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NEONATAL INTENSIVE CARE UNIT & INDICATIONS FOR ADMISSION WITH THEIR RELATION TO GENDER & MODE OF DELIVERY

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SUMMARY

A study done in Jalawla general hospital in Neonatal Intensive Care Unit which consist of three incubators, where 90 patients in five months included in the study, Gestational age of these patients where between(26_41)weeks. Sixty-one of these neonates where male & 29 where female. Forty-two of these patients delivered by N.V.D(normal vaginal delivery) & 48 delivered by C/S(Caesarian Section).

The study show that 21.1% admitted for R.D.S(Respiratory Distress Syndrome), 18.8% admitted for birth asphyxia, 15.5% of patients admitted for T.T.N (Transient Tachypnea Of Newborn), 17.7% admitted for jaundice, 11.1% admitted for Vomiting, 6.6% admitted for congenital anomaly, 5.5% admitted for hypoglycemia, 2.2% with Meconium aspiration pneumonia, 1.1% with congenital pneumonia.

The study show that the weight of 6.6% of patient was between 0.5-1.4kg, 42.2% was between 1.5-2.9 kg, 51.1% between 3-4.5kg, which mean that body weight increase with gestational age. Also study show that indication of C/S increase with high gestational body weight.

AIM OF STUDY

This study was done to explain N.I.C.U & see most common cases admitted to N.I.C.U, resuscitation & its relation to gender (male & female) & mode of delivery.

INTRODUCTION

A neonatal intensive care unit (NICU), also known as an intensive care nursery (ICN), is an intensive care unit specializing in the care of ill or premature newborn. Infant. Neonatal refers

to the first 28 days of life.”2”. The term neonatal comes from neo, "new", and natal, "pertaining to birth or origin". Neonatal nurse practitioners are advanced practice nurses that care for premature babies and sick newborns in intensive care units, emergency rooms, delivery rooms, and special clinics. Prematurity is a risk factor that follows early labor, a planned caesarean section, or pre-eclampsia.”3”. Neonatal care, as known as specialized nurseries or intensive care, has been around since the 1960s.”3”. The first American newborn intensive care unit, designed by Louis Gluck, was opened in October 1960 at Yale–New Haven Hospital.”3”. NICU is typically directed by one or more neonatologists and staffed by nurses, nurse practitioners, pharmacists, physician assistants, resident physicians, respiratory therapists, and dietitians.”3”. Many other ancillary disciplines and specialists are available at larger units.”3”.

History

The problem of premature and congenitally ill infants is not a new one.”3”. As early as the 17th and 18th centuries, there were scholarly papers published that attempted to share knowledge of interventions.”3”. It was not until 1922, however, that hospitals started grouping the newborn infants into one area, now called the neonatal intensive care unit (NICU).”3”. Before the industrial revolution, premature and ill infants were born and cared for at home and either lived or died without medical intervention”3". In the mid-nineteenth century, the infant incubator was first developed, based on the incubators used for chicken eggs.”3”. Dr. Stephan Tarnier is generally considered to be the father of the incubator (or isolette as it is now known), having developed it to attempt to keep premature infants in a Paris maternity ward warm. Other methods had been used before, but this was the first closed model; in addition, he helped convince other physicians that the treatment helped premature infants. “3”. France became a forerunner in assisting premature infants, in part due to its concerns about a falling birth rate. “3”. Dr A. Robert Bauer MD at Henry Ford Hospital in Detroit, MI, successfully combined oxygen, heat, humidity, ease of accessibility, and ease of nursing care in 1931.”3”. The development of pulmonary surfactant, which facilitates the oxygenation and ventilation of underdeveloped lungs, has been the most important development in neonatology to date. “3”. Not only careful nursing but also new techniques and instruments now played a major role.”3”. These needed special modification for small babies, whose bodies were tiny and often immature.”3”. Adult ventilators, for example, could damage babies' lungs and gentler techniques with smaller pressure changes were devised.”3”. Some hospitals admitted all babies delivered by caesarian section or under 2500 g in

weight.”3”. The fact that these babies missed early close contact with their mothers was a growing concern. “3”.

