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HIGHLIGHTS OF THE ISSUE

Review Article :
Delayed Umbilical Cord Clamping:
and Improved Neonatal Outcomes



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23rd Annual Scientific Congress of the Perinatal Society of Sri Lanka,
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Published Abstracts

Supporting exclusive breast feeding: The Mother- Baby Friendly Initiative

Breastfeeding is unequivocally accepted as the best way of providing the ideal food for the healthy growth and development of infants, and protecting them from morbidity and mortality due to infections and chronic diseases later in life. Exclusive breastfeeding(XBF) is recommended, starting within one hour of birth and for the first 6 months of life, with continued breastfeeding up to 2 years of age and even beyond. Sri Lanka is in the forefront of exclusive breast feeding nations in the world; According to the Sri Lanka Demographic Health Survey(DHS) - 2016 almost all mothers(99%) have breast fed their infants at some point, 90% have initiated exclusive breast feeding(XBF) within one hour of birth and the majority(64%) continued XBF till their baby completed five months of age.

In 1991, the Baby-friendly Hospital Initiative (BFHI) was launched jointly by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), to promote and protect exclusive breast feeding in mothers. This was later expanded as the Mother-Baby Friendly Hospital Initiative(MBFHI) to include 'mother friendly' practices as well. The MBFHI formulated a list of recommendations and interventions termed '**Ten steps to Promote Exclusive Breast Feeding**', compiled by a global expert group of the two health organizations. This 'Ten Step approach' included ten steps to be followed by health care institutions which would help promote and support mothers to establish and continue exclusive breast feeding from birth. This was a multipronged approach: ranging from formulating a policy framework to ensure and protect mothers' rights to continue XBF for six months(eg.

right to maternity leave), empowering health facilities with the necessary framework to follow the 'Ten Steps', improving awareness of XBF and its benefits in pregnant and lactating mothers and health care staff and training relevant health care staff in the support and counselling of breast feeding mothers. It also recommended creating a supportive environment(such as Lactation Management Centres and Mother-Baby-Centres) in these hospitals to support XBF. The recommendations on policy were backed up by a legal framework- the Breast Milk Substitute Marketing Code - to protect breast feeding mothers from undue influence from the milk food industry.

Briefly, the Ten Steps are as follows:

- Have a written breastfeeding policy that is routinely communicated to all health care staff.
- Train all relevant health care staff in skills necessary to implement this policy.
- Inform all pregnant women about the benefits and management of exclusive breastfeeding.
- Help mothers initiate breastfeeding within one hour of birth. (i.e place babies in skin-to-skin contact with their mothers immediately following birth for at least an hour and encourage mothers to recognize when their babies are ready to breastfeed and offer help if needed).
- Show mothers how to breastfeed, and how to maintain lactation even when separated from their infants.
- Give newborn infants no food or drink other than breast milk unless medically indicated.
- Practise rooming in 24 hours a day.
- Encourage breastfeeding on demand.

- Give no artificial teats or pacifiers to breastfeeding infants.
- Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

Hospitals abiding by these ‘Ten Steps’ were designated as ‘Baby Friendly’ Hospitals.

In Sri Lanka, the BFHI was launched in 1992, soon after commencement of the global initiative and most hospitals offering maternity and newborn services in the country were designated as BFHI hospitals. However, no formal or other evaluation of MBFHI has taken place since its initiation. A recent countrywide survey done showed that over the past 2 decades, some aspects of the MBFHI ‘Ten Steps’ were not being implemented in its true form and the concept of MBFHI itself had taken a back seat in some institutions,

This is an alarming factor, given the importance of exclusive breast feeding during early infancy and its continuance in the early years of childhood.

In Sri Lanka, during these times of hardship with undernutrition rising to alarming rates in vulnerable sectors, it is vital to promote and sustain exclusive breast feeding in early infancy. Towards this aspect, a regular programme of monitoring, evaluation and continuous in-service training of staff, on the implementation of the MBFHI will be a key factor. This is also vital in order to continue maintaining the excellent XBF record of our mothers. To this effect, recommendations only should not suffice; policy makers should bring in legislature to support, promote and protect exclusive breast feeding in Sri Lankan mothers.

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References

1. <https://www.who.int/tools/elena/bbc/implementation-bfhi> -Implementation of the Baby friendly Hospital Initiative - WHO/ 2014

Holistic Intervention Strategies to Mitigate Premature Deliveries: Evidence-Based Community and Clinical Approaches

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Introduction

Premature delivery, defined as childbirth occurring before 37 weeks of gestation, poses significant risks to both maternal and neonatal health. This global problem, which has been described as a silent epidemic, affects millions of families worldwide and represents a major public health challenge. The consequences of premature deliveries are profound, including increased rates of neonatal morbidity and mortality, long-term developmental issues, and significant economic burdens on healthcare systems. To effectively address this issue, a comprehensive approach that integrates both community and clinical strategies is essential. This essay explores holistic intervention strategies to mitigate premature deliveries, emphasizing evidence-based community and clinical approaches while highlighting the global nature of this epidemic.

Understanding Premature Delivery

Premature delivery is a complex phenomenon influenced by a myriad of factors. It can be classified into different categories based on the timing of delivery: extremely preterm (before 28 weeks), very preterm (28-32 weeks), and moderate to late preterm (32-37 weeks). The causes of premature delivery are multifactorial, including maternal health conditions (e.g., preeclampsia, diabetes), infections, multiple pregnancies, and socioeconomic factors. Understanding these causes is critical for developing targeted interventions.

Global Prevalence and Impact

The prevalence of premature deliveries varies globally, with significant disparities between high-income and low-income countries. According to the World Health Organization (WHO), an estimated 15 million babies are born preterm each year, accounting for about 10% of all births. The highest rates are observed in sub-Saharan Africa and South Asia, while lower rates are seen in high-income countries. Despite this variability, premature delivery remains a silent epidemic due to its widespread impact and the often underreported nature of its consequences.

In low-income settings, the lack of access to quality prenatal care, limited resources, and inadequate health infrastructure exacerbate the problem. In high-income countries, while healthcare systems are generally better equipped, issues such as maternal age, lifestyle factors, and healthcare disparities contribute to the problem. The economic burden of premature deliveries is substantial, encompassing costs related to neonatal intensive care, long-term health complications, and the broader impact on families and societies.

Holistic Intervention Strategies

Addressing the issue of premature delivery requires a multifaceted approach that incorporates both community-based and clinical strategies. Holistic interventions should consider the interplay between individual, familial, and systemic factors.

The following sections outline evidence-based strategies for mitigating premature deliveries, focusing on community and clinical perspectives.

Community-Based Approaches

1. Education and Awareness

Community education plays a vital role in preventing premature deliveries. Awareness campaigns can inform expectant mothers and their families about risk factors, warning signs, and the importance of timely prenatal care. Programs that address specific community needs, such as those focusing on the dangers of smoking and substance abuse during pregnancy, can be particularly effective. Evidence suggests that educational interventions can lead to improved maternal behaviors and outcomes.

2. Access to Prenatal Care

Ensuring access to comprehensive prenatal care is crucial for preventing premature deliveries. Community health initiatives can include mobile clinics, telemedicine services, and partnerships with local healthcare providers to reach underserved populations. Providing prenatal care services that are culturally sensitive and accessible can help identify and manage risk factors early, reducing the incidence of premature births.

3. Nutrition and Lifestyle Support

Community-based nutrition programs can support pregnant women by providing access to healthy foods and nutritional counseling. Proper nutrition is essential for reducing the risk of premature delivery. Programs that address lifestyle factors, such as smoking cessation and alcohol reduction, are also critical. Evidence-based initiatives, such as the Women, Infants, and Children (WIC) program in the United States, have demonstrated positive impacts on maternal and neonatal health.

4. Social Support Networks

Social support is a key determinant of maternal health. Community programs that offer support networks, including counseling services, parenting classes, and peer support groups, can help mitigate stress and address psychosocial factors associated with premature deliveries. Research indicates that strong social support can improve maternal mental health and reduce the risk of preterm birth.

Clinical Approaches

1. Risk Assessment and Management

Clinical approaches to preventing premature deliveries involve early risk assessment and management. Routine prenatal screenings and assessments can identify women at high risk for preterm birth. Evidence-based guidelines recommend the use of tools such as cervical length measurements and biomarkers to assess risk. Targeted interventions, such as progesterone supplementation and cervical cerclage, can be implemented based on risk assessment results.

2. Maternal Health Management

Effective management of maternal health conditions is critical for preventing premature deliveries. Conditions such as hypertension, diabetes, and infections need to be carefully monitored and managed throughout pregnancy. Evidence-based clinical practices, including the use of antihypertensive medications and antibiotics for infections, can help reduce the risk of preterm birth.

3. Innovative Treatments and Technologies

Advancements in medical technology offer new opportunities for preventing and managing premature deliveries. The use of tocolytics to delay labor, corticosteroids to enhance fetal lung maturity, and prenatal care technologies such as electronic fetal

monitoring have all contributed to improved outcomes. Clinical research continues to explore innovative treatments and their effectiveness in reducing premature birth rates.

4. Interdisciplinary Care

An interdisciplinary approach to prenatal care, involving obstetricians, maternal-fetal medicine specialists, nurses, and other healthcare professionals, can enhance the management of complex cases. Collaborative care models that integrate various expertise and services can address the multifaceted needs of pregnant women and improve overall outcomes.

Integrating Community and Clinical Approaches

Effective strategies to mitigate premature deliveries require the integration of community-based and clinical approaches. Collaborative efforts between healthcare providers, community organizations, and policymakers can create a cohesive framework for addressing this global issue. Some key strategies for integration include:

1. Coordinated Care Models

Implementing coordinated care models that link community resources with clinical services can enhance the continuity of care for pregnant women. Programs that facilitate communication between prenatal care providers and community support services can ensure that women receive comprehensive care throughout their pregnancy.

2. Policy and Advocacy

Advocacy for policies that support maternal and neonatal health is essential for addressing premature deliveries. Policymakers can play a crucial role in promoting access to prenatal care, funding community health programs, and addressing

social determinants of health. Evidence-based policy initiatives can create a supportive environment for preventing premature births.

3. Research and Evaluation

Ongoing research and evaluation are critical for understanding the effectiveness of intervention strategies and identifying areas for improvement. Research that explores the impact of community and clinical interventions on premature delivery rates can inform future practices and policies. Collaboration between researchers, healthcare providers, and community organizations can facilitate the dissemination of evidence-based practices.

Conclusion

Premature delivery is a global problem with significant implications for maternal and neonatal health. Addressing this silent epidemic requires a holistic approach that integrates both community-based and clinical strategies. By focusing on education, access to care, nutrition, social support, risk assessment, and innovative treatments, we can work towards reducing the incidence of premature deliveries and improving outcomes for families worldwide. The collaborative efforts of healthcare providers, community organizations, and policymakers are essential in creating a comprehensive framework to combat this pressing public health challenge. Through continued research, advocacy, and implementation of evidence-based practices, we can make strides towards mitigating premature deliveries and promoting healthier pregnancies and births on a global scale.

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Delayed Umbilical Cord Clamping: and Improved Neonatal Outcomes

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Abstract

Delayed cord clamping (DCC) has emerged as a critical practice in modern obstetrics, offering significant benefits to both term and preterm infants. Immediate cord clamping was widely practised to facilitate neonatal care and manage maternal health concerns. However, growing evidence underscores the advantages of delaying cord clamping for 1-3 minutes post-birth. This practice enhances neonatal outcomes by increasing blood volume, improving iron stores, and ensuring a smoother transition to independent physiological function. The physiological benefits of DCC, including better oxygenation and higher haemoglobin levels, contribute to a reduced risk of neonatal anaemia and support long-term health. Additionally, DCC has been associated with improved breastfeeding success and is particularly valuable in low-resource settings where access to comprehensive healthcare may be limited. The practice is endorsed by major health organizations such as the World Health Organization and the American College of Obstetricians and Gynaecologists, reflecting its importance in promoting neonatal health.

This article explores the historical context, physiological mechanisms, and global guidelines that inform DCC, highlighting its role as a low-cost, easily implementable intervention with substantial benefits. While

there are instances where immediate clamping may still be necessary, particularly in cases of neonatal distress, DCC is increasingly recognized and accepted globally as the standard of care that optimizes neonatal outcomes.

Introduction

The umbilical cord is a vital link between mother and child throughout pregnancy, providing a conduit for essential nutrients, oxygen, and immune protection. This lifeline plays a pivotal role not only in sustaining fetal life but also in safeguarding the newborn during the early postpartum period. As birth marks the transition from intrauterine support to independent existence, deciding when to sever this connection—immediate or delayed cord clamping—has become a critical focus in contemporary obstetric care¹.

