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Audit of Golden Hour Practice in Neonate Assiut University Children Hospital

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Abstract

Background: A golden-hour strategy is a philosophical approach that reinforces communication and collaboration (inter-and intra-team) using evidence-based protocols and procedures that standardize as many elements as possible for delivery and initial management of a newborn. Golden-hour strategies lay out how the neonatal team will receive notification from the obstetrical service of an impending periviable birth and stress the importance of collaborative counseling of the family.

The Vermont Oxford Network (VON), a worldwide non-profit collaborative of neonatal healthcare providers, began to use "golden hour" to describe the first hour of life for the Very Low Birth Weight (VLBW) infant in the late 1990s.

Pre-resuscitation check lists are used for briefing the care team to the equipment that they will need to prepare both in the delivery room and Neonatal Intensive Care Unit (NICU) in the form of standardized check lists. Personnel have clearly assigned roles and responsibilities. This promotes training and adherence to the American Academy of Pediatrics/ American Heart Association Neonatal Resuscitation Program (NRP) algorithm.

Aim of Study: The aim of the study is to assess the degree of adherence of medical physician to Assiut University Children Hospital protocol for application of golden hour practice in neonate. Also to review potentially better practice that can be applied during the golden hour to ensure the optimal outcome.

Patients and Methods: The study included 100 cases that were delivered at Assiut University Maternal Health Hospital and followed-up during the first hour of life. The included cases were chosen according to the inclusion criteria and the data was collected during the period between October 2016 to March 2017.

Results: The study included 100 newborn infants their gestational ages ranged from >29 weeks to <40 weeks, 51 cases were males and 49 were females. Data of the study showed how much the degree of adherence of medical physician to the agreed up on protocol of golden hour practice in Assiut University Children Hospital.

Conclusion: This study provides valuable insight to assess the degree of adherence of medical physician to Assiut Children Hospital protocol for application and effectiveness of golden hour practice in neonate. Also to review potentially better practice that can be applied to ensure the optimal outcome using a statistically powerful calculated sample size and powerful data.

Key Words: *Golden hour – Resuscitation – Neonatal resuscitation program – Neonatal Intensive Care Unit.*

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Introduction

THE golden-hour practices focus on minimizing stress in infants at birth and during the first hour of life that represents a time period during which the infant faces challenges that carry risks of short and long term injury, lifelong developmental delay, and even death **[1-4]**.

Delivery room personnel have the opportunity to impact the transitional process, positively or negatively. During this time period, the clinician is faced with complex decisions based on multiple systems that require attention Neonatologists and neonatal nurse practitioner are the lead providers of delivery room stabilization in the hospital **[5]**.

Neonatal resuscitation requires careful surveillance, timely identification of complications, and timely and appropriate interventions. Appropriate teamwork and interventions have been shown to be lacking in delivery room resuscitation, and individual provider performance can influence the neonatal delivery room process **[6]**.

Improving team performance and providing consistent caregiving practices have been identified as fundamental principles to improve neonatal outcomes through the reduction of errors and improvement in patient safety **[7]**.

Approaches to minimize that risk include the neonatal resuscitation program developed by the American Academy of Pediatrics and the American Heart Association [8].

Subjects and Methods

A total number of 100 patients were delivered at Assiut University Maternal Hospital that chosen according to inclusion criteria and the data of the 100 cases were collected during the period between October 2016 to March 2017.

Study site:

Neonatal Intensive Care Unit at Assiut University Children Hospital, tertiary-care center.

Inclusion criteria:

- Gestational age >29: <40 weeks.
- Delivered at Assiut Maternal Hospital.
- First hour of life.

Data collection:

Observing and reviewing sheets of newborns delivered at Assiut University Maternal Hospital during the study duration.