Nursing & Neonatal Population

Healthcare institutions have varying entry-level requirements for neonatal nurses. Neonatal nurses are registered nurses (RNs), and therefore must have an Associate of Science in Nursing (ASN) or Bachelor of Science in Nursing (BSN) degree Some countries or institutions may also require a midwifery qualification. Some institutions may accept newly graduated RNs having passed the NCLEX exam; others may require additional experience working in adult-health or medical/surgical nursing.”3”. Some countries offer postgraduate degrees in neonatal nursing, such as the Master of Science in Nursing (MSN) and various doctorates.”3”.

Patient populations“3

1. Anemia 2. Apnea 3. Bradycardia 4. Bronchopulmonary dysplasia (BPD) 5. Hydrocephalus 6. Intraventricular hemorrhage (IVH). 7. Jaundice 8. Necrotizing enterocolitis (NEC). 9. Patent ductus arteriosus (PDA). 10. Periventricular leukomalacia (PVL). 11. Infant respiratory distress syndrome(RDS). 12. Retinopathy of prematurity (ROP) Neonatal sepsis. 13. Transient tachypnea of the newborn (TTN).

Normal vital signs in the Newborn”15"

< 3kg (premature)	>3kg (full term)
1.HR(Beats/min): >100(100-180)	1.HR: >100(100-180)
2.R.R(Breaths/min): 40-80	2.R.R: 40-80
3.Systolic Bp(mmHg,mean):40-60(35-45)	3.Systolic Bp: 60-70(45-55)

Levels of care”3”

1. India Level I care Level II care Level III care 2. United Kingdom Level 1 Neonatal Units Level 2 Neonatal Units Level 3 Neonatal Units 3. United States Level I (well newborn nursery) Level II (special care nursery) Level III (neonatal intensive-care unit) Level IV (regional NICU).

What does all the equipment in the baby unit do?”5"

(1) Incubator

A see-through box on wheels which keeps your baby warm. It may be open, with an overhead heater or heated mattress, or closed, with a lid, to keep the air around your baby warm and humid.

(2) Overhead heater

A heater for an open incubator to make sure your baby's temperature is correct.

(3) Monitors

These check your baby's breathing rate, heart rate, blood pressure, temperature, and the amount of oxygen, carbon dioxide and acidity in his blood They also alert staff if your baby has apnea, in which the baby stops breathing for more than 10-20 seconds. This is quite common in premature babies.

(4) Ambient oxygen analyzer

This small appliance sits inside the incubator to make sure there is enough oxygen in the air.

(5) Intravenous (IV) drip

Your baby can receive fluids, nutrients and medication through this narrow tube and needle. If your baby needs a drip for a long time, the team might insert a catheter (also called a PICC line or long line), which doesn't need to be changed so often.

(6) Feeding pump and tubes

Flexible plastic tubes through which nutrients are passed. They might have one, or all, of the following: a nasogastric tube which goes through your baby's nose, an orogastic tube through their mouth and into their stomach, and a transpyloric tube which goes directly to their gut.

(7) Power supply

The point from where the power comes to power the other machines. All hospitals have back-up power in case of a power cut.

(8) Ventilator monitor

A monitor on which all the ventilator settings are displayed.

(9) Ventilator

Some babies will be put on a ventilator - a machine that blows air and oxygen through a tube into their nose or throat and into the lungs. A positive pressure ventilator delivers the air mixture in 'breaths' while an oscillatory or high-frequency ventilator delivers it through tiny vibrations.

Principles

Preparation for neonatal resuscitation requires an understanding of how it differs from pediatric and adult resuscitation, primarily as follows: 1. Newborns have rapidly changing, dynamic cardiopulmonary physiology, with a unique range of normal vital signs.”2”. 2. Neonatal resuscitation is almost entirely respiratory (not cardiac) management. 3. Neonates require special and dedicated equipment.”2”.