The timing of umbilical cord clamping has been the subject of extensive research and ongoing debate. Immediate cord clamping was widely practised to expedite neonatal care or address maternal health concerns. However, emerging evidence has increasingly highlighted the safety and reliability of delayed cord clamping (DCC). This practice, which allows the cord to remain intact for 1-3 minutes after birth, has

enhanced neonatal iron stores, increased blood volume, and improved long-term health outcomes¹.

As perinatal care advances, understanding the optimal timing of cord clamping is becoming more important, emphasizing the profound implications these decisions hold for maternal and neonatal health. Particular attention is given to the adaptability of DCC in low-resource settings, where its low cost and significant health benefits make it an especially valuable and resourceful intervention².

Discussion

Placental transfusion

The umbilical cord, a vital structure in fetal development, consists of two arteries and one vein that facilitate the exchange of nutrients and waste between the fetus and the placenta. Its development begins around the third week of embryogenesis, with the umbilical cord forming from the connecting stalk that attaches the embryo to the decidua basalis. As the embryo folds during the fourth week, this stalk elongates and transforms into the primitive umbilical cord lined by the amnion. By the end of the third week, a functional vascular network is established within the cord, with the umbilical arteries and veins developing from the embryonic arterial and venous systems. As the fetus grows, the umbilical cord continues to elongate, reaching a length of 50 to 60 cm at birth. The cord's vessels, surrounded by Wharton's jelly, are coiled to provide resilience against compression and torsion, ensuring the cord's durability and functionality throughout pregnancy^{1 2}.

Fetal circulation is uniquely adapted to rely on the placenta for oxygenation, bypassing the non-functional lungs. A dramatic transition occurs at birth as the newborn takes its first breaths, leading to lung expansion and a sharp decrease in pulmonary vascular resistance. This shift allows blood to flow to the lungs for oxygenation, causing the closure of fetal shunts like the foramen ovale and ductus arteriosus. The timing of umbilical cord clamping (UCC) is crucial in supporting this transition².

Historically, early cord clamping, defined as within one minute of birth, was the norm in obstetric practice. However, emerging evidence has led to a shift in understanding, highlighting the benefits of delayed umbilical cord clamping (DCC). Early cord clamping cuts off placental blood flow before the baby's lungs are fully inflated, leading to a sudden increase in systemic vascular resistance and arterial pressure. This rapid rise in blood pressure and a decrease in blood flow to the left side of the heart can reduce cardiac output by up to 50% within the first 60 seconds, potentially leading to oxygen deprivation in vital organs, including the brain and intestines³.

In contrast, allowing the cord vessels to remain patent for at least 60 seconds after birth offers substantial benefits, particularly for preterm infants, by enhancing placental transfusion. This process can transfer up to 80-100 mL of blood to the newborn within the first three minutes after birth, increasing blood volume and stabilizing circulation². Delayed clamping significantly improves neonatal outcomes, supporting the newborn's early physiological adaptation and ensuring a smoother transition to independent life. Moreover, DCC allows for

immediate skin-to-skin contact, promoting bonding and early breastfeeding initiation without compromising the volume of placental transfusion³.

Historical Context and Early Observations

The debate over the timing of umbilical cord clamping has spanned centuries, dating back to Aristotle in 300 BC. In many wild animal species, mothers naturally allow the umbilical cord to remain attached until it dries out and detaches on its own, which can take several hours. This natural delay in cord separation provides the newborn with continued placental blood flow during the critical early moments of life. For example, in some species of primates, the mother leaves the cord attached until it naturally falls off. At the same time, dogs, cats, and certain herbivores chew through the cord only after licking and cleaning the newborn, allowing continued blood flow from the placenta. While the timing of cord separation in animals is often driven by practical needs—such as avoiding predators or cleaning the newborn—these examples illustrate a natural period of delayed cord separation, which could provide resilience and aid in the newborn's adaptation³.

Historically, human practices varied as well. In the time of Hippocrates, the umbilical cord was not cut until after the placenta was delivered, a practice rooted in observational wisdom. Midwives and traditional birth attendants recognized that waiting allowed the newborn to transition more smoothly to life outside the womb. In ancient and traditional societies, waiting until the cord stopped pulsating before clamping or tying it was common. For instance, in some Indigenous cultures, waiting until the cord

naturally ceased pulsating was customary, as it was observed that these babies were more likely to thrive. Erasmus Darwin³, in 1801, noted that tying and cutting the cord too soon was detrimental to the child and advocated for waiting until all pulsation had ceased. Similarly, Prof. Velpeau, in his 1829 *Treatise on Midwifery*, observed that the placenta should be separated from the uterus before the cord is prudently cut, allowing the newborn's circulation to adapt to extrauterine life gradually⁴.

Despite these early observations favouring delayed cord clamping, the 18th and 19th centuries saw a shift towards more active management of childbirth, including immediate cord clamping. This shift reflected the increasing medicalization of childbirth, aimed at improving maternal outcomes, such as reducing the risk of postpartum haemorrhage and standardizing newborn care. Just as Prof. Velpeau praised the wisdom of the ancients, he also acknowledged the emergence of a new and modern practice among accoucheurs, midwives, and medical physicians, who believed that immediate cord clamping posed no inconvenience to the newborn and offered benefits to the mother. Physicians of the time argued that immediate clamping was necessary to prevent complications like jaundice or polycythaemia and to stabilize newborns who were not breathing well at birth. By the mid-20th century, early cord clamping within the first 15-30 seconds after birth had become standard practice in many Western countries⁵.

Re-Emergence of Delayed Cord Clamping

In the 1960s and 1970s, researchers began questioning the routine practice of early cord clamping. Clair Lotus Day 1974 popularized a practice known as "lotus birth", which leaves the umbilical cord attached to the placenta until it naturally dries and separates, which may take several days to weeks. Proponents believe this allows for a complete transfer of placental blood to the baby and promotes uninterrupted skin-to-skin contact between mother and child as part of a holistic approach to childbirth. A less radical way is to delay cord clamping until all immediate postpartum care of the mother is complete. In this approach, the placenta is placed next to the mother, and the cord is left intact until the appropriate time to cut it is deemed right, which can range from 15 minutes to 3 hours. This practice combines the benefits of delayed cord clamping with the advantages of maintaining a close physical connection between mother and newborn, supporting both physiological and emotional well-being^{4,5}.

Since then, evidence highlighting the physiological benefits of delayed umbilical cord clamping (DCC) has continued to emerge. DCC is defined as clamping the cord 1-3 minutes after birth. Delaying clamping allows the placenta to continue supplying blood to the newborn, enhancing the smooth transition from placental to pulmonary oxygenation. Early clamping cuts off placental blood flow before the baby's lungs are fully inflated, leading to a sudden increase in systemic vascular resistance and arterial pressure. This can reduce cardiac output by up to 50% within the first 60 seconds, potentially leading to

oxygen deprivation in vital organs, including the brain and intestines. In contrast, delaying clamping allows the baby to establish breathing before the cord is clamped, reducing these risks and enabling a smoother transition to autonomous lung function⁵.

DCC allows a significant amount of blood—up to 80-100 mL—to flow from the placenta into the newborn's circulatory system, increasing blood volume by up to 30% and providing crucial physiological benefits during the early moments of life. Studies have shown that DCC increases haemoglobin levels at birth and maintains higher levels at 24 to 48 hours of life. Improved haemoglobin concentration supports vital physiological processes, including stable blood pressure, heart rate, and tissue perfusion, contributing to better early neonatal adaptation. Research also suggests that infants who undergo DCC are more likely to breastfeed successfully, which is crucial for providing essential antibodies and nutrients in the first hour of life⁶.

Physiological Benefits and Long-Term Outcomes

Delayed cord clamping has been associated with numerous short- and long-term benefits. For term infants, DCC increases iron stores in the first few months of life, reducing the risk of iron deficiency—a critical factor for optimal cognitive, motor, and physical development. A meta-analysis published in *The Lancet* in 2013 demonstrated that DCC at 60 seconds increases iron stores in the first few months of life by 40-50 mg/kg of body weight, with infants less likely to have iron deficiency at 3-6 months. This is particularly important in

low-resource settings where dietary iron supplementation may not be readily available^{6 7}. The extended placental transfusion during DCC also allows for the transfer of immunoglobulins and stem cells, which are essential for tissue and organ repair and may protect against chronic lung disease, asthma, diabetes, cerebral palsy, infection, and neoplasms⁷.

Long-term studies have shown emerging evidence that DCC may have lasting positive effects on neurodevelopment. For example, a follow-up study published in *JAMA Paediatrics* in 2015 indicated that children who had DCC at birth scored higher on fine motor and social-emotional developmental assessments at four years old than those who had early clamping. Additionally, research by Mercer et al., using novel MRI techniques, found that infants with DCC had enhanced myelin formation in their brain, likely due to larger iron stores, which improved motor function, communication, visual and spatial skills, and sensory processing in the first year of life^{8 9}.

The benefits of delayed cord clamping are particularly pronounced in preterm infants. A 2012 systematic review found that DCC for 30 seconds was associated with a lower need for transfusions, reduced incidence of intraventricular haemorrhage and necrotizing enterocolitis, and no significant increase in the need for phototherapy. A randomized controlled trial published in *The New England Journal of Medicine* in 2017 found similar results, with a significantly lower risk of severe IVH in preterm infants who had DCC compared to those who had early clamping. An Australian-led study at the University of Sydney found that delaying clamping in very premature babies

continues to have benefits two years on, decreasing the child's risk of death or major disability in early childhood by 17 per cent and reducing the need for blood transfusions⁹.

Concerns and Challenges

Despite the growing support for DCC, some concerns remain. One major concern is the potential delay in resuscitation efforts, particularly for preterm infants. In certain high-risk situations, such as when a newborn requires immediate resuscitation or in cases of fetal distress, early cord clamping may still be necessary¹⁰. However, advancements in neonatal resuscitation practices, including bedside resuscitation equipment, are making it increasingly possible to provide immediate care while delaying cord clamping.

Another concern is the risk of excessive placental transfusion, leading to conditions like polycythaemia or jaundice. However, recent studies, including one published in *Paediatrics* in 2015, found no significant difference in the need for phototherapy between infants who underwent DCC and those with early clamping. While DCC may slightly increase bilirubin levels, it does not significantly increase the incidence of clinically relevant jaundice requiring treatment. Additionally, DCC may not be possible if the placental circulation is not intact, such as in cases of haemorrhagic complications of labour (e.g., placental abruption, placenta previa) or cord abnormalities (e.g., true knot, prolapse, nuchal loops). In multiple gestations with placental connections (e.g., monochorionic placentation, twin-twin transfusion syndrome), time delays for placental

transfusion may pose risks to the second twin¹².

Concerns also arise regarding maternal outcomes, particularly the risk of postpartum haemorrhage. However, reviews of multiple trials have shown no significant increase in total blood loss or the need for transfusions associated with DCC. Some studies suggest a small but statistically significant decrease in umbilical artery pH with DCC. However, a larger study of 116 infants found no difference in pH levels and confirmed increased umbilical artery pO₂ levels in infants with DCC¹¹.

Another issue facing DCC is its impact on cord blood banking. DCC leads to a marked decrease in the collected blood volume and the number of nucleated hematopoietic precursor cells, which may be significant when parents plan to donate umbilical cord blood. However, without an explicit cause for donation, the benefits to the infant of receiving additional blood volume at birth likely exceed the potential benefits of banking for possible use¹².

Global Guidelines on Delayed Cord Clamping

World Health Organization (WHO) Guidelines

- The WHO strongly recommends DCC for all births, including preterm and term deliveries, suggesting clamping the cord after 1 to 3 minutes to allow for continued placental transfusion. This is particularly important in low-resource settings where maternal and neonatal anaemia is prevalent, and access to iron supplements and other treatments may be limited. While DCC should be the

standard practice, the WHO guidelines note that DCC should be balanced with the requirement for immediate neonatal care in situations where the newborn is in distress¹⁴.

American College of Obstetricians and Gynaecologists (ACOG) Guidelines

- ACOG supports DCC with a recommended delay of at least 30 to 60 seconds for both term and preterm infants. This timing allows optimal blood transfer from the placenta to the newborn. ACOG advises that DCC should be performed unless immediate resuscitation or other urgent interventions are necessary^{13 17}.

