statistical Calculation

The prevalence of outcomes was calculated and presented as absolute percentages. Length of days was expressed as means and standard deviation. The rates of nosocomial infections was calculated as number of cases divided by the number of patient days x 1000. Chi-square test for comparison of differences in proportions between the two periods was done using Medcalc’s online ‘Free statistical calculators’, which “uses the “N-1” Chi-squared test as recommended by Campbell (2007) and Richardson (2011)”.11 Calculation was done using the sample proportions (%) and the sample sizes of the two periods being tested. Statistical significance was set at p<0.05. Medcalc.org comparison of means was used to compare the days of hospital stay and days of mechanical ventilation using student t-test.11

Results

A total of 3,394 newborns admitted to the NICU during the pre-EHR era (2014 and 2015) was compared to 3,834 newborns admitted during post-era (2015 and 2016) after exclusion of deaths occurred at the delivery room setting (Table 1). The overall mortality rate was 4.45% versus 3.9%, with a P-value of 0.003. There was an increase in the rate of CLD from 5.85% to 9.7%, with a P-value of 0.011. A decrease in the rate of pneumothorax was noted; 2.64% versus 2.45% with a P-value of 0.008. The mortality rate

### Table 1: Clinical Outcome of All Infants Born at Women’s Hospital During the Study Period

<table>
<thead>
<tr>
<th></th>
<th>2013-2014 (3,394)</th>
<th>2015-2016 (3,834)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>4.45</td>
<td>3.9</td>
<td>0.003</td>
</tr>
<tr>
<td>CLD</td>
<td>5.85</td>
<td>9.7</td>
<td>0.011</td>
</tr>
<tr>
<td>Pneumothorax</td>
<td>2.65</td>
<td>2.45</td>
<td>0.008</td>
</tr>
<tr>
<td>IVH</td>
<td>8.45</td>
<td>11.1</td>
<td>0.070</td>
</tr>
<tr>
<td>ROP</td>
<td>23.6</td>
<td>23</td>
<td>0.696</td>
</tr>
<tr>
<td>Cystic PVL</td>
<td>1.75</td>
<td>2</td>
<td>0.170</td>
</tr>
<tr>
<td>NEC</td>
<td>1.5</td>
<td>1.25</td>
<td>0.073</td>
</tr>
<tr>
<td>Average Length of Stay in NICU</td>
<td>16.1±37</td>
<td>16.3±28</td>
<td>0.79</td>
</tr>
<tr>
<td>Average Length of Stay on Ventilation</td>
<td>6.2±18</td>
<td>6.7±16</td>
<td>0.21</td>
</tr>
</tbody>
</table>

### Table 2. Clinical Outcome of Infants Born Less Than 1,500 Grams Women’s Hospital During the Study Period

<table>
<thead>
<tr>
<th></th>
<th>2013-2014 (547)</th>
<th>2015-2016 (667)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>16.7</td>
<td>14</td>
<td>0.027</td>
</tr>
<tr>
<td>CLD</td>
<td>8.2</td>
<td>14.1</td>
<td>0.013</td>
</tr>
<tr>
<td>Pneumothorax</td>
<td>4.2</td>
<td>4.4</td>
<td>0.28</td>
</tr>
<tr>
<td>Late Onset Bacterial Sepsis</td>
<td>16.3</td>
<td>15.6</td>
<td>0.64</td>
</tr>
<tr>
<td>CONS</td>
<td>6.1</td>
<td>7.4</td>
<td>0.32</td>
</tr>
<tr>
<td>IVH</td>
<td>15.3</td>
<td>16.3</td>
<td>0.49</td>
</tr>
<tr>
<td>ROP</td>
<td>28</td>
<td>26</td>
<td>0.0045</td>
</tr>
<tr>
<td>Cystic PVL</td>
<td>2.1</td>
<td>3.2</td>
<td>0.07</td>
</tr>
<tr>
<td>NEC</td>
<td>6.6</td>
<td>5.1</td>
<td>0.20</td>
</tr>
<tr>
<td>Average Length of Stay in NICU</td>
<td>47.7±53</td>
<td>43±37</td>
<td>0.069</td>
</tr>
</tbody>
</table>

For a complete table refer to the original article.
among VLBW decreased from 16.7% in pre-EHR era to 14% in post-EHR era. Among babies born less than 1,500 grams, rates of necrotizing enterocolitis and cystic periventricular leukomalacia, were not significantly affected (Table 2). Retinopathy of Prematurity rate was significantly reduced from 28% to 26%, with a P-value of 0.0045. In the Extreme Low Birth Weight group, there was a decrease in mortality rate from 23% to 18.6% with a P-value of 0.0268, and an increase in CLD rate (Table 3). However, infection control data showed improvement where CLABSI was 3.8% vs 3%, with a P-value of 0.7, VAP 2.1% vs 1.6%, with a P-value of 0.08, and CONS infection 2.1 vs 0.93%, with a P-value of 0.03 (Table 4).

Discussion

Several studies have been conducted in ambulatory services and less intensive areas, assessing the information flow and logistics of electronic health care records on the quality of work performance.12,13 These studies claimed that the patient-related outcomes were better in adult patients, with enhanced overall patient care, less ordered medications and lab requests. Cordero et al demonstrated the advantage of remote

“Based on the available literature,12,13 longer duration assessment is not an impact factor. In a cross-sectional study, Li Zhou et al, found no association between duration of using an EHR and improved performance with respect to quality of care. Intensifying the use of key EHR features, such as clinical decision support, may be needed to realize quality improvement from EHRs”

The National Urea Cycle Disorders Foundation

The NUCDF is a non-profit organization dedicated to the identification, treatment and cure of urea cycle disorders. NUCDF is a nationally-recognized resource of information and education for families and healthcare professionals.
access, more panoramas of patient lab results, improvement in deciding the needs for more investigations and more physician workflow. In a cross-sectional study measuring the relationship between Electronic Health Record use and the quality of care delivered in ambulatory care practices, and how it varied according to duration of Electronic Health Record availability, the study compared the quality of care for 596 patients at the center using Electronic Medical Records for more than a decade to a national sample of 996 patients treated at community hospitals, and found that the EHRs were associated with higher levels of overall patient care quality, especially in chronic disease management and preventative care, but not in acute care areas. Few studies could be identified in high intensity areas including Neonatal Intensive Care Units. However, virtually no study assessed the exact morbidities and mortality rate after implementing EHR, which is the ultimate objective of any healthcare development. There is a clear need for studies that reflect the impact of such technology advancements on direct patient outcome parameters, rather than developments surrounding sick newborn logistic and fiscal performance. The reason why there is a need for such studies is the high incidence of morbidities inside the NICU, and the long-term impact they have on the quality of life of NICU graduates.