The following data were collected and recorded for each patient in a master sheet for golden hour practice:

- Demographic data: Name, gestational age, and sex.
- History: Mode of delivery, date of birth, time of birth.
- Risk factors: Antepartum and intrapartum, maternal and fetal.
- Delivery room preparation checked before delivery such as: Attending personnel, suction equipment, bag and mask, intubation equipment, radiant warmer, pulse oximeter, umbilical venous catheter, medication for resuscitation and surfactant.
- Initial assessment of newborn immediately after birth: Gestational age, breathing or crying, amniotic fluid and muscle tone.
- Application of NRP algorithm: Such as respiratory assessment and circulatory assessment and total duration of resuscitation.
- Routine care at delivery room: Warmth, positioning, cleaning of air ways, stimulation of respiration, delayed cord clamping, vitamin K, identify band and measurement of birth weight.
- Precaution for sepsis: Such as hand washing, gloves and mask, sterile towels.
- Prevention of hypothermia: Such as removal of wet towels, skin to skin contact, adequate room temperature and prewarmed blanket.
- NICU admission, discharge and transfer: Time of admission, time of discharge and duration of referral.
- NICU interventions and investigations.
- Quick physical examination, family communication and initiation of breast feeding.

Statistical analysis:

The data were entered and analyzed using statistics computer program SPSS.

Results

Demographic data enrolled 51 cases were males and 49 were females, 78% were delivered by cesarean section and 22% were normal vaginal deliverey, their gestational age ranged from >29 weeks to <40 weeks GA, 56% were >37:<40wk, 35% were 33:37wk and 9% were >29:<33wk.

All patients (100%) were observed at the delivery room before birth till stabilization and discharge or NICU admission. A detailed history was obtained for antepartum, intrapartum, maternal and fetal risk factors before delivery (Tables 1,2).

Table (1): Maternal risk factors (antepartum, intrapartum).

Antepartum risk factors			Intrapartum risk factors		
	Recorded	Not recorded		Recorded	Not recorded
Total	80%	20%	• Total	78%	22%
Gestational DM	10%	15%	• General anesthesia	3.8%	9%
Pre-eclampsia	22.5%	20%			
Placenta previa	10%	5%	• Placental abruption	5.1%	27.3%
Drug intake	1.2%	5%			
Previous CS	48.7%	0	• Narcotics	1.2%	0
NO risk	7.5%	30%	• No risk	89.7%	9%

Table (2): Fetal risk factors (antepartum, intrapartum).

Antepartum risk factors			Intrapartum risk factors		
	Re-corded	Not recorded		Re-corded	Not recorded
Total	82%	18%	Total	88%	12%
PROM	24%	5.5%	Breech	31.8%	33.3%
Polyhydramnios	8.5%	27.7%	Preterm	30.7%	16.7%
Oligohydramnios	6%	27.7%	Meconium	17%	41.7%
Multiple pregnancy	12.1%	22.2%	Macrosomia	3.7%	8.3%
Malformation	3.7%	11.1%	No risk	17%	0
Cord prolapse	1.2%	5.5%			
No risk	43.9%	5.5%			

DM : Diabetes Mellitus.
CS : Cesarean Section.
PROM : Premature Rupture of Membranes.

In the delivery room: All cases were observed for checking the delivery room preparations for their presence and being functioning before delivery, initial assessment immediately after delivery, precautions for sepsis, preventive measures of hypothermia, full routine care of a newborn, delayed cord clamping for 30-60sec after birth, family communication and initiation of breast feeding shortly after birth (Table 3).

Table (3): Delivery room assessment.

• Checking delivery room preparations	68%	• Initial assessment of a newborn	62%
• Precautions of sepsis	85%	• Preventive measures of hypothermia	84%
• Routine care for a newborn	93%	• Delayed cord clamping	14%
• Family communication	54%	• Initiation of breast feeding	13%

According to NRP, a meticulous follow-up should be done for all case to maintain respiratory assistance and circulatory assistance Figs. (1,2).