National Institute for Health and Care Excellence (NICE) Guidelines

- NICE recommends clamping the umbilical cord no earlier than 1 minute after birth unless the baby's heart rate is below 60 beats per minute and not improving with other interventions. The guidelines emphasize the importance of DCC in reducing the risk of iron deficiency anaemia, particularly in populations with limited access to postnatal care¹⁶.

International Liaison Committee on Resuscitation (ILCOR) Guidelines

- ILCOR recommends DCC for most vigorous newborns. For newborns requiring resuscitation, the cord should be clamped and cut to allow for rapid initiation of resuscitation, but in other cases, a delay in cord clamping is encouraged. ILCOR highlights that DCC is associated with better blood

pressure stability, higher blood volume, and reduced need for transfusions for preterm infants. However, they note that in cases of non-vigorous infants or those requiring immediate resuscitation, earlier clamping may be necessary¹⁵.

European Resuscitation Council (ERC) Guidelines

- The ERC recommends that DCC be practised in both term and preterm infants unless immediate neonatal resuscitation is needed. A delay of at least 1 minute is suggested, particularly to reduce intraventricular haemorrhage and improve circulatory stability in preterm infants. The ERC also discusses how DCC can be integrated into situations requiring neonatal resuscitation, suggesting that care teams prepare for a rapid transition from DCC to resuscitation when necessary⁶.

Summary of Key Points Across Guidelines

Across all these leading organizations¹⁴, there is a consensus that DCC should be the standard of care for most births, with timing recommendations generally ranging from 30 seconds to 3 minutes. The guidelines uniformly highlight DCC's role in improving neonatal outcomes, particularly in increasing blood volume and iron stores, which are critical in preventing neonatal anaemia and promoting healthy development¹⁴. Exceptions may be necessary, particularly in cases of neonatal distress where immediate intervention is required. The need to balance the benefits of DCC with potential risks, such as jaundice, is a common theme. In low-resource settings, the guidelines underscore DCC as a

low-cost, effective intervention that can significantly improve neonatal health outcomes, particularly where other resources might be limited.

Conclusion

This review demonstrates a strong consensus among leading health organizations that delayed umbilical cord clamping (DCC) should be the standard of care for most births, with timing recommendations generally ranging from 30 seconds to 3 minutes.

DCC represents a significant advancement in neonatal care, offering multiple benefits for term and preterm infants. The physiological process of placental transfusion during DCC is a natural and highly beneficial mechanism that increases neonatal blood volume, enhances oxygenation, and provides essential iron stores. By allowing more time for this transfusion, DCC supports the newborn's transition to life outside the womb, fosters successful breastfeeding, and lays the foundation for healthy development.

While exceptions may be necessary, particularly in cases of neonatal distress where immediate intervention is required, the overall benefits of DCC mean that healthcare providers can utilize this cost-effective and impactful intervention across a wide range of birthing environments, from well-resourced hospitals to rural clinics, making it easily implementable from the very beginning of life for both term and preterm infants, ensuring sustained health outcome benefits where they matter most, especially in low-resource settings.

References

1. Yao AC, Moinian M, Lind J. Distribution of blood between infant and placenta after birth. *The Lancet*. 1990; 293(7606):871-873.
2. Gunther M. The transfer of blood between the baby and the placenta in the minutes after birth. *The Lancet*. 1957;290(79):1277-1280.
3. Philip AGS, Saigal S. When should we clamp the umbilical cord? *NeoReviews*. 2004;5(4)
4. Rabe H, Diaz-Rossello JL, Duley L, Dowswell T. Effect of timing of umbilical cord clamping and other strategies to influence placental transfusion at preterm birth on maternal and infant outcomes. *Cochrane Database of Systematic Reviews*. 2012;8
5. McDonald SJ, Middleton P, Dowswell T, Morris PS. Effect of timing of umbilical cord clamping of term infants on maternal and neonatal outcomes. *Cochrane Database of Systematic Reviews*. 2013;7
6. Committee on Obstetric Practice, American College of Obstetricians and Gynecologists. Committee Opinion No. 84: Delayed umbilical cord clamping after birth. *Obstetrics & Gynecology*. 2017;129(1)
7. Andersson O, Hellström-Westas L, Andersson D, Domellöf M. Effect of delayed vs early umbilical cord clamping on iron status and neurodevelopment at age 4 years: A randomized clinical trial. *JAMA Pediatrics*. 2015;10(7):81 -88 .
8. Mercer JS, Erickson-Owens DA, Graves B, Haley MM. Evidence-based practices for the fetal to newborn transition: Timing of cord clamping. *Neonatal Network*. 2007;26 4):251-257.
9. Mercer JS, Vohr BR, McGrath MM, et al. Delayed cord clamping in very preterm infants reduces the incidence of intraventricular hemorrhage and late-onset sepsis: A randomized, controlled trial. *Pediatrics*. 2006 117(4):1235-1242.
10. Farrar D, Airey R, Law GR, Tuffnell D, Cattle B, Duley L. Measuring placental transfusion for term births: Weighing babies with cord intact. *BJOG*. 2011;118(1):70-75.
11. Boere I, Roest AAW, Wallace E, et al. Umbilical blood flow patterns directly after birth before delayed cord clamping. *Archives of Disease in Childhood - Fetal and Neonatal Edition*. 2015;100(2)
12. Chaparro CM, Neufeld LM, Alavez GT, Cedillo RE, Dewey KG. Effect of timing of umbilical cord clamping on iron status in Mexican infants: A randomised controlled trial. *The Lancet*. 2006 36(9527):1997-2004.
13. Lozoff B, Beard J, Connor J, Barbara F, Georgieff M, Schallert T. Long-lasting neural and behavioral effects of iron deficiency in infancy. *Nutrition Reviews*. 2006 6(Suppl2)

14. WHO Guideline: Delayed Umbilical Cord Clamping for Improved Maternal and Infant Health and Nutrition Outcomes (2014):11;23-27
15. International Liaison Committee on Resuscitation (ILCOR) Guidelines Vol:12:20-28
16. National Institute for Health and Care Excellence (NICE) Guidelines 2021 :33 12-19
17. ACOG Committee Opinion No. 684. Delayed Umbilical Cord Clamping After Birth. Obstetrics & Gynecology. 2017;129(1)

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Umbilical Cord Milking: A Rapid Approach to Placental Transfusion

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Abstract:

Umbilical cord milking (UCM) is an alternative technique to delayed umbilical cord clamping (DCC) to enhance placental transfusion to the newborn quickly. The process involves manually squeezing the umbilical cord and rapidly pushing blood towards the infant, typically in less than 10–15 seconds. This method has garnered attention, particularly in situations where the recommended 60-second delay for DCC may be impractical or unsafe, such as when the newborn requires immediate resuscitation or when the mother is experiencing hemodynamic instability. Despite its potential benefits, UCM has not been as rigorously studied as DCC, and its safety and efficacy remain a subject of scrutiny.

Understanding Umbilical Cord Milking

As an obstetric practice, umbilical cord milking emerged as a variation of delayed cord clamping, a technique that physicians have considered since the 18th century. Delayed cord clamping was originally introduced to allow the umbilical cord to continue pulsating after birth, transferring more blood from the placenta to the newborn. This practice was believed to improve neonatal outcomes by increasing the infant's blood volume. The specific practice of umbilical cord milking, where

the umbilical cord is physically "milked" or squeezed to push blood toward the newborn before clamping, was developed more recently, particularly in the late 20th to early 21st century¹.

The fundamental purpose of UCM is to increase the infant's blood volume by quickly transferring blood from the placenta to improve hematologic outcomes such as haemoglobin levels and iron stores². UCM is performed by gently squeezing the umbilical cord and sliding the fingers towards the newborn in a series of movements, effectively "milking" the blood from the placenta to the infant. This process is repeated several times, depending on the length of the cord and the specific protocol being followed. The entire procedure is designed to be completed within a few seconds, making it an attractive option in emergencies where time is of the essence^{2,3}.

The appeal of UCM lies in its ability to offer the advantages of DCC in a significantly shorter timeframe. This rapid approach is particularly advantageous in clinical settings where the infant may require immediate medical intervention or in cases of maternal distress. For preterm infants, the benefits of umbilical cord milking are particularly pronounced⁴. These infants are vulnerable to complications from low blood volume, such

as cardiovascular instability and hypothermia, immediately after birth. By increasing blood volume, cord milking may also lead to higher haemoglobin and haematocrit levels, reducing the risk of iron deficiency anaemia and the need for blood transfusions. Improved iron stores from this additional blood volume are particularly beneficial for neurodevelopment^{4,5}.

Moreover, the procedure supports the transition from fetal to neonatal circulation by enhancing blood flow, which is critical during the immediate post-birth period. Due to these advantages, UCM has been introduced as a practical intervention in neonatal resuscitation guidelines, particularly in settings where immediate care is essential. Its minimal equipment requirements also make it accessible in resource-limited environments⁴.

Evidence from Clinical Studies

A 2015 trial comparing delayed cord clamping (DCC) with UCM in term infants found that both methods resulted in similar haemoglobin and ferritin levels, suggesting that UCM could serve as a viable alternative to DCC in situations where time is critical. Long-term studies on UCM have shown no significant differences in neurodevelopmental outcomes at 2 and 3.5 years compared to DCC. These findings support the potential use of UCM in certain circumstances; however, it is essential to consider the associated risks. Like DCC, UCM has been linked to over-expansion of red cell volume, which may increase the risk of polycythaemia and hyperbilirubinemia, leading to neonatal jaundice⁵.

For preterm infants, the evidence on UCM is mixed, leading to ongoing discussions about

its safety and efficacy. A meta-analysis of seven studies involving 501 preterm infants compared UCM with either immediate cord clamping or DCC and found that UCM was associated with higher haemoglobin levels and a decreased incidence of intraventricular haemorrhage⁷ without a significant increase in adverse effects. However, the studies varied widely in their methodologies, including differences in the number of times the cord was milked, the length of the cord involved, and the type of delivery. For example, a 2015 trial focusing on infants born by caesarean section before 32 weeks' gestation found that UCM was linked to higher haemoglobin levels and improved blood pressure, benefits not observed in those born vaginally. In the case of extremely preterm infants (23–27 weeks of gestation), a 2019 study raised concerns that rapid or abrupt blood infusion through UCM might increase the risk of intraventricular haemorrhage^{4,5,6}.

While UCM shows promise as an alternative to DCC, particularly in time-sensitive situations, it is crucial to carefully weigh its benefits against potential risks, especially in vulnerable preterm populations⁷.

Conclusion

Umbilical cord milking (UCM) presents a promising alternative to delayed umbilical cord clamping (DCC), particularly in scenarios where immediate intervention is necessary, such as in cases of maternal instability or when the newborn requires urgent resuscitation. The procedure's ability to quickly deliver hematologic benefits similar to DCC makes it an attractive option in time-critical situations.

However, the evidence supporting UCM is mixed, especially in extremely preterm infants where the risk of complications, such as intraventricular haemorrhage, may be heightened by the rapid infusion of blood. This underscores the need for caution and careful consideration of the specific clinical context when opting for UCM. While the technique holds potential, the decision to utilize UCM should be made on a case-by-case basis, carefully considering both the benefits and possible risks.

Healthcare providers should remain vigilant and monitor care outcomes until more definitive guidelines are established through future research.

References

1. Andersson O, Hellström-Westas L, Andersson D, Domellöf M. Effect of delayed vs early umbilical cord clamping on iron status and neurodevelopment at age 4 years: A randomized clinical trial. *JAMA Pediatrics*. 2015;110 (7):61 -68.
2. Mercer JS, Erickson-Owens DA, Graves B, Haley MM. Evidence-based practices for the fetal to newborn transition: Timing of cord clamping. *Neonatal Network*. 2007;26 (4):251-257.
3. Mercer JS, Vohr BR, McGrath MM, et al. Delayed cord clamping in very preterm infants reduces the incidence of intraventricular hemorrhage and late-onset sepsis: A randomized, controlled trial. *Pediatrics*. 2006 117(4):1235-1242.
4. Farrar D, Airey R, Law GR, Tuffnell D, Cattle B, Duley L. Measuring placental transfusion for term births: Weighing babies with cord intact. *BJOG*. 2011;118(1):70-75.
5. Boere I, Roest AAW, Wallace E, et al. Umbilical blood flow patterns directly after birth before delayed cord clamping. *Archives of Disease in Childhood - Fetal and Neonatal Edition*. 2015;100(2)
6. Chaparro CM, Neufeld LM, Alavez GT, Cedillo RE, Dewey KG. Effect of timing of umbilical cord clamping on iron status in Mexican infants: A randomised controlled trial. *The Lancet*. 2006 368(9527):1997-2004.
7. Lozoff B, Beard J, Connor J, Barbara F, Georgieff M, Schallert T. Long-lasting neural and behavioral effects of iron deficiency in infancy. *Nutrition Reviews*. 2006 64(Suppl2)

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Factors affecting successful completion of the neonatal hearing screening test (Otoacoustic Emission Test) in the first attempt in healthy term newborns prior to discharge from the hospital.