Based on the available literature, longer duration assessment is not an impact factor. In a cross-sectional study, Li Zhou et al, found no association between duration of using an EHR and improved performance with respect to quality of care. Intensifying the use of key EHR features, such as clinical decision support, may be needed to realize quality improvement from EHRs.

One should acknowledge the dramatic improvement in the rate of infection when comparing the two eras.

In the current study, we observed an improvement in mortality rates, pneumothorax, ROP, and infection control parameters; such improvement was secondary to adopting more non-invasive respiratory care in the premature age group, strict guidelines regarding oxygen saturation level and early application of non-invasive ventilation. However, there was a retreat in CLD, IVH and PVL, which can be explained by more premature babies less than 25 weeks being admitted to NICU. There was no change in rate of NEC, LOS and ALOSIV.

The authors of this current study can claim that clinical comparison between the two eras is unique in the literature, and no similar studies are available reflecting NICU different clinical outcomes in response to such changes. Nevertheless, we cannot exclusively link or associate our NICU outcome solely on the EHRs application. Within the capacity of this study, the authors can conclude that introducing EHRs to our NICU facility did not demonstrate a momentous improvement in morbidity and/or mortality rates inside our NICU. Healthcare policy makers are required to consider clinical outcomes when they endorse complete integration of EHRs.

Study limitation

Other factors that could possibly confound the outcomes observed in the two eras being compared were not controlled for in the analysis. As well, logistic regression of the variables was not possible as the data was retrieved from Vermont Oxford Database results concerning our hospital.

References

2. Yu Pl, Zhang Y, Gong Y, Zhang J. Unintended adverse consequences of...
Our Story PediNotes

Steve Spedale, MD, FAAP, is the director of neonatology for one of the country’s largest women’s hospitals. As an early adopter of electronic medical records in the NICU, Spedale recognized the need for improved technology not provided by the available EMRs. With that in mind, he began developing software add-ons independently to give him the tools he needed.

In 2011, Dr. Spedale realized his ideas could benefit other doctors and caregivers, so he built a development team to execute them. Together, they created PediNotes.

The technology received its first certification for meaningful use in 2013. PediNotes is anchored by the principle that once data is obtained, it should be readily available to anyone involved in the care of the patient. Focusing on the end user’s experience to maximize efficiency, PediNotes provides an intuitive approach that helps you take better care of your patients.

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Please check the for more information: http://TheBrettTashmanFoundation.org
Dear Colleagues:

The National Coalition for Infant Health (NCFIH) - applauds the development of nutritional guidelines for preterm infants by the American Academy of Pediatrics (AAP Section on Breastfeeding), the National Perinatal Association (NPA) and the Association of Women’s Health, Obstetric and Neonatal Nurses (AWHONN). Evidence-based guidelines must be constructed in a manner that reflects the overwhelming body of evidence to establish exclusive human milk for very low birthweight babies as our nation’s standard of care.

NCFIH (http://www.infanthealth.org) is collaborative of 150 professional, clinical, community health, and family support organizations focused on improving the lives of preterm infants from birth through age two. NCFIH’s values include:

Safety - Premature infants are born vulnerable. Products, treatments and related public policies should prioritize these fragile infants’ safety.

Access - Budget-driven health care policies should not preclude premature infants’ access to preventative or necessary therapies.

Nutrition - Proper nutrition and full access to health care keep premature infants healthy after discharge from the NICU.

Equity - Prematurity and related vulnerabilities disproportionately impact minority and economically disadvantaged families. Restrictions on care and treatment should not worsen inherent disparities.

Based on evidenced-based research, evaluation of all relevant data along with the practical collective clinical expertise of our members, NCFIH advocates for:

1. Access to an exclusive human milk diet for premature infants born at less than 1,250 grams.
2. Increased emotional support resources for parents and caregivers suffering from PTSD/PPD.
3. Access to RSV preventive treatment for all premature infants as indicated on the FDA approved label.
5. Safe, accurate medical devices and products designed for the special needs of NICU patients and other medically fragile infants.

For preterm infants born at less than 1,250 grams, the evidence for the use of an exclusively human milk diet devoid of foreign protein is conclusive.

Moreover, the definition of an exclusive human milk diet is exactly that: mom’s milk and/or screened and pasteurized human donor milk plus a human milk-based fortifier.

NCFIH has evaluated 15 studies published since 2010 in major journals that examine the difference between feeding bovine vs. human milk in this small cohort. Thirteen of these studies were used in our analysis; two were outside of the scope of this review.

Importantly, two randomized head-to-head trials compared the difference between an exclusive human milk diet and a diet that included bovine-based formula and/or fortifier with a total of 260 infants. 1,3

The results of both studies demonstrated clinical and statistically important differences as indicated below. Moreover, when these studies were combined, as they had initially been designed to be, the findings were more conclusive, indicating a clear and direct relationship between the amount of exposure to bovine-based nutrition and an increased risk of significant morbidities of prematurity such as necrotizing enterocolitis and sepsis. 7

These studies demonstrate:

1. Significant reductions in the incidence of all NEC and in the risk of surgical NEC 1,2,3,8,9,10,11,12
2. Decreased lengths of hospital stay 2,9
3. Reduction of TPN days 3,4
4. Reduced days of feeding intolerance and number of days to full feeds 2
5. Improved weight and length velocity with the proper feeding protocol and the use of a human milk-based fortifier 5,6
6. Lower mortality 7,8
7. Reduced incidence of late onset sepsis 2,8
8. Reduced incidence of ROP and BPD 2,8

Considering the evidence, introducing bovine milk-based substances in these infants is detrimental. A prerequisite of additional randomized controlled studies is equipoise. Further head-to-head trials utilizing bovine fortifiers and/or formula vs. exclusive human milk may be difficult to conduct in certain populations where the benefit of an exclusive human milk has been shown to be unequivocally superior.

Incremental costs of co-morbidities and interventions in these fragile infants can substantially increase the cost of NICU hospitalization. Aggregate costs include: 2,10

- Surgical NEC $198,040
- Medical NEC $74,004
- Late onset sepsis $10,055
- BPD $31,565
- ROP requiring surgery $35,749
- PDA $49,457

In addition to the aggregate costs noted above, an additional significant cost related to these infants may be the cost of total parenteral nutrition estimated at up to $1,436 per day. 13

Thus, despite the added cost of donor milk and human milk-derived fortifier, an exclusive human milk diet in very low birthweight babies is cost-effective. 2,10
A single-center retrospective study compared the benefits and costs of an exclusive human milk diet in infants less than or equal to 28 weeks gestation and or less than or equal to 1,500 grams vs. a combination of mother’s milk fortified with cow milk-based fortifier and formula, or a diet of formula only. Primary outcomes were length of stay, feeding intolerance and time to full feeds. Secondary outcomes included the effect of the diet on the incidence of NEC and the cost-effectiveness of an exclusive human milk diet.