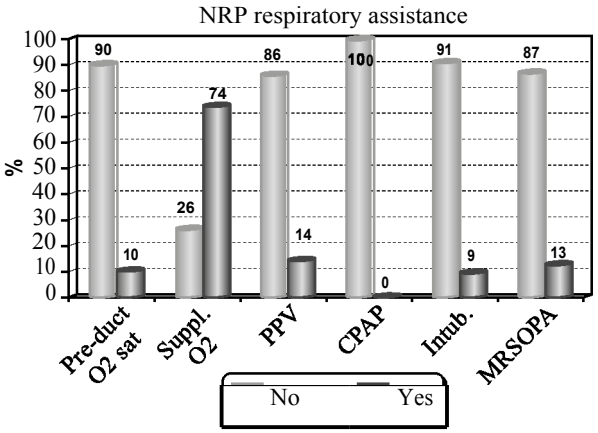

Fig. (1): NRP respiratory assistance.

PPV : Positive Pressure Ventilation.
CPAP : Continuous Positive Airway Pressure.
MRSOPA : Musk adjustment, Repositioning, Suction, Open mouth, Pressure, Airway alternative.

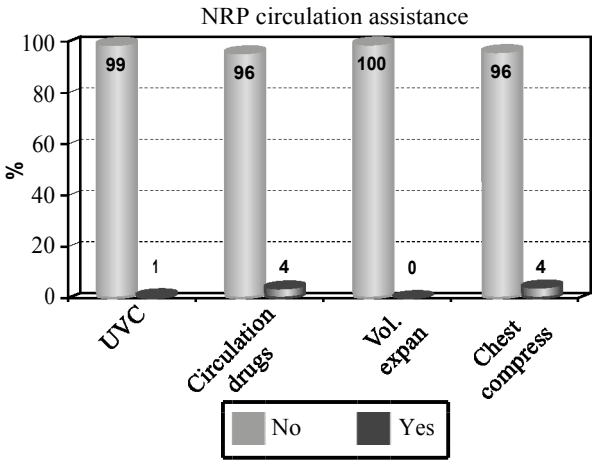

Fig. (2): NRP circulation assistance.

Neonatal Intensive Care Unit management:

Interventions and investigations that were done in NICU in Assiut University Children Hospital Figs. (3,4).

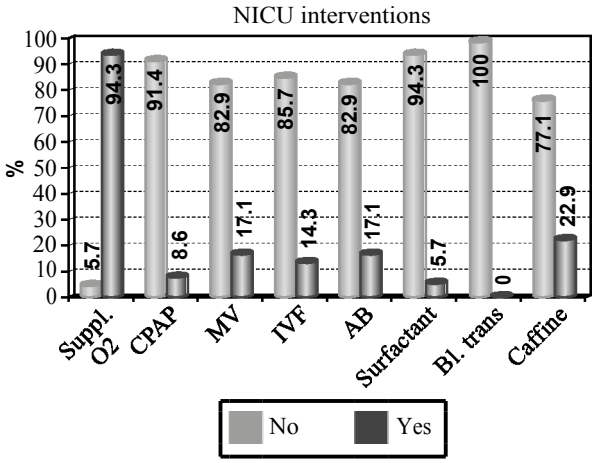

Fig. (3): NICU interventions.

MV: Mechanical Ventilation. AB : Antibiotics.
IVF: Intravenous Fluids. Bl.Trans : Blood Transfusion.

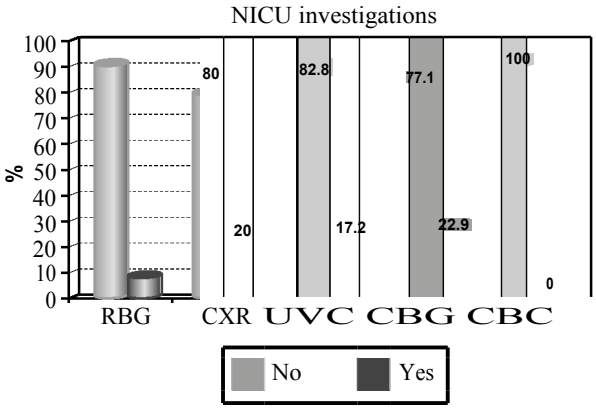

Fig. (4): NICU investigations.