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ABSTRACT

Introduction

Hearing loss is one of the most prevalent congenital disorders in neonates. Infants with untreated hearing loss usually struggle greatly in terms of emotional, social, and verbal development. Early identification via neonatal hearing tests and preventive strategies have been advised in order to lessen the negative impacts of congenital hearing loss on the infant's life.

Objectives

To assess the factors affecting the success of performing an otoacoustic emissions(OAE) test in stable term neonates.

Methodology

A descriptive type of cross sectional study was carried out at Sri Jayewardenepura Hospital from 01/06/2022 to 01/09/2022. All healthy term neonates were included, and preterm and neonates associated with other medical conditions were excluded.

Results

Out of 455 neonates, 422 (92.7%) were able to successfully complete the OAE test. 85.1% (n = 36) had a bedside sound level of 60dB -65 with a mean value of 62.8 dB at the time of OAE testing (p = 0.030). 134

(29.5%) neonates were breastfed (p = 0.281) and the majority of the newborns (n=36, 80.7%) were sleeping (p = 0.46) during the OAE test. Considering the factors affecting the successful outcome of the OAE testing, there is a statistically significant association with crying (p<0.001,OR(95% CI) = 0.026 (0.010- 0.068)), struggling (p = 0.003), OR (95% CI) = 0.194 (0.58 - 0.47) , debris in the external ear (p<0.001) with OR (95% CI) = 0.019 (0.005 - 0.75), throat secretions (p <0.001), and OR (95% CI) of 0.122 (0.034 - 0.442), external ear abnormalities (p = 0.005), and OR (95% CI) = 0.169(0.041 - 0.86) .

Conclusion

Crying, struggling, debris in the external ear, throat secretions, external ear abnormalities, and the sound level (dB) at the time of the test are the factors that are statistically significantly associated with the success of the OAE test. Thus, to achieve a successful OAE test, it is pivotal to keep the baby in a calm state with an optimal bedside sound level.

Key words: *otoacoustic emissions(OAE) test, hearing loss*

INTRODUCTION:

Hearing loss is one of the most prevalent congenital disorders in neonates. Congenital bilateral hearing loss affects one infant out of every 1000, according to the statistics^[1,2]. Infants with untreated hearing loss usually struggle greatly in terms of emotional, social, and verbal development^[3,4]. Early identification and preventive strategies have been advised in order to lessen the negative impacts of congenital hearing loss on the infant's life^[4]. In the majority of developed nations, newborn screening for congenital hearing impairments is a standard requirement. In the majority of developed nations, newborn screening for congenital hearing impairments is a standard requirement. Sri Lanka's Ministry of Health suggested commencing this practice in 2019^[5]. Hearing screening for newborns should be a regular part of the national program for preventing deafness, which is now under process. This has since been implemented at 9 hospitals in Sri Lanka^[5]. Many investigations have revealed that impairment brought on by infant hearing loss is frequently irreversible^[6]. Early acoustic stimulation, especially before the age of six months, increases nerve connections and, as a result, improves the recovery of auditory pathways^[7]. The strategy that has been employed the most frequently so far is a hospital-based screening program that uses a team of committed screeners to measure otoacoustic emissions (OAE) in newborns before discharge. Early identification encourages the earliest possible cochlear implant or hearing aid treatment for newborns^[8]. Determining the factors affecting the successful performance of the OAE testing may pave the way towards enhancing the outcome of the screening tests^[8]. Thus, the

objective of this study is to assess the factors affecting the ability to successfully perform the OAE test before discharge.

METHODOLOGY:

A descriptive cross sectional study was carried out at the postnatal wards and neonatal intensive care unit in Sri Jayewardenepura Hospital from January 2022 to September 2022. Neonates in the postnatal ward and admitted to SCBU for observation were included, and preterm and neonates associated with other medical conditions were excluded from the study. Senior Registrar in neonatology was involved in examining and selecting neonates for this study. Healthy babies admitted to the Special care bay unit (SCBU) were usually those who are overall in good health but require close monitoring and need special care due to specific conditions or circumstances that may not necessarily involve severe illness or critical conditions. Monitoring including respiratory monitoring, glucose monitoring and stable babies requiring minor medical interventions such as phototherapy.

In our study, distortion product otoacoustic emissions (DPOAE) were used for monitoring cochlear function. A trained technician from the ENT unit was assigned to perform the test according to the Sri Lankan guidelines for newborn screening for congenital deafness^[5]. A clinician attended each test, to take written informed consent and observe the test. Testing was not attempted prior to 12 hours of life and was done between 24-72 hours of life. Babies born through cesarean section waited 24 hours for the first attempt.

Preparing babies for the Otoacoustic Emission (OAE) test involved ensuring that the conditions are optimal for accurate results. Steps of preparing healthy term newborns for the neonatal hearing screening test were as followed. Ensuring was done that the baby is healthy and not experiencing any temporary conditions that might affect hearing, such as fluid in the ears from birth. The baby was selected mainly during sleep or after the breastfed where the baby was more likely to be calm and sleepy. The baby was placed in a comfortable position, such as being cradled in the arms or lying in a bassinet. The baby's head was supported to ensure it remains still during the test. Baby's mother was allowed to stay close or hold the baby if it helps keep the baby calm. Then

OAE test was conducted in a gentle manner. Continuously monitoring was done to check the baby's behavior and comfort, pausing if the baby becomes too restless or agitated.

Bedside sound levels (dB) at the time of the test were assessed by a standard sound level meter phone application. The factors influencing the successful performance of OAE were assessed. The data was analyzed using the SPSS 29 version. The chi-sq are test was used for comparison between groups. The odds ratio (OR) and confidence interval (95% CI) was calculated. The statistical significance was considered when the p value <0.05. The ethical approval was obtained from the ethical review committee of Sri Jayewardenepura General Hospital.

RESULTS:

Table 01: Outcome of OAE Testing

Outcome	Percentage
Successful OAE Testing	92.7 % (N=422)
Unsuccessful OAE Testing	7.3 % (N=33)

Out of 455 newborns, 422 (92.7%) were successfully completed the OAE test, only 33 (7.3%) were unsuccessful.

Table 02: Association between the factors affecting the ability to successfully perform OAE Test before discharge.

		Successful	Unsuccessful	Total	P value	OR (95CI%)
Age of the baby at OAE testing	24 hours	196 (43.10%)	20 (4.40%)	216 (47.50%)	.432	.479 (.077 - 3.001)
	48 hours	98 (21.50%)	8 (1.80%)	106 (23.30%)	.550	1.582 (.353 -7.103)
	72 Hours	31 (6.80%)	2 (0.40%)	33 (7.30%)	.773	1.26 (.255 -6.275)
	> 72 Hours	97 (21.30%)	3 (0.70%)	100 (22.00%)		
Mode of Delivery	LSCS	245 (53.80%)	17 (3.70%)	262 (57.60%)	.46	.78 (.378 -1.561)
	NVD	177 (38.90%)	16 (3.50%)	193 (42.40%)		
Presence of external ear anatomical abnormalities	No	415 (91.20%)	30 (6.6%)	445 (97.80%)	.013	.10 (.041 - .86)
	Yes	7 (1.50%)	3 (0.70%)	10 (2.20%)		
Debris in the external ear	No	419 (92.10%)	24 (5.30%)	443 (97.40%)	.001	.019 (.005 -.075)
	Yes	3 (0.70%)	9 (2.00%)	12 (2.6%)		
Throat secretions	No	415 (91.20%)	29 (6.40%)	444 (97.6%)	.001	.122 (.034 - .442)
	Yes	7 (1.50%)	4 (0.90%)	11 (2.40%)		
State	Alert	80 (17.6%)	8 (1.80%)	88 (19.30%)	.46	1.38 (.595 -3.145)
	Sleeping	342 (75.20%)	25 (5.50%)	367 (80.70%)		
Crying	No	413 (90.80%)	18 (4.00%)	431 (94.70%)	.001	.026 (.010 -.08)
	Yes	9 (2.00%)	15 (3.30%)	24 (5.30%)		
Struggling	No	411 (90.30%)	29 (6.40%)	440 (96.70%)	.008	.194 (.058 - .47)
	Yes	11 (2.4%)	4 (0.90%)	15 (3.3%)		
Breast feeding	No	295 (64.80%)	26 (5.70%)	321 (70.50%)	.285	1.599 (.67 -3.779)
	Yes	127 (27.90%)	7 (1.50%)	134 (29.50%)		

The majority of the newborns (n = 216 47.5%) were 24 hours old, followed by 48 hours (n = 106 23.3%) and >72 hours (n = 100, 22.0%). Only 33 newborns (3.3%) were older than 72 hours. Among our study participants, a slightly higher number of newborns were delivered via LSCS (n= 262 , 57.6%) and 193 newborns (42.4 %) via

NVD. Only 12 newborns (2.6%) had external ear abnormalities among the study participants. Among the newborns in our study, only 12 (2.6%) had debris in the external ear. Almost all newborns (n = 444, 97.6%) did not have throat secretions at the time of OAE test. Considering the status of the baby during the OAE test, it was found

that the majority of the newborns (n = 36, 80.7%) were sleeping, 94.7% were not crying, and 96% were not struggling at the

time of the test. Furthermore, 134 (29.5%) neonates were breastfed during the OAE test.

Table 3 : Bedside sound levels (dB) at the time of the test

Sound Level (dB)	N=%	Mean	SD
50dB-60dB	8.6% n=39	6.8	2.057
60dB -6	85.1% n=36		
>6	6.3% n= 51		

85.1% (n = 36) had a bedside sound level of 60dB-6 with a mean value of 6.8 dB at the time of OAE testing.

DISCUSSION:

Hearing loss is one of the most prevalent congenital disorders in neonates. Congenital bilateral hearing loss affects one infant out of every 1000, according to the statistics [8,9]. Infants with untreated hearing loss usually struggle greatly in terms of emotional, social, and verbal development [10,11]. Early identification and preventive strategies have been advised in order to lessen the negative impacts of congenital hearing loss on the infant's life [11].

The potential links between maternal/newborn characteristics and false-positive neonatal hearing screening tests have been explored in several studies. Our study results do not show any statistically significant association between the age of the baby and the success of the OAE testing. This is consistent with findings from other research indicating that the timing of the OAE test does not significantly alter its outcome [12].

Our study results demonstrated statistical significance in the presence of external ear anatomical abnormalities (p=0.013), debris in the external ear (p=0.001), throat secretions (p=0.001), crying (0.001) and struggling (0.008) for the test outcome. Gabbard et al. stated that, temporary circumstances in the external auditory canal, such as ear canal collapse, debris, and the presence of amniotic fluid and mesenchyme in the middle ear, could have an impact on OAE tests 24 to 48 hours after delivery [13,14]. The results of screening for OAE testing may also be severely impacted by environmental factors, such as excessive background noise in the testing area or test personnel's expertise and experience. Sometimes it was difficult to get the optimal noise levels for testing. While our study did not find significant differences based on age, Gabbard's work underscores the transient nature of certain factors impacting the test outcome shortly after birth.

When administering an OAE test, the majority of babies are usually calm, however it is possible to have a baby who is attentive and active or wailing. In these states, It is not recommended to try to assess a baby's hearing ^[15]. Our results demonstrated a statistically significant p value with the sound level (dB) at the time of the test ($p = 0.030$). OAE testing is based on identifying extremely faint sounds produced by the inner ear in response to stimuli. Excessive background noise can conceal these tiny emissions, resulting in erroneous measurements. Ensuring a calm testing setting helps maintain a good signal-to-noise ratio, which increases the accuracy of detecting otoacoustic emissions.¹⁸

Our study demonstrated that mode of delivery does not show statistical significance with the successful outcome of the OAE testing ($p = 0.46$). A study done in Turkey that screened 263 newborns to rule out successful OAE testing with the mode of delivery revealed that in both ways of delivery, the majority of the infants failed the first screening test while passing the test successfully in the OAE 2 stage. ^[16]. In contrast, Xiao et al. in a retrospective evaluation of the screening data of 1,46 newborns to evaluate the relationship between method of delivery and failure in the neonatal acoustic emission test and discovered considerably higher rates of failure in the first emission test among those born via C-section; When results were grouped by screening timing, infants born by C-section and screened within the first 42 hours after birth had significantly higher failure rates, whereas infants born by C-section and screened after 42 hours had higher failure rates but not statistically significant levels; Failure rates in OAE were shown to decrease in both modes of

delivery as the interval between birth and screening increased^[17].