In those babies fed an exclusive human milk diet, there was a minimum of 4.5 fewer additional days of hospitalization resulting in $15,750 savings per day, 9 fewer days on TPN, up to $12,924 savings per infant and a reduction in medical and surgical NEC resulting in an average savings per infant of $8,167. And for those parents who get to take their baby home sooner, the impact is simply priceless.

Although every effort is made to start feeding as soon as possible, good nutrition is essential, even if the baby is unable to be fed. It is key that early nutrition incorporates aggressive supplementation of calories, protein and essential fatty acids. Without these in the right balance, the body goes into starvation mode; and before feeding even begins, the intestine, the liver and other parts of the body are compromised. While an exclusively human diet with an exclusively human milk-based fortifier will minimize the number of TPN days, TPN is essential to the early nutrition of an at-risk baby and is a predicate of good feeding success.

Appropriate growth begins with a standardized and validated (and adequately labelled) donor milk with a minimum of 20 Cal per ounce.

Adding human milk-based fortification and cream has been proven to enhance growth without compromising infant health through the introduction of bovine-based fortification.6

Indeed, even small amounts of bovine products added to human milk were shown to be detrimental with a dose-response relationship suggesting increased amounts of bovine products lead to worse outcomes.2,7

An exclusive human milk diet is essential “medicine” for VLBW premature infants and we all agree fortification is required for proper growth. If we also agree to the former, utilizing a non-human fortifier or any other foreign additives in this population cannot be part of the conversation.

NCIHF welcomes the opportunity to discuss the forthcoming guidelines in person or via phone. Mitchell Goldstein, Medical Director for the National Coalition for Infant Health can be reached at 818-730-9303.

Sincerely,

Mitchell Goldstein, MD
Medical Director,
National Coalition for Infant Health

References
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“Ian exclusive human milk diet is essential “medicine” for VLBW premature infants and we all agree fortification is required for proper growth. If we also agree to the former, utilizing a non-human fortifier or any other foreign additives in this population cannot be part of the conversation.”

NT

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NEONATOLOGY TODAY at its Twitter account: @NeoToday

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9 out of 10 newborn infants are born without the beneficial bacteria needed to prevent dysbiosis.

Consequences of dysbiosis may present as colic, fussiness, gas and spit-up, and may lead to the future development of eczema, allergies, obesity and diabetes.¹

Evivo is a clinically proven strain of protective bifidobacteria. In a landmark clinical trial, infants fed Evivo had:¹

- 80% reduction in potentially harmful bacteria (such as E. coli, Clostridium, Staphylococcus and Streptococcus)
- 79% increase in beneficial bifidobacteria
- 4x lower endotoxin levels, a major driver of inflammation

Protect them. Recommend Evivo.

Twenty-Two Weeks: To Do or Not to Do?

By Shabih Manzar, MD

Summary

Infants born at perivable gestation, 22/7-23/7, are a challenge for the neonatal team. A plethora of controversial reports surround the recommendation on resuscitating these extreme preterm infants. We present a case which highlights on this controversy. The take home message is the paradigm shift in the limit of viability: 22 weeks is the new 24 weeks gestation.

Case

A perivable male infant was born to a 28 year old gravida 2, para 1 lady. She was brought to the delivery suite by the emergency medical team. The presenting complaints were abdominal pain and bleeding per vaginam. Her expected date of conception (EDC) corresponds to 22 3/7 weeks gestation. All antenatal labs including HIV, Hepatitis B, and rapid plasma reagin were negative. There was no history of any sexually transmitted diseases. On examination, she was fully dilated, and blood was noted in the vagina. Within minutes of admission, she spontaneously delivered the infant. The infant was placed on warmer. The heart rate was 20 beats per minute. On examination, the eyes were fused and infant had gelatinous skin. Birth weight was 400 grams. After consultation with mother, a decision of proving comfort care was made. The infant died within 20 minutes of birth. Bereavement services were offered. Later, the Obstetrician reported 80% placental abruption.

Discussion

Intervention decision to resuscitate at 22 weeks of gestation is a dilemma. Increasing survival has been reported in recent years. However, survival reports vary between hospitals. A report from Australia showed 5% of live births survived at 22 weeks, 46% at 23 weeks and 77% at 24 weeks. The National Institute of Child Health and Human Development (NICHD) website depicts survival calculator for these extreme premature infants. The lowest weight cutoff used is 401 grams.

Basing of variable survival statistics, the question is: should we resuscitate these babies and if we do how aggressive we should be? The American College of Obstetricians and Gynecologists (ACOG) and Society for Maternal-Fetal Medicine (SMFM) does not recommend neonatal resuscitation below 22 weeks gestation. American Academy of Pediatrics (AAP) looks at other factors in addition to gestational age alone in recommending intervention. AAP suggests that a decision regarding resuscitation should be well-communicated and agreed on before birth, wait-and-see approach is not advisable. For infants less than 22 weeks gestation, AAP recommends comfort care. Hence, the decision to resuscitate babies born between 22/7 and 23/7 weeks remains a grey area.

As these extremely premature babies are at risk of high mortality, accounting these as live births potentially increases the incidence of neonatal mortality (NM). As noted in the case presented that baby had a heart rate at birth but was very immature to provide any resuscitation. AAP defines all live birth as: “the complete expulsion or extraction from the mother of a product of human conception, irrespective of the duration of pregnancy, which, after such expulsion or extraction, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, regardless of whether the umbilical cord has been cut or the placenta is attached. Heartbeats are to be distinguished from transient cardiac contractions; respirations are to be distinguished from fleeting respiratory efforts or gasps.”

Basing on this the death of this 22 3/7 week baby is accounted as Neonatal mortality.

The report highlights that neonatal care providers should be conscious about the changing paradigm: 22 weeks is the new 24 weeks. An institutional policy is highly suggested in caring for these extreme premature infants.

References


Further Reading


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The National Perinatal Association at The 31st Annual Gravens Conference on the Environment of Care for High Risk Newborns

By Cheryl A. Milford, EdS

The National Perinatal Association (NPA) board and members were honored to present their current work on education and advocacy at the 31st Annual Gravens Conference on the Environment of Care for High Risk Newborns. The focus of this year’s Gravens Conference was “Social and Emotional Health of Babies, Families, and Staff,” a topic of great interest to NPA as demonstrated in several recent projects and work products. NPA is a 40-year-old organization that was founded, in part, by Stanley Gravens, MD who was the first President of NPA.

The week in Clearwater Beach began with an NPA NICU Psychologists Retreat on Tuesday, February 26th, 2018. Twenty NICU psychologists from around the country met for a full day of discussion about the role of the psychologist in the NICU, the training and competencies required, how to advocate and promote psychological services in the NICU and encouraging research on the efficacy of NICU psychologists in meeting the mental health needs of families and staff. The group learned about the implementation of intern and post-doc fellowships in NICU psychology at UCLA and Stanford. Fellows from both programs presented information about their experiences and the ongoing recruitment of interns and fellows for each institution. The group concluded its day by developing goals and objectives for moving forward in each area of interest and creating timelines for development of materials for publication.