RBG: Random Blood Glucose.
CXR: Chest X-Ray. CBG: Capillary Blood Gases.
UVC: Umbilical Venous Catheter. CBC: Complete Blood Count.

Table (4): Neonatal Intensive Care Unit management.

• NICU admission	35%	• Time of NICU transfer	<20min	>20min
• Quick physical examination	57%		8.5%	91.5%
• Initiation of breast feeding	13%	• Family communication	54%	
		• Time of discharge	<1hr	>1hr
			6.2	93.8

Discussion

Our study highlights some very important points. The entire cases (100%) were observed according to golden hour protocol during first hour of life.

Data of the study showed how much the degree of adherence of medical physician to the agreed upon protocol of golden hour practice in Assiut University Children Hospital that based on American academy of pediatrics and American heart association.

Our aim was in observing and reviewing patient sheets of golden hour practice to assess how much the adapted protocol was applied.

A detailed history and physical examination was done to all cases and most common defect was in history of maternal illness and fetal risk factors. Also there was a defect in application of essential points in neonatal resuscitation program and the referral system.

Being prepared is the first and most important step in delivering effective neonatal resuscitation [1]. Neonates requiring resuscitation are inevitably born in locations where resuscitation is uncommon because most newborns are healthy and do not require additional special assistance. In these settings, the need for resuscitation is not anticipated in most infants who require resuscitation [9]. As a or not problems are anticipated [1].

Result, at every birthing location, personnel who are adequately trained in neonatal resuscitation should be readily available to perform neonatal resuscitation whether.

Neonatal resuscitation program:

With the advances in neonatal care, the number of preterm infants and critically ill term infants who survive and are discharged from the Neonatal Intensive Care Unit (NICU) continues to increase [10].

The American Academy of Pediatrics (AAP) has developed guidelines for the primary care provider in the management of the high risk infant. These guidelines highlight the shared responsibility of the care of the infant between the primary care provider and the neonatologist, the need for effective communication with the family, the importance of continuity of care at the time of discharge from the NICU [11].

Once delivery resuscitation is completed and the infant is transported to the NICU, care practices to prevent complications must continue. Artificial surfactant is typically administered within the first hour of life to improve lung expansion and prevent chronic lung disease if the infant is ventilated [12].

The infant will be placed in an incubator as soon as possible and the environment is humidified to assist in temperature regulation, fluid and electrolyte balance and skin maturation [12]. For prevention of chronic lung disease, IVH and ROP, oxygen is titrated to avoid high saturation and the ventilator is weaned based on blood gas findings to avoid hypocapnia or hypercapnia. Only necessary interventions are completed, assessments are infrequent for the first 72 hours, and tracheal suctioning only is done as needed in an effort to reduce risk of IVH.

Intravenous fluids should be administered within the first 30 minutes of life to avoid hypoglycemia, and amino acids are added to infusions within two hours of life to support nutrition needs and the premature infant's protein deficit [12,13]. Intravenous access is important during the golden hour to supply the neonate with important fluids, electrolytes and nutrients. For the VLBW infant, a glucose infusion should be initiated within 30 minutes post-birth and should be infused at 4-7mg/kg/min to meet the infant's basal metabolic needs [14].

Conclusion:

The golden-hour practices focus on minimizing stress in infants at birth and during the first hour of life [4]. It represents a time period during which the infant faces challenges that carry risks of short and long term injury, lifelong developmental delay, and even death.

Delivery room personnel have the opportunity to impact the transitional process, positively or negatively. During this time period, the clinician is faced with complex decisions based on multiple systems that require attention [5].