In reviewing the screening findings of 1,63 children, Smolkin et al.^[18] discovered that infants born via C-section had considerably higher failed OAE readings than infants born via normal delivery, and they linked this result to amniotic fluid retention in the middle ear. These authors highlight that extending OAE screening beyond 48 hours after delivery will decrease failure rates^[18]. Our results demonstrated that the presence of external ear debris affects the successful completion of the OAE testing ($p < 0.001$, OR (95% CI) 0.019 (0.005 - 0.75). There may be debris in the ear canal, which may account for the first stage's significant false-positive rate ^[19]. Otoacoustic emissions may be distorted if the usual fetal middle ear fluid isn't cleared completely ^[20]. Akinpelu et al. discovered that there were significant drops in OAE levels at all frequencies when there was liquid in the middle ear. For larger liquid quantities, these effects become more pronounced. For the three lowest frequencies, changes in the noise level had a significant impact on the OAE signal-to-noise ratio ^[21]. This is in line with recent research by Voss et al., who demonstrated that wideband reflectance (WBR) increased as liquid volume in the middle ear rose at the majority of frequencies in cadaveric tests and mathematical models ^[22]. Majima et al. came to the conclusion that viscosity affects the way liquid affects middle-ear function, particularly below 1 kHz, although other investigations have found that viscosity has little to no impact ^[23-25]. In our study, breastfeeding status showed no significant association with OAE testing success ($p = 0.285$). The lack of correlation could imply that nutritional factors do not directly

influence auditory function in the immediate postnatal period. This finding is important for clinical practice, suggesting that feeding methods may not need to be prioritized when preparing for OAE testing. In this study, the timing of OAE testing did not demonstrate a statistically significant impact on the success of the assessments. While early testing remains a critical component of newborn hearing screening protocols, these findings suggest that testing conducted within the first few days of life can yield reliable results.

CONCLUSION:

Early diagnosis of hearing loss via neonatal screening tests and cochlear implantation is key to excellent outcomes. To achieve standard of care status, highlighting the importance of early intervention is essential. To conclude, our results showed a statistically significant association between crying, struggling, debris in the external ear, throat secretions, the presence of external ear abnormalities, and sound level (dB) at the time of the test. Thus, to achieve a successful OAE test, it is pivotal to keep the baby in a calm state with an optimal bedside sound level.

REFERENCES

1. Parving A. The need for universal neonatal hearing screening-some aspects of epidemiology and identification. *Acta Paediatr.* 2001;88:69-72. DOI:10.1111/j.1651-2227.1999.tb01168.x
2. Olusanya BO. Highlights of the new WHO Report on Newborn and Infant Hearing Screening and implications for developing countries. *Int J Pediatr Otorhinolaryngol.* DOI: 10.1016/j.ijporl.2011.01.036
3. Attias J, Al-Masri M, Abukader L, et al. The prevalence of congenital and early-onset hearing loss in Jordanian and Israeli infants. *Int J Aud.* 2006 45:528-536 DOI: 10.1080/14992020600810039
4. Smith R, Bale J, White K. Sensorineural hearing loss in children. *Lancet.* 2005;366: 879-90. DOI: 10.1016/S0140-6736(05)71047-3
5. Guidelines/Circular Letters. Family Health Bureau. Available from: <https://www.fhb.health.gov.lk/index.php/ta/resources/guidelines>
6. Sininger.Y.S, Doyle.K.J, and Moore.J.K. The case for early identification of hearing loss in children: auditory system development, experimental auditory deprivation, and development of speech perception and hearing. *Pediatric Clinics of North America.*1999;46 1:1-14 DOI: 10.1016/S0031-3955(05)70077-8
7. Yoshinaga-Itano C and Sedey A. Language, speech, and social emotional development of children who are deaf or hard of hearing: the early years, *The Volta Review.*2000;100:5:298
8. Valse D, Nagarathna HK. Efficacy of TEOAEs and BERA as screening tools for deafness in newborn. *Int J Otorhinolaryngol Head Neck Surg.* 2017;3(3):491-495.DOI: 10.18203/issn.2454-5929.ijohns2017264.

9. Qi B, Cheng X, En H, Liu B, Peng S, Zhen Y, Cai Z, Huang L, Zhang L, Han D. Assessment of the feasibility and coverage of a modified universal hearing screening protocol for use with newborn babies of migrant workers in Beijing. *BMC Pediatr.* 2013;13:116 DOI: 10.1186 1471-2431-13-116.
10. Crouch E, Probst J, Bennett K. Evaluating loss to follow-up in newborn hearing Screening in a southern state. *JEHDI.* 2017;2(1):40–47. DOI: [10.15142/T3T33Z](https://doi.org/10.15142/T3T33Z)
11. Yousefi J, Ajalloueyan M, S Amirsalari S, Hassanali Fard M. The specificity and sensitivity of transient Otoacoustic emission in neonatal hearing screening compared with diagnostic test of auditory brain stem response in Tehran hospitals. *Iran J Pediatr.* 2013;23(2):199–204. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC36313/>
12. Schwarz Y, Kaufman GN, Daniel SG. Newborn hearing screening failure and maternal factors during pregnancy. *Int J Pediatr Otorhinolaryngol.* 2017;103:65–70. DOI: 10.1016 j.ijporl.2017.09.027
13. S.A. Gabbard, J.L. Northern, C. Yoshinaga-Itano, Hearing screening in newborns under 24 hours of age, In *Seminars in hearing*, Thieme Medical Publishers, Inc. 1999;20: 291-304
14. Akinpelu OV, Peleva E, Funnell WRJ, Daniel SJ. Otoacoustic emissions in newborn hearing screening: A systematic review of the effects of different protocols on test outcomes, *Int. J. Pediatr. Otorhinolaryngol.* 2014; 78:711-717.
15. Olusanya BO, Bamigboye BA. Is discordance in TEOAE and AABR outcomes predictable in newborns. *Int. J. Pediatr. Otorhinolaryngol.* 2010; 74:1303-1309
16. Guven, S.G. The effect of mode of delivery on newborn hearing screening results. *Turkish Archives of Otorhinolaryngology.* 2019; 57(1), pp. 19–23. DOI: 10.5152/tao.2019.3940.
17. Xiao T, Li Y, Xiao L, Jiang L, Hu Q. Association between mode of delivery and failure of neonatal acoustic emission test: a retrospective analysis. *Int J Pediatr Otorhinolaryngol* 2015; 79: 516-9. DOI: 10.1016 j.ijporl.2015.01.019.
18. Smolkin T, Mick O, Dabbah M, Blazer S, Grakovsky G, Gabay N, et al. Birth by cesarean delivery and failure on first otoacoustic emissions hearing test. *Pediatrics* 2012; 130: e95-100. DOI: 10.1542/peds.2011-3179.
19. Tzanakakis MG, Chimona TS, Apazidou E, Giannakopoulou C, Velegrakis GA, Papadakis CE. Transitory evoked otoacoustic emission (TEOAE) and distortion product otoacoustic emission (DPOAE) outcomes from a three-stage newborn hearing screening protocol. *Hippokratia.* 2016 Apr-Jun;20(2):104-109.
20. Ng PK, Hui Y, Lam BC, Goh WH, Yeung CY. Feasibility of implementing a universal neonatal hearing screening programme using distortion product otoacoustic emission detection at a university hospital in Hong Kong. *Hong Kong Med J.* 2004;10:6–13.

21. Akinpelu OV, Funnell WR, Daniel SJ. Detection of otoacoustic emissions in chinchilla when the middle ear contains amniotic fluid. *Laryngoscope*. 2015;125:E138–E142. DOI: 10.1002/lary.24914.
22. Voss SE, Merchant GR, Horton NJ. Effects of middle-ear disorders on power reflectance measured in cadaveric ear canals. *Ear Hear* 2012;33: 195–208. DOI: 10.1097/AUD.0b013e31823235b5.
23. Majima Y, Hamaguchi Y, Hirata K, Takeuchi K, Morishita A, Sakakura Y. Hearing impairment in relation to viscoelasticity of middle ear effusions in children. *Ann Otol Rhinol Laryngol* 1988;97:272–274. DOI: 10.1177/000348948809700311.
24. Brown DT, Marsh RR, Potsic WP. Hearing loss induced by viscous fluids in the middle ear. *Int J Ped Otorhinolaryngol* 1983;5:39–46. DOI: 10.1016/s0165-5876(83)80006-8.
25. Marsh RR, Baranak CC, Potsic WP. Hearing loss and visco-elasticity of the middle ear fluid. *Int J Pediatr Otorhinolaryngol* 1985;9:115–120. DOI: 10.1016/s0165-5876(85)80011-2.

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DECLARATION OF CONFLICTS INTERESTS

The Authors declare that there is no conflict of interest

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Case Report

An unusual presentation of caudothalamic haemorrhage as fever in a term neonate

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Keywords: Intracranial haemorrhage; central fever; caudothalamic haemorrhage; hypothalamus

Introduction

Fever is a physiological response to infection or inflammation mediated through pyrogens(1). The thermogenic activity of pyrogens elevates the temperature set point at the hypothalamus, resulting in fever. Additionally, various other insults cause fever by altering the temperature set point. However, these are very rare, especially during the neonatal period(2). Here, we report a neonate with caudothalamic haemorrhage presenting with fever, causing a diagnostic dilemma.

Case presentation

A baby girl was delivered via forceps delivery at 38 weeks of gestation with a birth weight of 2.9kg. She cried at birth and had Apgar of 9 and 10 at 1 and 5 minutes. She developed respiratory distress with tachypnoea, nasal flaring, and grunting two hours after delivery and was admitted to the neonatal intensive care unit (NICU). The antenatal period of the 36-year-old mother was uneventful. However, she had prolonged labour with dribbling for 15 hours, more than three vaginal examinations

post-rupture of membranes, and elevated c-reactive protein (CRP) of 26m g/L at the time of delivery. There was no maternal fever, foul-smelling liquor, fetal tachycardia or evidence of fetal distress at delivery. A presumptive diagnosis of early-onset neonatal sepsis was made. The baby was commenced on non-invasive continuous positive airway pressure, intravenous fluids and empirical antibiotics with intravenous penicillin and cefotaxime. Her respiratory distress settled, and she was weaned off to room air after 24 hours. Her full blood count and CRP on admission to the NICU were normal.

On day three of life, she developed fever spikes of 38°C and was found to be less active. The rest of the physical examination was unremarkable, with normal anterior fontanelle, pulse rate, mean arterial blood pressure, system examinations and pulse oximetry. Her head circumference was 34cm. Despite the appropriate dosage of paracetamol, her fever continued to spike above 38°C, requiring investigations to identify the cause of the fever (Figure 1).