Opening day of the Gravens Conference was Wednesday, February 28th and on Thursday, March 1st, Mike Hynan, PhD (NPA member and former Board member), Sue Hall, MD and Raylene Phillips, MD (both current NPA Board members), presented the opening plenary session by describing a Neonatal Intensive Parenting Unit (NIPU), which was based on a concept they published in the Journal of Perinatology in 2017. Developing ways to transform NICUs into NIPUs is an ongoing project of NPA, which includes a focus (in theory and practice) on the parent as the primary caregiver in the NICU and on the role of NICU staff in supporting parents in parenting their NICU baby. The presentation concluded with audience participation of John Lennon’s song “Imagine” with words paraphrased to describe NPA’s vision for NIPUs around the world. The NIPU, as a model of care, was very well received by the participants and collaboration with many professionals, parents and health care institutions are emerging as a result of the presentation.

On Friday, March 2nd, Sage Saxton, PsyD presented an abstract on the work of the Training and Competencies subgroup of the NPA NICU Psychologists group. Her presentation highlighted the need for unique training and competency by those providing psychological services in the NICU. Sue Hall, MD also presented an abstract about her work in collaboration with graduate NICU parents to develop an online NICU staff education course that teaches NICU staff how to provide psychosocial care to NICU parents. The distinctiveness of this program is that parents’ stories and perspectives are embedded in each module supporting the focus of the lesson.

NPA contributed to the list of workshops on Friday, March 2nd. As a follow-up to Thursday’s plenary session about NIPUs, Mike Hynan, PhD, Sue Hall, MD and Raylene Philips, MD lead a workshop on “How to Turn Your NICU Into a NIPU.” Members of the NPA team joined Drs. Hynan, Hall and Phillips to facilitate workshop participants in using a NIPU check list to evaluate current practices in six areas of focus: family-centered developmental care, peer-to-peer support, mental health professionals, palliative care, discharge planning and staff education and support. The participants in each group assessed their own NICU on the specific areas and developed ideas to support integration of the NIPU concepts and practices into their institution. After group discussions, a spokesperson from each group presented the
“...Mike Hynan, PhD, Sue Hall, MD and Raylene Phillips, MD, presented the opening plenary session by describing a Neonatal Intensive Parenting Unit (NIPU), which was based on a concept they published in the Journal of Perinatology in 2017. Developing ways to transform NICUs into NIPUs is an ongoing project of NPA, which includes a focus (in theory and practice) on the parent as the primary caregiver in the NICU and on the role of NICU staff in supporting parents in parenting their NICU baby.”

Also on Friday, a workshop on advocating and securing mental health providers in the NICU and related settings was presented by the NPA NICU Psychologists group led by Stephen Lassen, PhD, Chavis Patterson, PhD, Pamela Geller, PhD and Amy Baughcum, PhD. An overview of the emergence of mental health services in NICUs during the last 20 years was presented. Successful approaches to educating leaders in healthcare systems about the need for such services and how to obtain them were offered, with practical suggestions for job descriptions and billing codes for services. The participants offered their experiences and had numerous questions for the presenters. Many participants indicated that they were taking the information back to their institutions with the goal of obtaining a dedicated psychologist for their NICU.

On the last day of the conference, Saturday, March 3rd, NPA Board member, Vincent Smith, MD, MPH and Jonathan Litt, MD, MPH, ScD presented a plenary session on deciphering non-traditional family structure in the NICU. They presented the results of nine hours of recorded interviews with LGBT parents about their expectations entering the NICU and their positive and negative experiences. In video clips, parents shared what they would like to tell staff and other parents about making the NICU a more accepting and comforting setting. The presenters gave recommendations for how to provide psychosocial support to parents who become parents in non-traditional ways. The results of these interviews provided participants with a new lens in which to view their interaction with all parents, but specifically non-traditional families.

The mission and vision of the National Perinatal Association is in complete alignment with the focus of the 31st Annual Gravens Conference. A great deal of work has been done in the past is currently being done by NPA members to create positive change in perinatal care in ways that will support the emotional and mental health and well-being of babies, parents and families.

We invite you to view the many opportunities available to join your efforts with those of NPA by going to www.nationalperinatal.org. You can become as actively engaged as you choose by becoming a member, joining a workgroup, or making a donation.

References

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It is hard to be a Neonatologist who took the path through Pediatrics first, and not use a Dr. Seuss quote from time-to-time.

If your unit is anything like ours where you work, I imagine you feel as if you are bursting at the seams.

As the population grows, so do our patient volumes. I often quote the number 10% as being the number of patients we see out of all deliveries each year in our units. When I am asked why our numbers are so high, I counter that the answer is simple. For every extra 100 births, we get 10 admissions. It is easy though, to get lost in the chaos of managing a unit in such busy times, and not take a moment to look back and see how far we have come. What did life look like 30 years ago or 25 years ago? In Winnipeg, we are preparing to make a big move into a beautiful new facility in 2018. This will see us unify three units into one, which is no easy task but will mean a capacity of 60 beds compared to the 55 operational beds we have at the moment.

“What did life look like 30 years ago or 25 years ago?”

In 2017, were routinely resuscitating infants as young as 23 weeks, and now with weights under 500g at times. Whereas in the past, anyone under 1000g was considered quite high risk, now the anticipated survival for a...
28 week infant at 1000g is at or above 95%. Even in my short career, which began in 1998 in terms of Pediatrics, and then 2001 in Neonatology, our approach in terms of comfort with the smallest infants, has eased greatly. What inspired this post, though, was a series of newspaper clippings from 1986 and 1991 that made me take a moment to look up at the sky and mutter “huh.” When you take a trip down memory lane and read these posts, I think you will agree we have come a LONG way, and (in truth), in a very short period of time.

This unit was built with 3.5 million dollars. Imagine how far that would go now. The unit had a capacity of 18 beds, but opened with only 12 and a nursing staff of 60 (compare that to 150 now!). They couldn’t open more beds due to the lack of available nurses with sufficient skills.

My favorite comment to provide some perspective was that 5 to 10 years before this time, the estimated survival for infants under 1000g was 15%!

Have we ever come a long way in family-centred care. Can you imagine having a baby born now at 695g whose family wouldn’t get to hold them till almost 3.5 months of age?! That is what happened in the case described in this article.

Did you know the old unit had 19 beds (was originally 9 babies), and expanded to 27 at this time?

It cost 3.1 million to build this unit.