Appropriate teamwork and interventions have been shown to be lacking in delivery room resuscitation, and individual provider performance can influence the neonatal delivery room process [6]. Improving team performance and providing consistent caregiving practices have been identified as fundamental principles to improve neonatal outcomes through the reduction of errors and improvement in patient safety [7].

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Nil.

Recommendations:

Justification of data by the pediatrician attending delivery of a new born infant were not recorded in many cases due to lack in the recording system

and follow-up sheets so that an improvement in recording system will facilitate better documentation and results.

An intimate communication between the obstetrician and the pediatrician is essential for better practice. Ongoing risk assessment during prenatal, antepartum and intrapartum care that identify many cases of babies who will require special attention including resuscitation should be notified to the pediatrician before.

Pediatrician and the paramedical personnel must be well trained and skilled enough to take the responsibility of initiating neonatal resuscitation according to the agreed up on guidelines of our NICU and to be immediately available to deal with high risk infants.

We recommend the assurance of a viability and well functioning of all equipments and supplies needed at delivery room for complete asptic delivery such as: Pulse oximeter, suction and intubation equipments, and drugs.

For thermoregulation, early skin to skin contact is recommended at delivery room immediately after birth, also adequate room temperature should be maintained at 25-26c to avoid heat loss especially in a preterm infants. Place the premature neonates in polyethylene bags or occlusive wrapping rather than dry them at delivery room.

According to the AAP and ACOG recommendation to adopt the policy of early initiation and maintenance of breast feeding shortly after delivery.

According to the AAP and AHA guidelines, on NICU admission, rapid management and dealing with the infant at risk such as: Surfactant administration, N-CPAP, IV fluids, antibiotics, chest X-ray, blood glucose level, blood gases should be done without delay.

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دراسة تدقيقية عن ممارسة الساعة الذهبية للأطفال حديثى الولادة فى مستشفى الآطفال الجامعى بآسيوط

تقييم مدى إلتزام الآطباء بالبروتوكول العلاجى للآطفال حديثى الولادة فى الساعة الأولى من الحياة والذين تم ولادتهم فى مستشفى صحة المرآة الجامعى بآسيوط خلال الفترة من آول سبتمبر ٢٠١٦ وحتى مارس ٢٠١٧.

تتضمن الرسالة ١٠٠ طفل حديثى الولادة، عدد الذكور ٥١ حالة وعدد الإناث ٤٩ حالة، يتروا ح عمرهم الرحمى من آكثر من ٢٩ إسبوع إلى آقل من ٤٠ إسبوع. وآظهرت بيانات الدراسة مدى إلتزام الآطباء بممارسة المبادئ التوجيهية للساعة الذهبية للآطفال حديثى الولادة فى وحدة رعاية حديثى الولادة بمستشفى الآطفال الجامعى بآسيوط.

- التواصل المستمر بين آطباء التوليد وطبيب الآطفال وتبليغه بكافة البيانات اللازمة للإستعداد الآمثل لإستقبال الطفل حديثى الولادة.
- التدريب المستمر للآطباء والمساعدين بالمبادئ التوجهية للساعة الذهبية للآطفال حديثى الولادة وتقديم الرعاية الآفضل.
- التآكد من وجود وفاعلية الآدوات اللازمة للإستخدام فى غرفة الولادة.
- تقديم آفضل الطرق والوسائل لنقل الآطفال حديثى الولادة التى تحتاج للدخول إلى حضان.
- التشجيع على بدء الرضاعة المبكرة للآهل وتقديم المساعدة اللازمة لذلك للآم.
- التواصل الوثيق بين طبيب الآطفال والآهل وإبلاغهم بكافة البيانات اللازمة سواء كان الطفل فى حالة جيدة آو بدء الإنعاش القلبى الوئوى للطفل وسوء حالته الصحية.