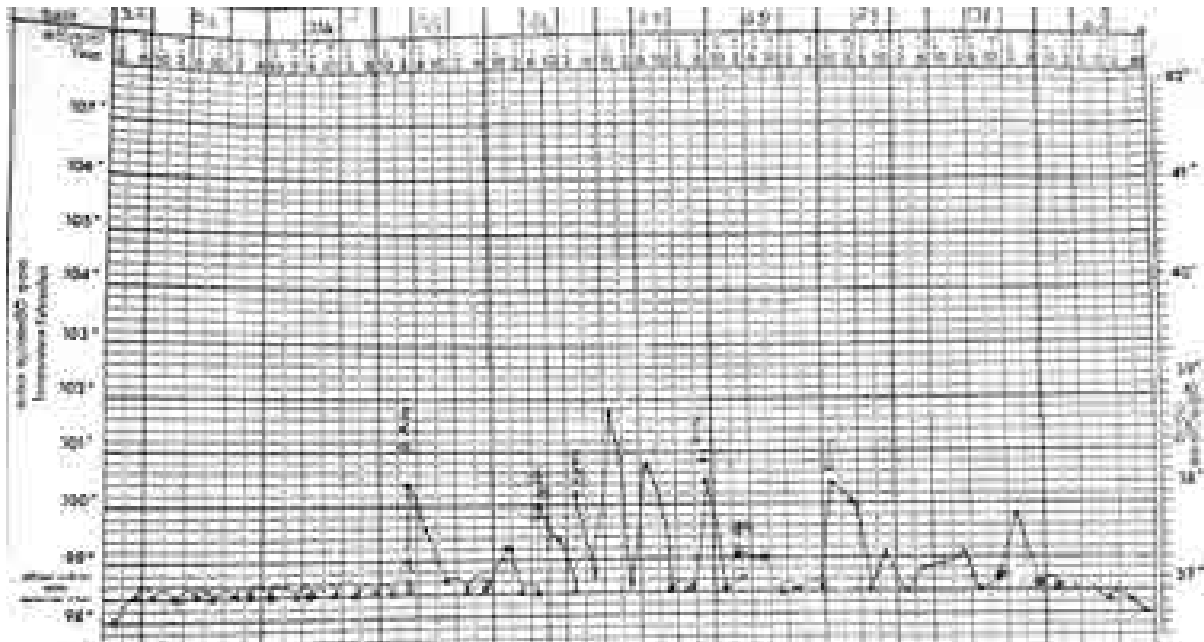


Figure 1 Image of the temperature chart showing prolonged fever

Investigations revealed normal full blood count, CRP, cerebrospinal fluid (CSF) analysis, chest x-ray, and abdominal ultrasonography. Her blood, urine and CSF cultures were negative, and the dengue NS1 antigen was negative. The echocardiogram revealed an uncomplicated ostium secundum atrial septal defect without evidence of infective endocarditis. Repeat full blood count and CRP on days five and seven of life were normal. The cranial ultrasonography on day seven revealed a 15mm x16mm haemorrhage in the right caudothalamic groove extending into the right lateral ventricle. Non-contrast computed tomography (NCCT) scan of the brain confirmed right caudothalamic haemorrhage (Figure 2). Her clotting profile was normal. Based on the absence of a septic focus, normal septic screening, and proximity of the haemorrhage to the

hypothalamic temperature set point, central fever caused by intracranial haemorrhage (ICH) was diagnosed.

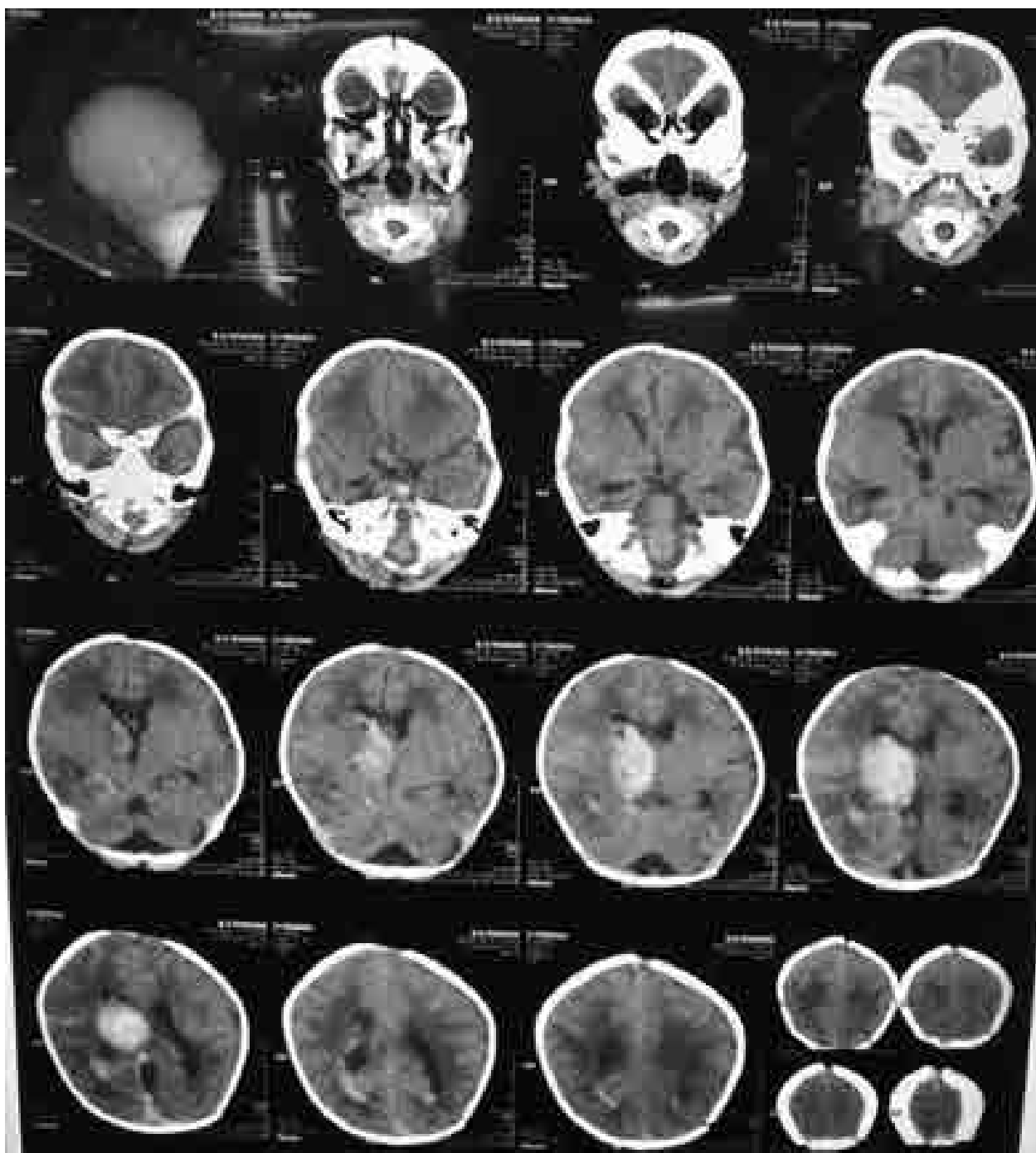


Figure 2 – NCCT brain showing right caudothalamic haemorrhage

The baby was referred for a neurosurgical opinion. The neurosurgical team advised conservative management by monitoring the consciousness and appearance of focal neurological signs or features of raised intracranial pressure. Over the next three days, the neonates showed clinical

improvement and did not show features of raised intracranial pressure or extension of the haemorrhage. The fever gradually subsided, antibiotics were discontinued, and breastfeeding was established. The neonate was discharged home on day 11 with a follow-up plan for occipitofrontal

circumference monitoring, developmental assessment, vision and hearing screening, and referral for developmental support services.

Discussion

Fever in neonates is commonly caused by dehydration or sepsis. ICH in term neonates is rare and is usually not considered a cause of fever(3). Caudothalamic region is the most common site of ICH in neonates particularly in preterm neonates. This is due to the highly vascular stress sensitive germinal matrix located in the caudothalamic groove. The usual presentations of caudothalamic haemorrhage in neonates are apnoea, seizures, decreased muscle tone, hypotension and coma(4). Here, we report a neonate with ICH involving the right caudothalamic region unusually presenting as prolonged fever.

The concept of fever originating centrally was initially delineated by Erickson in 1939 (5). ICH is believed to raise the hypothalamic temperature set point through various mechanisms, including direct damage to thermoregulatory centres in the preoptic region, stimulation of inflammatory responses leading to prostaglandin production, and reduced inhibitory feedback from the lower midbrain, which generally suppresses thermogenesis(6, 7). This diagnosis is typically made through the exclusion of other causes.

The neonate described in this case report was initially diagnosed to have early onset neonatal sepsis. She had risk factors for sepsis, including instrumental delivery, more than three vaginal examinations post-

rupture of membranes and elevated maternal CRP. However, her septic screen continued to produce negative results, and her fever failed to respond to paracetamol or intravenous antibiotics. This led us to consider causes for fever other than infection and inflammation, prompting us to do further investigations, including cranial ultrasonography, which led to the diagnosis of central fever due to ICH involving the right caudothalamic region.

In conclusion, this case report highlights the importance of considering causes for fever other than infection and inflammation in neonates, especially when infections are ruled out and fever continues. It also highlights that maintaining a high index of suspicion and prompt decision-making facilitates early identification of ICH, thus minimizing unnecessary investigations, side effects, and the risk of emerging antibiotic resistance associated with prolonged intravenous antibiotic use.

References

1. Walter EJ, Hanna-Jumma S, Carraretto M, Forni L. The pathophysiological basis and consequences of fever. *Crit Care*. 2016;20(1):200.
2. Rose E. Pediatric Fever. *Emerg Med Clin North Am*. 2021;39(3):37-39.
3. Fang SB, Chang YT, Chuo YH, Tsai ST, Tseng CL. Hyperthermia as an early sign of intracranial hemorrhage in full-term neonates. *Pediatr Neonatol*. 2008;49(3):71-6
4. Kliegman RM, Geme JS. Nelson Textbook of Pediatrics. 21st ed. Philadelphia: Elsevier; 2020.

5. Erickson TC. Neurogenic hyperthermia. 1934.
6. Honig A, Leker RR. Between a rock and hard place: fever and inflammation in intracerebral hemorrhage. *Eur J Neurol*. 2018;25(10):1195-6
7. Lin V, Tian C, Wahlster S, Castillo-Pinto C, Mainali S, Johnson NJ. Temperature Control in Acute Brain Injury: An Update. *Semin Neurol*. 2024.

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SECTION 2



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Published Abstracts

EVALUATING THE TIMELINESS AND COMPLIANCE OF THERAPEUTIC HYPOTHERMIA INITIATION AND ITS CORRELATION WITH EARLY BLOOD GAS PARAMETERS IN NEONATES WITH HYPOXIC ISCHEMIC ENCEPHALOPATHY AND THE FOLLOW-UP

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Introduction:

This audit examined the effectiveness of implementing therapeutic hypothermia in neonatal care and its impact on early blood gas parameters. Conducted in the NICU at Teaching Hospital Mahamodara from January to April 2024, the study aimed to evaluate adherence to established standards for hypothermia treatment in neonates. Key areas of focus included the initiation of total body cooling, the timeliness of blood gas analysis, monitoring of cerebral function, conducting repeat ultrasound scans, arranging follow-up clinics, and performing hearing screenings before discharge.

Objectives:

The primary objective was to evaluate adherence to therapeutic hypothermia protocols and early blood gas monitoring in neonates with HIE, identify compliance levels, and recommend improvements.

Method:

A prospective observational study was conducted, involving structured audits during a 3-month period. Data were collected from medical records using a standardized data collection form.

Results:

High compliance was observed in total body cooling initiation (100%), blood gas analysis within 1 hour (100%), repeat ultrasound scans before discharge (100%), follow-up clinic arrangements (100%), and hearing screenings (100%). However, there was a significant gap in the availability and use of cerebral function monitoring facilities (0%) and the timely conduct of cord blood gas analysis (5%).

Conclusion:

The audit highlighted high compliance in key areas of HIE management, such as therapeutic cooling initiation and prompt blood gas analysis, reflecting effective adherence to these protocols. Nevertheless, there are critical deficiencies in monitoring capabilities, particularly in cerebral function monitoring and cord blood gas analysis. These gaps indicate a need for improved infrastructure, including the acquisition of necessary scalp electrodes, enhanced staff training, develop and implement a guideline for resuscitated babies to ensure correct way of cord blood gas analysis and monitor stricter adherence to protocols by doing a re-audit. Addressing these issues is essential to ensure comprehensive care and improve outcomes for neonates with HIE.

NUTRITIONAL STATUS AND FEEDING PRACTICES OF NEONATES AND INFANTS WITH OROFACIAL CLEFTS WHO ARE ATTENDING TO MULTIDISCIPLINARY CLEFT CLINIC (MDCC), PLASTIC AND RECONSTRUCTIVE CLINIC AND ORTHODONTIC CLINIC AT LADY RIDGEWAY HOSPITAL COLOMBO.

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Introduction:

Cleft Lip (CL) with or without Cleft Palate (CP) and CP alone are collectively known as the Oro-Facial Clefts (OFCs). OFCs are known to be associated with several negative outcomes including feeding problems which cause nutritional impairment.

Objective:

To identify the feeding practices, nutritional status and its associated factors of neonates and infants with OFCs attending to tertiary care hospital in Sri Lanka

Methods:

A hospital based cross sectional study was conducted among a convenient sample of 102 neonates and infants with OFCs attending to Multidisciplinary Cleft Clinic, Plastic and Reconstructive clinic and Orthodontic clinic at Lady Ridgeway Hospital Colombo, Sri Lanka. In the assessment of the nutritional status, the growth charts of the babies incorporated in the Child Health and Development Record of the child were observed. The babies with either underweight, stunting, wasting or with both wasting and stunting were classified as the babies having poor nutritional statuses. Chi square test was used to find out the associations of nutritional status of neonates and infants with OFCs.