Pathophysiology

Transition From Fetal to Extra uterine Life

The successful transition from fetal to extra uterine life requires three major cardio-respiratory changes: (1) removal of fluid from unexpanded alveoli to allow ventilation; (2) lung expansion and establishment of functional residual capacity; and (3) redistribution of cardiac output to provide lung perfusion.”2”. Failed development of adequate ventilation or perfusion leads to persistent shunting, hypoxia.”2”.

Indications for Resuscitation

At least one person, whose exclusive role is to ensure safe transition of the newborn, should be present for all deliveries, including those that occur outside the delivery room. Any infant born outside of a delivery room should be anticipated to need resuscitation. Although minimal intervention may be required, a standardized approach should still be followed. Some specific conditions increase the likelihood that additional resuscitative efforts will be required.”2”.

1. Hypoxia

Even in the uncompromised newborn, it can take 10 minutes for blood oxygen saturation to reach normal extrauterine levels.”2”. Pulse oximetry may assist in determining hypoxemia, but it may take several minutes for a reliable waveform to be achieved. “2”. In utero or intrapartum asphyxia (pathologic lack of oxygen to the fetus before or during delivery) can precipitate a sequence of events that results in primary or secondary apnea.”2”.

With initial hypoxia, rapid gasps are followed by cessation of respirations (primary apnea) and, if prolonged, decreased heart rate (HR).”2”. Ostensibly normal respiratory effort does not ensure adequate ventilation. “2” However, bradycardia in the newborn (HR < 100 beats/min) almost always reflects inadequate ventilation and oxygenation. “2”. As such, bradycardia is a major indicator of hypoxia.”2”. Simple stimulation is required at the onset of primary apnea to stimulate ventilation and reverse bradycardia.”2”.

If asphyxia persists, the newborn takes several final deep, gasping breaths, followed by cessation of respirations (secondary apnea); this is accompanied by worsening bradycardia, refractory to simple stimulation, and eventually hypotension.”2”. For newborns with secondary apnea, more vigorous and prolonged resuscitation is needed to restore ventilation and adequate circulation.”2”.

2. Hypothermia

Drying and warming the newborn are vital to initial resuscitation because the newborn’s inability to maintain normothermia (>36.5°C [97.7°F]) has potentially dire consequences.”2”. Newborns cannot generate heat by shivering, cannot retain heat due to low fat stores, and have excess heat loss due to their large surface to-volume ratio. “2”. Exacerbating these challenges in the immediate postpartum period, newborns have an acutely elevated metabolic rate, are covered with amniotic fluid, and are suddenly exposed to a relatively cool environment. “2”. Body temperature rapidly decreases, with hypothermia accelerating metabolic acidosis, oxygen consumption, hypoglycemia, and apnea.”2”. Prematurity and very low-birth-weight status exacerbate these consequences and require extra efforts to mitigate.”2”.

3. Hypoglycemia

Poor glycogen stores, coupled with immature hepatic enzymes, place the normal newborn at increased risk for hypoglycemia.”2”. Hypoglycemia is particularly common in premature and small for-gestational-age newborns, as well as those born to diabetic mothers.” 2”. Hypoglycemia may also be a response to other factors, including respiratory illness, hypothermia, polycythemia, asphyxia, and sepsis.”2”.

Hypoglycemia can be asymptomatic or may cause an array of symptoms, including apnea, color changes, respiratory distress, lethargy, jitteriness, seizures, acidosis, and poor myocardial contractility.”2”. A low blood glucose level, particularly when prolonged,

recurrent, or associated with hyperinsulism, has been associated with adverse neurologic outcomes; correction of hypoglycemia, if detected expeditiously, improves outcomes.”2”. Neonatal hypoglycemia is generally defined as a blood glucose level less than 40 mg/dl, although this number serves as more of a guideline than a strict cutoff.”2”. All newborns exhibiting signs of hypoglycemia, with glucose levels less than 40 mg/dl, should receive intravenous (IV) glucose. “2”. Of note, bedside glucometers generally underestimate plasma glucose levels by approximately 10 mg/dl.”2”.