The long and the short of it is that, yes, things are busy, and in fact, busier than they have ever been. Do not lose sight, however, wherever your practice is that you are part of a story for the ages. Things that were once

*“My favorite comment to provide some perspective was that 5 to 10 years before this time, the estimated survival for infants under 1000g was 15%!"*

The National Perinatal Association (NPA) is an interdisciplinary organization that gives voice to the needs of parents, babies and families and all those interested in their health and wellbeing. Within NPA, parents and professionals work together to create positive change in perinatal care through education, parent programs, professional guidelines and events.

www.nationalperinatal.org
thought impossible or miracles, are now everyday events, and you have been part of it. For those of you who read this post, this will likely bring about a lot of nostalgia for you. Thirty years in medicine is not a long time, and we have accomplished so much along the way. For those of you who are just starting out, imagine where we will be in 30 years from now. I, for one, can’t wait to read about it and wonder where we will have gone by then.

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KEEP IT CONFIDENTIAL

by Kafrn Fedun

When it comes to important items for staff in the Medical Information Department to observe, confidentiality of patient information heads the list.

Maintaining patient confidentiality is, however, not limited to Medical Information personnel alone. All of us who work at HSC should be conscious of the importance of confidentiality at all times.

How often have you overhead these or similar comments being made to staff?

“I hear the patient in room 259 has complications from the bypass he had last week.”

“Your uncle’s x-ray report was sitting right there so I had a quick look.”

“Glad to see you made it to the cafeteria. Mrs. Smith. How are the cancer treatments going?”

Are these innocent remarks or irresponsible breaches of confidentiality? During Health Information Awareness Week held November 18 to 22, there and other instances were answered by staff from Medical Information.

According to Orihanie Lambe, Supervisor of Medical Information, the week was part of a national event to create awareness of the Medical Information profession and the services it provides. The week is also served to promote the need to maintain confidentiality of patient information.

“Health Information Awareness Week 1991 received around the idea that this information is the core of health care, and confidentiality is a key part of that care,” says Lambert. Along with posters and leaflets promoting the week, we featured displays in the Thrusho concourse, with daily quizzes on the services provided by the Medical Information Department.

The principle of confidentiality is an important concern for everyone associated with the hospital says Evelyn Fonde, Director of Medical Information at HSC.

“You don’t have to be a creator or keeper of a medical record to be aware of the principles of confidentiality,” she explains. “It applies to anybody who has knowledge of a patient’s social history, health history, financial picture, or any multitude of things. Patients should expect a certain amount of privacy in their situation like this.”

Confidentiality encompasses not only what is said, but where and when personal information is discussed. This is especially crucial to remember in an environment where there is a high

mater need to share information vital to patient care.

“Having it easy to-vor in the fact that while you’re talking to a colleague about a case, there may be other people around who have no business hearing the information,” Fonde cautions. “Such conversations should not take place in situations, cafeterias or other public areas where they may be overhead by anyone.”

To help ensure patient privacy HSC has taken a number of measures. These include screening procedures for access to medical records, proper disposal techniques for confidential material and policies that prohibit records from being removed from HSC premises.

New staff are made aware of the importance of confidentiality during the orientation sessions conducted by the Human Resources Department. During the general introduction in the orientation, we talk about confidentiality and show videos entitled “Well

Nursery design reflects expertise in planning

The participation of user staff in the planning of the Intermediate Care Nursery was integral to the development of a facility that would meet all the various needs.

Utilizing the expertise of members of the Intermediate Care Nursery User Group, a functional program was prepared, reflecting the objectives and views of medical, nursing and support staff.

The physical renovation of the nursery was carried out in a five-phase operation. The first four phases, which began in September 1990, dealt with relocation of the original occupants of the space annexed for the expansion. Actual work on the nursery began in March of this year.

During the nursery construction phase, patients and staff faced the major challenge of temporary housing in two locations. Their patience and co-operation were rewarded when the move into the new nursery finally took place October 24.

The Intermediate Care Nursery project was managed by Planning Department Project Officer, Laura Snow, who co-ordinated input from users, architects and engineers through the various stages of the project.

During construction, site activities were co-ordinated by George MacDonald. Conclusion of the planning and decision-making process, new electrical and mechanical systems were completed in co-operation with the Property Services and Maintenance Departments.

The User group included Dr. Molly Seshia, Head of Neonatology; Myrna Rouke, Director of Nursing, Women’s Hospital; Barbara Overly, Head Nurse, Intermediate Care Nursery; Evelyn Garbard, Superintendent, Children’s Hospital Respiratory Therapy and Lorraine Kendall, staff nurse, Neonatal Intensive Care Unit and Max Herin of GHM Architects.

The group worked with Manitoba Health Services Commission staff to establish the annual budget. Engineers for the project were Sturgeon Mitchell Construction Associates Ltd. and the general contractor was Prestwick Construction Co. Ltd.

The skill, dedication and hard work of the User Group and others who were involved at various stages of the project, has provided Manitobans with a neonatal care facility that is a leader in the country.

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Nursery expansion enhances care

The official opening of the Intermediate Care Nursery was a happy occasion for everyone involved. Above, Ray McCord, HSC Board Chairman (R) and Health Minister Donald Oranch, cut the ribbon at the formal ceremony (continued from p. 1).

When you walk into the new nursery, you are greeted by cradled infants and white storks leaning to work without bumping into each other. Instead the soft peach colored walls and baby bear borders provide a warm welcome to a spacious, efficient unit.

Perhaps the Honorable Donald Oranch summed it up best when describing the nursery: “When you get the feeling of being born in an institutional facility, as you do here, everyone wins: parents, patients and staff.”

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Health Sciences Centre, Winnipeg, October/November 1991

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CALL FOR EDITORIAL

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CHECK AMMONIA

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Clinical Trials (ClinicalTrials.gov)

Glove-Based Care in the NICU to Prevent Late Onset Sepsis (GloveCare)

This study is recruiting participants.

Sponsor: Hamilton Health Sciences Corporation
ClinicalTrials.gov Identifier: NCT03078335
First posted: March 13, 2017; Last Update: June 22, 2018
Actual Study Start Date: June 5, 2017
Estimated Study Completion Date: March 22, 2018
www.clinicaltrials.gov/ct2/show/NCT03078335?recrs=ab&cond=NICU&rank=2

Brief Summary: Babies that get an infection after 3 days of age while in the Neonatal Intensive Care Unit (NICU) is not related to their delivery, but to the hospital environment. Preventing these infections results in shorter hospital stays for babies, less risk of long-term health problems and less health care resources required to care for them. Handwashing alone doesn't remove all bacteria from the hands of healthcare workers, and studies have shown that infections in adults and children admitted to hospital decrease if health care providers use clean, non-sterile gloves when treating patients. The main focus of this study will be to find out if using gloves when caring for newborns in the NICU is better than washing hands alone. McMaster Children’s Hospital and The Hospital for Sick Children will be the pilot sites to participate in a future larger study where some infants will be cared for using non-sterile gloves, and others will be cared for using the standard hand washing method.