Results

Forty-two (41.2 %) children had CL with CP followed by CP (38.2%) and CL (20.6%) alone. Growth faltering (GF) was detected in 84.3%. Majority (82.4%) had poor nutritional status while 5.7% had Severe Acute Malnutrition (SAM). Feeding problems were common with OFCs, however it has statistically significantly reduced following surgical correction (90.2% vs 5.8%, $p<0.001$). Having feeding problems ($p=0.002$), being on formula milk ($p=0.002$), having CL with CP ($p=0.048$) and presence of GF ($p<0.001$) were associated with poor nutritional status. Surgical interventions have done for 41.2% and they were 58.0 times likely to have growth improvement following surgery.

Conclusion

Feeding problems with poor nutritional status are identified as a problem among neonates and infants with OFCs. Timely surgical correction with prompt nutritional intervention is recommended for ensure nutritional status among children with OFCs.

Key words: Oro-facial clefts, nutritional status, feeding practices, associated factors

AN AUDIT OF NEURODEVELOPMENTAL CARE PRACTICES FOR PREMATURE AND CRITICALLY ILL NEONATES IN THE NEONATAL INTENSIVE CARE UNIT AT TEACHING HOSPITAL KARAPITIYA, GALLE

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Introduction:

This audit assessed neurodevelopmental care practices in the NICU at Teaching Hospital Karapitiya over a 50-day period from May 1, 2024, to June 20, 2024. The audit aimed to evaluate compliance with established standards such as noise reduction, tactile stimulation, oral aversion minimization, protection from noxious odors, positioning, parental involvement, and light reduction. A total of 250 observations were conducted during ward rounds from 7 am to 7 pm.

Objectives:

The primary objective was to qualitative assessment of neurodevelopmental care standards, statistical analysis of compliance rates and highlight areas requiring improvement.

Method:

A prospective observational study was employed, involving structured audits during ward rounds. Observations were systematically recorded in a data collection sheet and analyzed to assess adherence to various care standards.

Results:

High compliance was observed in gentle handling, holding baby during feeding, avoidance of noxious odours, eye covers

during procedures and the use of incubator covers. However, significant gaps were identified in talking softly near warmers (50%), interventions when the baby is gently aroused, encouraging hand-to-mouth contact (60%), positioning practices: not keeping hands in 'W' position (6%), not keeping legs in 'M' position (6%), not turning head >45 degrees (6%), individual light with dimmers placed over the neonate (0%) and blind curtain to windows (0%) and paternal involvement (0%). These findings indicate a need for enhanced training, infrastructure improvements, and stringent policy implementation.

Conclusion:

The audit revealed both strengths and deficiencies in the neurodevelopmental care practices within the NICU. While certain standards were met consistently, others showed significant room for improvement. By addressing identified gaps through infrastructure upgrades, staff education and training, regular monitoring with reaudits and policy enforcement, the NICU can enhance its compliance with best practices. This will contribute to better neurodevelopmental outcomes for neonates and support the continuous improvement of care standards in the NICU setting.

KNOWLEDGE REGARDING NEONATAL ADVANCED LIFE SUPPORT AMONG INTERN MEDICAL OFFICERS – FOLLOWING PRE-INTERN ONLINE TEACHING

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Introduction:

Neonatal advanced life support (NALS) is a crucial factor in reducing the mortality and morbidity in birth asphyxia-related complications. Confidence & sound knowledge in NALS among intern medical officers are vital, as they may be the first contacts of newborn emergencies after completing the internship. All intern medical officers undergo a mandatory one-day training on NALS just prior to the beginning of the internship.

Objectives:

This study is designed to assess the knowledge of NALS among intern medical officers (IMO) after six months of the one-day NALS online teaching program.

Method:

This is an interviewer-administered questionnaire-based descriptive study done in IMOs after six months of the NALS online teaching program. IMOs from Sri Jayewardenepura General Hospital and Lady Ridgway Hospital for Children were included. Thirty questions assessed the participants' NALS knowledge covering 1) Preparation for resuscitation, 2) Initial assessment, intervention and reassessment, 3) Airway management, 4) Chest Compression, 5) Intravenous access and medication, and 6) Special situations. The questionnaire included 15 questions carrying 2 marks each, requiring compulsory correct responses to consider as

having adequate knowledge. Balance 15 questions carried one mark each. Marks were given out of 45

A Binary Logistic Regression model was used to assess adequate knowledge versus Age, Sex, Exposure, and Attention to the program. Percentages of successful answers calculated.

Results:

A total of 68 subjects were included. The majority were females, 50 (73.5%), and the mean age was 27.5 (range 26-31). Only 18 (27.27%) participants answered all mandatory questions correctly demonstrating adequate knowledge. The gender and age of the participants were not significantly associated with having satisfactory knowledge. However, exposure to real-life experience on NALS is significantly correlated ($P = 0.028$) with having adequate knowledge.

Conclusions:

Most IMOs have an inadequate knowledge of NALS. Experience involving NALS is associated with good knowledge. Most participants have poorer knowledge of cardiac compression technique, medications used, and resuscitation of babies born through Meconium-stained liquor. The majority of intern medical officers like to have another NALS programme (preferably hands-on) to refresh their knowledge.

RE-AUDIT ON THE DURATION OF THE KANGAROO MOTHER CARE PRACTICE AT THE NEONATAL UNIT CSHW

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Introduction:

Kangaroo Mother Care (KMC) is a world-recommended effective interventional practice that reduces the primary causes of preterm mortality and morbidity. This method is considered to be more effective, particularly in developing countries with limited access to resources associated with conventional neonatal care.

Objectives:

To assess the sustainability of existing KMC practice for all preterm and SGA babies admitted to the Neonatal Unit, CSHW, with adherence to the “Unit Policy” for KMC introduced and implemented since June 2023.

Methods:

In this study, we focused on all preterm and SGA babies admitted to the Neonatal unit, CSHW, from 01/11/2023 to 30/11/2023. The exclusion criteria of this study were mothers who were not clinically stable and babies on phototherapy. An in-depth analysis was conducted based on the data collected from the questionnaire completed by mothers and the interviewer-administered questionnaire with the health staff in the Neonatal unit. The deficiencies were addressed by implementing the following initiatives;

- Antenatal education and counselling
- Presenting KMC videos, posters and leaflets

- Providing KMC binder and jackets
- Conducting KMC workshops for healthcare staff
- Providing support during feeding

Results:

The “Unit Policy” for KMC has been introduced, given the KMC duration of 3 to 8 hours. However, initial re-audit results presented that the minimum KMC duration was less than 3 hours. With the implementation of new initiatives, the minimum KMC duration has increased to 6 hours, with the KMC practice level of 60 %.

Conclusions:

This study was significant in identifying the deficiencies in KMC practice and addressing maternal as well as health staff-related barriers. The minimum KMC duration has increased to 6 hours with the implementation of new initiatives but is still below the WHO recommendation of 8 hours. Hence, it is apparent the significance of introducing and implementing of National Policy for KMC to ensure the sustainability of KMC practice in Sri Lanka.

DOES BIRTH WEIGHT AFFECT INFANT BODY COMPOSITION? A LONGITUDINAL BODY COMPOSITION STUDY FROM BIRTH TO 2 YEARS IN HEALTHY BABIES BORN AT TERM IN COLOMBO, SRI LANKA

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Introduction:

Birth weight (BW) has been found to be a risk factor for obesity. This is the first study to describe the effect of BW on body composition (BC) in Sri Lankan infants from birth-2 years.

Objective:

To determine the effect of BW on the BC from birth to two years.

Methodology:

Descriptive longitudinal study, 2015-2019, at Professorial Unit, De Soysa Hospital for Women. Healthy, term babies born to mothers >18years of age, who agreed to attend monthly follow-up were enrolled (n=337). None developed any conditions affecting growth during the study. BW was measured within 12-24 hours of birth, to the nearest 5g, using 2-weekly calibrated, SECA 334 electronic weighing scale, according to WHO-MGRS protocol. BC i.e., fat-mass (FM) and fat-free-mass (FFM) was assessed at 3, 6, 12, 18 and 24 months of age by deuterium dilution method. Saliva was sampled pre-dose, 2.5 and 3 hours post-dose (deuterium=0.15mg/kg) and analysed using Fourier Transform Infrared Spectroscopy (Agilent 4500). Ethics clearance was obtained from Faculty of Medicine, University of Colombo. Longitudinal BC curves were drawn for <2.5kg, 2.5-3.5kg and >3.5kg BW categories using LMS

Chartmaker Pro(v2.54). Mean BC for each BW category was compared using independent sample t test. Pearson correlation was used to determine the relationship between BW and BC.

Results:

There were 55, 250 and 32 babies with BW <2.5kg, 2.5-3.5kg and >3.5kg respectively. Mean FFM was significantly higher in BW >3.5kg than 2.5-3.5kg [5.2(0.5)kg vs 4.6 0.6 kg, p=0.006] and BW 2.5-3.5kg than <2.5kg [4.6 0.6 kg vs 4.2(0.5)kg, p=0.002] from 3-9 months of age. Fat % was significantly higher in BW <2.5kg than >3.5kg at 9 months [21(8)% vs 14(5)%, p=0.032] and 24 months [18(1)% vs 11(4)%, p=0.016] of age. FFM% was higher in BW >3.5kg than 2.5-3.5kg than <2.5kg respectively, from 6-24 months of age. FM% was higher in BW <2.5kg than 2.5-3.5kg than >3.5kg respectively, from 6-24 months of age.

FFM showed a significant positive correlation to BW at 3, 9, 12, 18 and 24 months [r=0.46 p<0.001), r=0.54(p<0.001), r=0.26 p=0.024), r=0.3(p=0.03), r=0.35(p=0.01)] respectively.

Conclusion:

An increase in BW was associated with an increase in FFM, whereas <2.5kg BW babies had the highest FM% at 24 months of age.

GESTATION SPECIFIC NEONATAL MORTALITY FOR 2023/2024, IN A TERTIARY CARE NEONATAL UNIT, IN COLOMBO SRI LANKA,

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Introduction:

Identifying the cause of death is helpful in determining preventive strategies to reduce the neonatal mortality in Sri Lanka.

Objective:

To determine gestation specific neonatal mortality in a tertiary care neonatal unit in Colombo, Sri Lanka.

Method:

A retrospective study was conducted at University Unit, De Soysa Hospital for Women, Colombo on the neonatal deaths that occurred from 01.01.2023 to 30.05.2024. Permission was obtained from the head of the institution. Babies who were transferred out due to bed unavailability were excluded. Data was obtained from perinatal mortality presentations, perinatal death forms and birth and death registers. Microsoft Excel for Mac 2023 v1677.1 was used for statistical analysis.

Results:

There were 4485 live births and 30 neonatal deaths resulting in a neonatal mortality rate of 67 per 1000 live births. Most (n=18, 60%) deaths were due to prematurity. Mortality was 100% at 22 (one birth), 23 (4 births), and 24 (2 births) weeks gestation.

Mortality was 50% for 25 weeks (2 births, 1 death) and 20% for 26 weeks (5 births, 1 death) gestation. Mortality was 50% for 27 weeks (2 births, 1 death) and 28 weeks (6 births, 3 deaths), where deaths were due to intraventricular haemorrhage, pulmonary haemorrhage, placental abruption with hypoxic injury and group B streptococcus (GBS) sepsis on day one. Mortality was 6.5% at 31 weeks (15 births, 1 death due to coliform sepsis on day one), 5.6% at 32 weeks (18 births, 1 death due to non-immune hydrops), 6.3% at 33 weeks gestation (16 births, 1 death due to congenital abnormality) and 6.7% mortality at 35 weeks gestation (30 births, 2 deaths due to multiple congenital abnormalities and GBS sepsis on day one). No deaths occurred at 29, 30, 34 and 36 weeks gestation. Among the 12 deaths in term babies, one was due to GBS sepsis on day one (3.3%), 2 were due to severe hypoxic ischaemic encephalopathy (6.6%), whereas all others were due to congenital anomalies (30%).

Conclusion:

Prematurity was the leading cause of neonatal death with 100% mortality at 22-24 weeks, 20-50% mortality from 25-28 weeks, with a drastic drop to 0-6% from 29-36 weeks gestation.

PREVALENCE AND ASSOCIATED FACTORS OF HYPOTHERMIA AMONG NEONATES ADMITTED TO THE PREMATURE BABY UNIT (PBU) OF DISTRICT GENERAL HOSPITAL NAWALAPITIYA: A RETROSPECTIVE ANALYSIS

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Introduction and Objectives:

Hypothermia is defined as core body temperature being below 36° C. Though hypothermia is commonly associated with neonatal morbidity and mortality, relevant literature is limited in Sri Lanka. This study aimed to identify the prevalence and associated factors of hypothermia among neonates admitted to PBU of District General Hospital Nawalapitiya.

Methods:

Patient records of all neonates admitted to PBU from January 2021 to February 2022 were included by consecutive sampling. Axillary temperature on admission and clinical data were extracted. Data was analyzed using SPSS 25.0 software. Descriptive statistics were performed. The variables that were positive in bivariate analysis done using Chi square tests were included in a multivariable logistic regression analysis.

Results:

Among 407 neonates, the mean admission age was 5.2 days. Majority were males (52.6%) with a corrected gestational age of 37 weeks or above on admission (64%) and a mean weight of 2.44 kg. Prevalence of hypothermia was 38.6% (95%CI:33.9–43.4). Maternal factors like teenage pregnancy, multiple pregnancy, hypertension during pregnancy, premature rupture of membranes and lower-segment caesarian sections; neonatal factors like low

birth weight, prematurity, age on admission being ≤24 hours, weight on admission being <2500g, corrected gestational age on admission being <37 weeks and having been resuscitated at birth had statistically significant associations with hypothermia on bivariate analysis. Following multivariable analysis, only teenage pregnancy (Adjusted odds ratio(AOR):7.3, 95%CI:1.6-32.9), multiple pregnancy (AOR:2.8, 95%CI:1.1-7.1), hypertension in pregnancy (AOR:2.3, 95%CI:1.1-4.6), low birth weight (AOR:3.7, 95%CI:1.1-12.6) and age on admission being ≤24 hours (AOR:2.5, 95%CI:1.3-4.7) remained significant. Neonates with hypothermia had 5.1 times (95%CI:1.8-14.5) increased odds of mortality and 4.3 times (95%CI:2.5-7.4) increased odds of receiving ventilatory support compared to normothermic neonates. Hypothermia also showed statistically significant associations with infant respiratory distress syndrome, metabolic acidosis and neonatal jaundice. Hypothermia showed no significant association with the month/season of admission.

Conclusions:

Nearly two out of five neonates admitted to PBU were hypothermic. There were significant maternal and neonatal risk factors to be addressed. Hypothermia on admission may indicate serious neonatal morbidity and mortality.

KNOWLEDGE AND SKILLS IN NEONATAL RESUSCITATION AMONG HEALTHCARE PROFESSIONALS IN UVA PROVINCE, SRI LANKA: IMPACT OF THE NEONATAL LIFE SUPPORT PROGRAM.

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Introduction:

Neonatal resuscitation is an important skill for healthcare professionals in Neonatal Intensive Care Units (NICU) and delivery rooms. Ensuring proficiency and sustainability in these skills are vital for improving neonatal outcomes. This audit evaluates the initial knowledge and skills of neonatal resuscitation among doctors, nurses, and midwives in UVA Province, Sri Lanka, and assesses improvements following the Neonatal Life Support (NLS) program.

Methods:

The study had 118 participants including 38 doctors, 40 nurses, 20 hospital midwives, and 20 field midwives. Baseline knowledge and skills were assessed using a standardized written test and practical skills evaluation. Following the assessment, all participants underwent the NLS program, which comprised of both theoretical and hands-on training. A post-program assessment was conducted using the same evaluation tools. Data were collected from multiple NLS programs held over a period of four months from February 2024 till May 2024.

Results:

Initial assessment revealed that 18 out of 38 doctors (47.3%), 8 out of 40 nurses (20%), 8 out of 20 hospital midwives (40%), 4 out of

20 field midwives (20%) met the required standard, resulting in an overall competency of 38 out of 118 (32%).

After the NLS program, results showed that 38 out of 38 doctors (100%), 36 out of 40 nurses (90%), 18 out of 20 hospital midwives (90%) and 16 out of 20 field midwives (80%) met the standard. Overall competency increased to 94 out of 118 (91.5%).

Discussion:

The initial assessment revealed significant gaps in neonatal resuscitation and skills among healthcare professionals. The NLS program resulted in substantial improvements across all groups, demonstrating the effectiveness of such structured training programs. Enhanced competencies in neonatal resuscitation are likely to improve clinical outcomes for neonates requiring resuscitation.

Conclusion:

This audit underscores the importance of regular and structured training programs like the NLS in improving neonatal resuscitation skills among healthcare professionals. The significant improvements observed post-NLS program highlight the need for ongoing education and training to maintain high standards of neonatal care.

OUTCOMES OF PRETERM BABIES, BORN IN A TERTIARY CARE NEONATAL TRAINING CENTRE, IN COLOMBO SRI LANKA, AT THE TIME OF DISCHARGE FROM HOSPITAL FOR 2023/2024

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Introduction:

Prematurity accounts for over half of neonatal deaths in Sri Lanka. However, data regarding preterm outcomes are sparse.

Objective:

To determine the outcomes of preterm babies in a tertiary care neonatal center in Colombo Sri Lanka

Method:

A retrospective study was conducted at University Unit, De Soysa Hospital for Women, Colombo on the outcome of preterm babies discharged from 01.01.2023 to 30.06.2024. Permission was obtained from the head of the institution. All preterm babies born before 37 weeks of gestation were included. Deaths and transfers out were excluded. Data on discharge outcomes were obtained from discharge summaries. Cross checking this data with births, admissions, discharge and death registers ensured that no records were missed during data collection. Microsoft Excel for Mac v16.7.1 was used for statistical analysis.

Results:

There were 4485 live births with 394 (8.8%) preterm births; 307 (76%), were moderate-to-late (MLP) (32-37 weeks), 71 (18%) very-preterm (VP) (28-31 weeks) and 26 (6%)

were extreme preterm (EP) (<28 weeks). Neonatal unit admission was seen in 39%, 82% and 100%, while mortality was 1%, 7% and 38% for MLP, VP and EP. Mean and SD for age at discharge, birth weight and discharge weight were 16 ± 22 days, 2.1 ± 0.5 kg, 2.0 ± 0.4 kg for MLP, 39 ± 24 days, 1.3 ± 0.3 kg, 1.6 ± 0.2 kg for VP and 90 ± 25 days, 0.9 ± 0.2 kg, 2 ± 0.7 kg for EP. Respiratory support was required in 54%, 31% and 100% in MLP, VP and EP. CPAP was used in 52%, 92% and 100%, whereas NIMV was used in 13%, 6% and 100% and invasive ventilation in 4.5%, 39% and 100% in MLP, VP and EP. Expressed breast milk was started on day one for 93%, 75% and 50%, on day 2 for 6%, 19%, 50% for MLP, VP and EP. Parenteral nutrition was used in 19%, 6% and 100% in MLP, VP and EP. Retinopathy (ROP) wasn't seen in MLP, but 36% and 50% in VP and EP. Biochemical osteopenia wasn't seen in MLP but, 72% and 100% in VP and EP. Blood transfusions were used in 8%, 28% and 83% in MLP, VP and EP.

Conclusion:

Most preterm births were MLP with 99% survival and minimal complications. VP and EP had 93% and 6% survival, with higher rates of complications.

INDUCTION OF LABOUR WITH FOLEY CATHETER INSERTION- THE EFFECT OF “UNFAVORABLE CERVIX” AND ASSOCIATED FACTORS

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Introduction:

When a woman doesn't start her labor as having an unfavorable cervix at accepted dates or if the delivery of the baby will bring a better outcome than extending the pregnancy at a relevant period of amenorrhea, induction of labor plays a major role in starting her labor. The unfavorable cervix is defined as a cervix less than 8 of the bishop score.

The Foley catheter is a safe, effective, and feasible mechanical method of induction of labor (IOL). By Foley induction expected result was a successful vaginal delivery than directly going to elective C-section.

Objectives:

Study the outcome of IOL with Foley catheter of an unfavorable cervix at past dates and the association of the factors to the outcome (Mother's BMI, Estimated weight of the baby, Parity, bishop's score at the induction)

Design:

A descriptive cohort study was designed at the Professorial Unit of the De Soysa Maternity Hospital, Colombo.

Method:

All the women who had induction of labor using a Foley catheter due to unfavorable cervix at 40+6 weeks were selected and all

the associated factors mentioned above were noted for 6 months period.

Results:

A total of 177 women had labor induction for unfavorable cervix, out of which, 55(31.04%) terminated the pregnancy with emergency cesarean sections. Major indications were fetal distress and Lack of progression, 103(58.1%) and 19(10.7%) unassisted vaginal deliveries and assisted vaginal deliveries respectively. Most of the mothers (71/103; 68.9%) who delivered by unassisted vaginal delivery were mothers with a parity of 3 or more.

There were 33(42.8%) of BMI more than 30 kgm-3 postdates mothers, 31(93.9%) undergo Emergency C-section. Mothers who had baby of EFW more than 3.2kg with past dates were 48(8.3%). Out of which 33(68.75%) undergo emergency caesarian section. Mothers who had a bishop score of 6 or more at the induction (39), 92% (36/39) delivered via unassisted vaginal delivery.

Conclusions:

There is no statistical significance between the outcome and parity, BMI, estimated fetal weight of the baby, and the bishop score at induction. Hence, using the bishop's score to decide the favorability of the cervix should be studied more.

MANAGEMENT OF PREGNANCY COMPLICATED BY RED CELL ISOIMMUNIZATION WITH KELL ANTIBODIES

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Introduction:

The incidence of anti-Kell alloimmunization of pregnancy is quoted to be around 1.16 per 1000 pregnancies and may cause stillbirth or severe anaemia of neonate at birth.(1) As anti-Kell antibodies inhibit growth of Kell positive erythroid progenitor cells fetal anaemia may not correlate well with antibody titers. (2)

Objective:

Describe a pregnancy complicated with red cell isoimmunization with Kell antibodies

Method and Result:

A 38-year-old woman in her 6th pregnancy with no living children was referred at a period of gestation of 20 weeks with diagnosis of red cell isoimmunization with unexpected antibodies positive against Kell antigen. The patient had a first trimester miscarriage followed by two intra-uterine fetal deaths (IUFD) initially. In her 4th pregnancy caesarean delivery was carried out at 32 weeks of gestation due to hydrops fetalis and neonate died postnatally due to severe anaemia. Subsequent investigations revealed positive Kell antibodies in this B positive, Kell negative woman. Her fifth pregnancy miscarried at 20th week of gestation without an evident cause.

In her 6th pregnancy she was referred for fetal medicine opinion at 20th week of

gestation. Though non-invasive fetal K status testing was offered to stratify risk as her partner was having B positive blood group with heterozygous status for K antigen it was not affordable. (3) She was monitored with weekly middle cerebral artery peak systolic velocity assessment (MCA PSV) and had an intrauterine transfusion at 25 weeks of gestation. Later the baby was delivered at 28 weeks of gestation via a hysterotomy with a birth weight of 1.025 kg as MCA PSV above 1.5 times of multiples of median. Neonate had a haemoglobin level of 5.5 g/dl at birth. Subsequently baby had six blood transfusions and was treated with intravenous immunoglobulin (IVIG) which are standard management options for neonate.(4) However neonate's serum bilirubin was below the threshold for phototherapy or exchange transfusion throughout.

Conclusion:

Management of pregnancies affected with red cell isoimmunization in a tertiary care center with multi-disciplinary management with involvement of fetal medicine specialist, neonatologist and transfusion physicians will improve pregnancy outcome.

References

1. MAYNE KM, BOWELL PJ, PRATT GA. The significance of anti-Kell sensitization in pregnancy. Clin Lab Haematol. 1990;
2. Vaughan JI, Manning M, Warwick RM, Letsky EA, Murray NA, Roberts IAG. Inhibition of Erythroid Progenitor Cells by Anti-Kell Antibodies in Fetal Alloimmune Anemia. N Engl J Med. 1998;
3. Rieneck K, Clausen FB, Bergholt T, Nøgaard LN, Dziegiel MH. Non-Invasive Fetal K Status Prediction: 7 Years of Experience. Transfus Med Hemotherapy. 2022;
4. YÜCEL H, ÇELİK İH, KAVURT AS, ÖZCAN B, SANDAL S, BAŞ AY, et al. A Neonate with Severe Hemolytic Disease Treated With Repeated Doses of Intravenous Immunoglobulin and Erythrocyte Transfusion Due to Anti-E, C and Kell Isoimmunization. Türk Kadın Sağlığı ve Neonatoloji Derg. 2022;

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