Condition: Sepsis Newborn Infection

Detailed Description: Late Onset Sepsis (LOS) is defined as infection occurring after 72 hours of life in neonates admitted to the Neonatal Intensive Care Unit (NICU). LOS can lead to severe complications, including death and major neurologic sequelae, and contribute to increased length of stay and costs of care. These hospital-acquired infections are largely preventable. Handwashing prior to any patient care is considered the cornerstone of prevention and is the standard of care in the NICU. Adherence to hand washing however, is difficult to achieve, with estimates of compliance among healthcare workers ranging from 30% to 60%. Observational studies in at-risk critically ill children suggest a reduction in hospital-acquired infections and central line associated bloodstream infections with glove-based care in addition to hand hygiene. One small single-centre randomized trial of glove based care versus hand hygiene alone to assess LOS rates in extremely premature infants in the NICU showed a reduction in gram positive infections and central line infections with glove-based care. We propose to test the effect of glove-based care in an adequately powered, rigorously designed and conducted, cluster randomized controlled trial (RCT) after completing a feasibility pilot study.

This pilot study will include all babies in the NICU being randomized to six months of glove-based care or standard of care, and then the following six months will be the opposite arm. All health care provider contact with the infant will require gloves in the intervention arm, but families of infants admitted to the NICU will not be required to wear gloves. The main outcome measured will be the number of episodes of infections in the blood, urinary tract, and cerebrospinal fluid comparing the glove intervention arm with the control arm. Invasive infections are an important challenge for infants admitted to the NICU and reducing this risk can improve the quality and quantity of neonatal survivors from the NICU.

Study Type: Interventional; Interventional Model: Crossover Assignment

Estimated Enrollment: 900

Intervention Model Description: This pilot study is a single centre NICU based cluster-randomized crossover trial, with two crossover periods each lasting six months, and a 2-week washout period in between.

Masking: Single (Outcomes Assessor)

Masking Description: The final adjudication of events will be completed by two of the investigators blinded to study arm, based on a summary report of each event after completion of the pilot.

Primary Purpose: Prevention

Arms:
- **Experimental**: Glove-based care - The intervention is the use of non-sterile gloves, after standard hand hygiene for all routine patient care needs.
- **Active Comparator**: Standard care - The control group will provide standard care, that is, hand hygiene before all patient, bed, and intravenous catheter contact.

Intervention/Treatment:
- **Other**: Glove-Based Care - Described in Experimental Arm: Glove based care
- **Other**: Standard of Care - Hand Hygiene - Hand hygiene washing with soap and water, or alcohol based hand rub

Primary Outcome Measures:
1. Late onset sepsis events [Time Frame: Weeks of admission to the NICU. Infection must occur at >72 hours of age, throughout neonatal admissions for the six month duration of each study arm]
The anticipated incidence of LOS is 10% of patients based on Canadian Neonatal Network retrospective data. Infection is defined as blood stream, urinary tract, or cerebrospinal fluid infection based on one or more positive cultures with a bacterial or fungal pathogen (two cultures required for Coagulase negative staphylococcus), at least two compatible signs and symptoms (including temperature instability, hemodynamic changes, respiratory distress and increased inflammatory markers), and the need for antimicrobial treatment.

Secondary Outcome Measures:
1. Time to first infection [Time Frame: Time from admission to NICU to discharge (days to months) throughout neonatal admissions for the 6-month duration of each study arm] Time from admission to NICU to first infection in days
2. Length of Stay [Time Frame: Time from admission to discharge (days to months) throughout neonatal admissions for the 6 month duration of each study arm] Time from admission to discharge (days)
3. All-cause mortality [Time Frame: Duration of study (1 year)] Number of deaths (number of patients who die during study)
4. Proportion colonized by antibiotic resistant organisms at any point during their NICU stay [ Time Frame: Weeks of admission to NICU, for the duration of study (1 year) ] Proportion of infants who become colonized with antibiotic resistant organisms during surveillance screening as part of routine care (number of patients)

Ages Eligible: Child; Sexes Eligible: All
Accepts Healthy Volunteers: Yes

Inclusion Criteria: Infants admitted to the NICU at participating sites for >2 days until discharge.

Exclusion Criteria: Babies requiring contact precautions due to other reasons (as glove based care would be occurring).

Location: McMaster Children’s Hospital, Hamilton, Ontario, Canada

Contacts:
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- Dominik Mertz, MD, MSc, FRCPC 905-527-4322 ext 43952; mertzd@mcmaster.ca
Medical News, Products & Information

Early Diagnosis Can Save Babies' Lives: A Guide to Severe Combined Immunodeficiency Disease (SCID)

A review provides guidance on a deadly, but rare, disease that is potentially curable if identified early. Severe Combined Immunodeficiency Disease (SCID), known as the "Bubble Boy Disease" in the 1970s, is treatable with stem cell transplant, gene therapy and other treatments if identified at birth or soon after.

The review, published in CMAJ (Canadian Medical Association Journal), is aimed at pediatricians, family physicians and other doctors who may treat newborns, including those who appear healthy at birth but begin to get severe, repeated infections requiring emergency department visits.

The death rate for Severe Combined Immunodeficiency Disease is at least 30%, with infection causing 60% of deaths in infants.

Ontario was the first jurisdiction in Canada to offer screening for severe combined immunodeficiency disease in 2013 as part of the heel prick test performed soon after birth. Screening has been expanded to the Maritime provinces and will be implemented in several other provinces.

"This review informs physicians who may treat newborns in their practice (e.g., family physicians, obstetricians, pediatricians) on how to approach patients and counsel families who are faced with an abnormal screen," writes Dr. Stuart Turvey, a Professor with the UBC Department of Pediatrics and an investigator, BC Children's Hospital, Vancouver, BC, with coauthors.

The review includes features to watch for in newborns with repeated illnesses, information on screening and diagnosis, and treatments for the disease, as well as the approach and support for parents of babies who may receive a positive screen, including false positives.

"The opportunity to identify severe combined immunodeficiency early in life has transformed outcomes for this otherwise fatal condition. Introducing this assay into newborn screening programs throughout Canada has the potential to save lives and prevent suffering of patients and families affected by this condition," the authors conclude.

The review was created by a pan-Canadian group of physicians from BC Children's Hospital, University of British Columbia, Vancouver, BC; University of Montreal and CHU Sainte-Justine, Montréal, Quebec; IWK Health Centre and Dalhousie University, Halifax, Nova Scotia; and The Hospital for Sick Children and the University of Toronto, Toronto, Ontario.

Rhinovirus and Risk for Bacterial Infection in Infants

There are ~ 400,000 febrile infants 1-90 days of age evaluated in the US every year. The investigators of this study combined their expertise in febrile infants and diagnostic technology to undertake the study which addresses one of the most common clinical questions they encounter, What does it mean when feverish infants are infected with rhinovirus?

They found that rhinovirus detection was common among well-appearing infants undergoing evaluation for fever. Detection of rhinovirus did not impact the risk of concurrent urinary tract infection at any age or invasive infection in infants 1-28 days. These data have implications for febrile infant management.

The research was published online in Pediatrics on January 18, 2018 as "Rhinovirus in Febrile Infants and Risk of Bacterial Infection."

Cervical Device Reduces Rate of Preterm Birth

"Effect of Cervical Pessary on Spontaneous Preterm Birth in Women With Singleton Preganancies and Short Cervical Length - A Randomized Clinical Trial" by Gabriele Saccone, MD; Giuseppe Maria Maruotti, MD; Antonia Giudicepietro, MD; et al Pasquale Martinelli, MD; for the Italian Preterm Birth Prevention (IPP) Working Group - December 19, 2017


Bottom Line: Pregnant women with a short cervix who used a small silicone ring called a cervical pessary to keep their cervix closed had a lower rate of preterm birth at less than 34 weeks.

Why The Research Is Interesting: Preterm birth is a major cause of illness, disability and death for infants. A cervical pessary is intended to keep the cervix closed and to change the inclination of the cervical canal, but the results of randomized clinical trials have been contradictory.

Who and When: Three hundred women with a short cervix and without a history of sudden preterm births; the clinical trial was conducted from 2016-2017.

What: Half of the woman had a cervical pessary inserted and half did not (intervention); spontaneous preterm birth at less than 34 weeks of gestation (outcome)

How (Study Design): This was a randomized clinical trial. Randomized clinical trials (RCTs) allow for the strongest inferences to be made about the true effect of an intervention. However, not all RCT results can be replicated in real-world settings because patient characteristics or other variables may differ from those that were studied in the RCT.

Authors: Gabriele Saccone, MD, University of Naples Federico II, Naples, Italy and coauthors.

Results: Women who used a cervical pessary had a lower rate of spontaneous preterm birth.

Study Limitations: The trial was conducted at one facility and that raises questions about the generalizability of its findings.

Study Conclusions: Women with a short cervix and without a history of spontaneous preterm birth who used a cervical pessary had a lower rate of spontaneous preterm birth compared with women who did not use the device. The results must be confirmed in multicenter clinical trials.

Reduced Exposure to Bullying Could Reduce Mental Illness in Extreme Preemies - Early Mental Health Support Could Also Prove Beneficial

Decreased exposure to bullying and family problems during childhood and adolescence could help reduce adult mental illness in Extremely Low Birth Weight (ELBW) preemies, according to a new study from McMaster University.
Furthermore, early mental health support for extremely low birth weight survivors who are born at 2.2 pounds or less, and their parents could also prove beneficial.


"In terms of major stresses in childhood and adolescence, preterm survivors appear to be impacted more than those born at normal birth weight," said Ryan J. Van Lieshout, Assistant Professor of Psychiatry and Behavioral neurosciences at McMaster University and the Albert Einstein/Irving Zucker Chair in Neuroscience.

"If we can find meaningful interventions for Extremely Low Birth Weight survivors and their parents, we can improve the lives of preterm survivors and potentially prevent the development of depression and anxiety in adulthood."

The study utilized the McMaster Extremely Low Birth Weight Cohort, which includes a group of 179 ELBW survivors and 145 normal birth weight controls born between 1977 and 1982, which has 40 years' worth of data.

The study showed that although these preemies were not necessarily exposed to a larger number of risk factors compared to their normal birth weight counterparts, these stresses appeared to have a greater impact on their mental health as adults.

Besides bullying by peers and a small circle of friends, researchers looked at a number of other risk factors, like maternal anxiety or depression and family dysfunction.

"We believe it may be helpful to monitor and provide support for the mental health of mothers of preemies, in particular, as for the purposes of this study, they were the primary caregiver," said Van Lieshout.

"There can also be family strain associated with raising a preemie and all the related medical care, which can lead to difficulties. Support for the family in a variety of forms might also be beneficial."

The paper builds on previous research that identified that ELBW survivors have an increased risk of mental illness in adulthood.

"We are concerned that being born really small and being exposed to all the stresses associated with preterm birth can lead to an amplification of normal stresses that predispose people to develop depression and anxiety later in life," said Van Lieshout.

He recommended future research focus on the timing and type of supports for risk factors that would create better mental health outcomes in preemies.

The study was supported by grants from the Canadian Institutes of Health Research and the U.S. National Institute of Child Health and Human Development.

Additional authors on the study came from the departments of psychiatry and behavioral neurosciences; pediatrics, and psychology, neuroscience and behavior at McMaster.

Rapid Whole-Genome Sequencing of NICU Patients Is Useful and Cost-Effective - Findings Reported at ASHG 2017 Annual Meeting

Rapid whole-genome sequencing (WGS) of acutely ill Neonatal Intensive Care Unit (NICU) patients in the first few days of life yields clinically useful diagnoses in many cases, and results in lower aggregate costs than the current standard of care, according to findings presented at the American Society of Human Genetics (ASHG) 2017 Annual Meeting in Orlando, FL.

Shimul Chowdhury, PhD, FACMG, Clinical Laboratory Director at the Rady Children's Institute for Genomic Medicine, and his colleagues focused their analysis on a broad swath of NICU patients for whom a genetic diagnosis might help inform treatment decisions and disease management. They studied the clinical utility and cost-effectiveness of sequencing infants and their parents.

"Newborns often don't fit traditional methods of diagnosis, as they may present with non-specific symptoms or display different signs from older children," said Dr. Chowdhury. In many such cases, he explained, sequencing can pinpoint the cause of illness, yielding a diagnosis that allows doctors to modify inpatient treatment and resulting in dramatically improved medical outcomes in both the short- and long-term.

NEONATAL NURSE PRACTITIONER

St. Agnes Hospital, a large, community teaching hospital in Baltimore, Maryland is recruiting for a full-time neonatal nurse practitioner to work rotating days and nights in the NICU, well baby nursery and attending deliveries. St. Agnes has a level 3A NICU staffed by a group of four neonatologists and an experienced group of NNPs.

Please send CVs to: Karen Broderick, MD kbroderi@ascension.org
Because of the potential for early intervention and immediate adjustment in care, the researchers used a rapid WGS procedure that took three to seven days from sample collection to delivering results to patients’ families. The process can be further accelerated if medically necessary. In contrast, most clinical diagnostic tests take four to six weeks.

In 34 (35%) of the 98 patients enrolled in the study, WGS yielded a genetic diagnosis, and in 28 (80%) of those patients, that diagnosis led to changes in medical management, such as the use of medications targeted to the underlying disease, avoidance of unnecessary surgery, and guidance about palliative care. Cost-effectiveness analyses are ongoing, but among the first 42 infants sequenced, the researchers calculated a $1.3 million net cost savings for that hospitalization versus the current standard of care.

"The cost savings were especially striking, given that sequencing costs are still high - even with those costs, we found that rapid WGS was not just clinically useful but economically prudent," Dr. Chowdhury said. "Given these benefits, we’d eventually like to see rapid WGS as a reimbursable first-tier test for a proportion of infants in the NICU."

Currently, the researchers are looking to expand their study and assess the effectiveness of their approach across health systems and populations. This summer they launched partnerships with children’s hospitals in California and Minnesota, an effort that will involve scaling up the rapid WGS process to meet demand and yield new insights about its clinical utility, cost-effectiveness, and ease of implementation in different environments.

Dr. Chowdhury noted the important contribution of genetics research to their progress so far. "Translational research leading to improvements in the speed and accuracy of sequencing tests is so important to our work, and has a real impact on patients and their families," he said.

Dr. Chowdhury presented this research in October at the American Society of Human Genetics 2017 Annual Meeting, Orlando, Florida.

Preterm Babies May Suffer Setbacks in Auditory Brain Development, Speech

Preterm babies born early in the third trimester of pregnancy are likely to experience delays in the development of the auditory cortex, a brain region essential to hearing and understanding sound, a new study reveals. Such delays are associated with speech and language impairments at age two, the researchers found.

The findings are reported in eNeuro, a journal of the Society for Neuroscience.

"We have a pretty limited understanding of how the auditory brain develops in preterm infants," said University of Illinois speech and Hearing Science Professor Brian Monson, who led the study. "We know from previous research on full-term newborns that not only are fetuses hearing, but they’re also listening and learning."

Ultrasound studies reveal, for example, that, beginning at least as early as 25 weeks into gestation, fetuses will blink or move in response to externally produced sounds, he said. Other research shows that newborns prefer to listen to sounds - such as music or speech - that they were exposed to in the womb over unfamiliar sounds. And electroencephalogram studies of the brains of preterm infants show electrical activity in the auditory cortex in response to sound.

"From these types of studies, we know that fetuses in the third trimester of gestation are hearing, learning and creating memories," Monson said. "It's pretty remarkable that such an immature system already has the ability to start distinguishing and learning."
To better understand how the auditory cortex matures in the last trimester of gestation, Monson and his colleagues turned to a large dataset collected at the St. Louis Children’s Hospital Neonatal Intensive Care Unit between 2007 and 2010. The 90 premature infants in the study had undergone magnetic resonance imaging one to four times in the course of their stay in the NICU. Another 15 full-term babies were recruited from the Barnes-Jewish Hospital in St. Louis and scanned within the first four days of life. These scans were used as examples of uninterrupted fetal brain development, for comparison with the preterm babies.

The team used diffusion neuroimaging to study development of the auditory cortex in the infants’ brains.

"This technique measures the diffusion of water in the brain tissues, which can tell you a lot about the development of neurons and axons," Monson said. As brain structures grow and mature, water diffusion in the gray matter and white matter also changes in recognizable patterns, allowing researchers to track how the tissue is developing, and at what rate, he said.

The team focused on the primary auditory cortex, which is the first cortical region to receive auditory signals from the ears via other parts of the brain, and the non-primary auditory cortex, which plays a more sophisticated role in processing those stimuli.

"We wanted to know: What is the relationship between these two regions? Do they mature at the same time, but at different rates? Do they mature at different times, but similar rates?" Monson said. "A different rate of maturation may render one tissue more vulnerable to injury or disruption associated with preterm birth."

The analysis revealed that by 26 weeks of gestation, the primary auditory cortex was in a much more advanced stage of development than the non-primary auditory cortex. Between 26 weeks and about 40 weeks - the latter the equivalent of full-term birth - the non-primary auditory cortex in the preterm infants matured quickly, partially catching up to the primary auditory cortex. Both regions appeared less developed at 40 weeks in the preterm infants than in the full-term babies.

The team also found an association between the delayed development of the non-primary auditory cortex in infancy and language delays in the children at age two, suggesting that disruptions to this part of the brain as a result of premature birth may contribute to the speech and language problems often seen later in life in preemies, Monson said.

"It's exciting to me that we may be able to use this technique to help predict later language ability in infants who are born preterm," he said. "I hope one day we also will be able to intervene for those infants who may be at greatest risk of language deficits, perhaps even before they begin to use words."

The research team also included scientists and physicians from Harvard Medical School, University College London and Washington University School of Medicine in St. Louis.

The National Institute of Child Health and Development, the National Institute of Neurological Disorders and Stroke and the National Institute of Mental Health supported this research.

UIC Researcher Using Imaging to Identify Women at Risk of Giving Birth Prematurely

Newswise — Ultrasound is traditionally used on pregnant women to study the anatomy, movement and blood flow of the developing fetus, but
physical developments such as pneumonia and meningitis. They can also lead to longer hospital stays and account for nearly a $30 billion cost to society.

UIC researchers, led by Barbara McFarlin, Professor of Nursing, have received a five-year $2.84 million grant from the National Institute of Child Health and Human Development to develop techniques to accurately predict preterm birth.

"By recognizing which women are at risk, health care professionals could provide early interventions, treatments and closely monitor these treatments to prevent preterm birth or to improve health outcomes," McFarlin said.

Eight hundred women will be divided into three groups in McFarlin’s latest study: women who have previously had a baby prematurely; women who at 20 weeks have a shortened cervix; and a low-risk control group. The women will undergo an ultrasound examination of the cervix twice during the study: once at 20 weeks of pregnancy, and then, four weeks later.

There currently is no way to predict premature birth, McFarlin said. However, in some cases, health care professionals know that a preterm birth is likely because of a shortened cervix (the lower part of the uterus). McFarlin and her engineering colleague, William O’Brien Jr., a research professor at the Urbana-Champaign campus, are taking ultrasonic detection of cervical changes to a microscopic level.

In previous studies conducted in pregnant rats, McFarlin used ultrasound to detect collagen tissue changes in the animals’ cervix. She then took those findings and expanded the study to include pregnant women. Using the same noninvasive procedure she used in the animal model, McFarlin detected collagen changes in the cervix before the cervix shortened in women destined to give birth prematurely.

"At 17 to 20 weeks of pregnancy, we were able to predict who was going to deliver preterm," McFarlin said. "We found that before the length of the cervix shortens, the microscopic tissue structure has to change and the collagen remodels."

In addition to conducting research using ultrasound, McFarlin will learn how the pregnant women respond to progesterone to prevent premature labor. Progesterone is the current standard of care for women who have previously delivered a baby preterm or who have a short cervix. Progesterone, a natural hormone, only reduces the incidences of prematurity by 40%, McFarlin said. “We want to find out what occurs with the other women and why it does not work,” she said.

McFarlin will also be assisted by Mulubrhan Mogos at the UIC College of Nursing.

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# How does Medolac compare to other milk banks?

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