4. Hypovolemia

Clinically significant hypovolemia is rare and usually secondary to blood loss. Risk factors include known maternal hemorrhage during delivery, prematurity, newborns with overt shock, and initiation of CPR.”2”. Hemorrhage can lead to respiratory depression and overt shock in the newborn, whether secondary to abruptio placenta, placenta previa, umbilical cord accident, or trauma.”2”. In the newborn, hemorrhage is one of the few situations in which fluid resuscitation and volume expansion needed.”2”.

5. Prematurity

Premature infants, especially those born before 34 weeks of gestational age, are uniquely at risk due to their pulmonary immaturity and susceptibility to hypothermia.”2”. Before approximately 32 weeks’ gestation, preterm newborns have a fragile network of capillaries in their brain that are prone to rupture and bleeding. Obstruction of venous drainage from the head or rapid changes in blood CO2 levels, blood pressure, or blood volume may increase the risk of rupturing these capillaries. Bleeding in the brain may cause tissue damage and lead to lifelong disability. Inadequate blood flow and oxygen delivery may cause damage to other areas of the brain even in the absence of hemorrhage, while excessive oxygen administration may cause damage to the developing retina, leading to visual loss.”13”.

Respiratory Disorders

Respiratory distress “4” 1. Respiratory; RDS, TTN, MAS(Others; Pneumonia, choanal atresia, Diaphragmatic hernia). 2. Nonrespiratory; Cardiac: cyanotic CHD, Heme; Anemia, polycythemia, 3. Others: Infectious, Metabolic, Neurologic.

6. Meconium-Stained Amniotic Fluid

Meconium-stained amniotic fluid (MSAF) indicates potentially significant newborn stress prior to delivery. Aspiration of meconium and its consequences can be avoided.”2”.

7. Special Anatomic Anomalies”2"

1. Diaphragmatic Hernia. 2. Myelomeningocele and Omphalocele 3. Choanal Atresia. 4. Pierre Robin Sequence. 5. Congenital Cardiac Disease.

8. Maternal Factors

1. Infection: Maternal infection (chorioamnionitis) is a particularly common trigger for premature delivery; premature infants are themselves more susceptible to infection.”2”. Therefore, IV antibiotics should be administered after obtaining blood cultures and a complete blood count should be carried out in all infants born before 37 weeks of. gestation.”2”. 2. Medications: Medications provided to the mother during labor or illicit drugs taken before delivery, usually opioids, can augment newborn respiratory depression.”2”. Maternal opioid administration or antenatal drug abuse should be considered in any newborn with isolated respiratory depression that persists, despite a seemingly successful initial resuscitation.”2”. As in adults, opioid-induced respiratory depression could be reversed with naloxone.”2”. However, naloxone may precipitate acute withdrawal and seizures in the newborn of an opioid-dependent mother; thus, naloxone is not recommended in the initial resuscitation of the newborn.”2”. Suspected opiate toxicity in the newborn should be treated with support of oxygenation and ventilation rather than pharmacological reversal.”2”. This should include use of a bag-mask device and, if necessary, intubation.”2”.

Equipment Checklist for Neonatal Resuscitation”2"

1. Gown, gloves, and eye protection (universal precautions). 2. Timing device. 3. Blankets (to warm and dry infant). 4. Plastic wrap (for omphalocele, gastroschisis, possibly premature infant). 5. Radiant warmer. 6. Bulb syringe. 7. Suction and suction catheters (sizes 5, 8, and 10 Fr) 8. Self-inflating (450 and 750 mL) and flow-inflating (250 and 450 mL) bags. 9. Masks (premature, newborn, and infant sizes), 10. Laryngoscope with straight blades (nos. 00, 0, and 1). 11. Endotracheal tubes with stylets (2.5, 3.0, 3.5, and 4 mm), uncuffed. 12. Scissors and tape to stabilize endotracheal tube. 13. Pediatric CO2 detector. 14. Meconium aspirator. 15. Umbilical catheters (3.5 and 5 Fr). 16. Hemostats, sterile drapes and gloves, povidone-iodine solution, scalpel, umbilical tape, suture, and three-way stopcock for umbilical vessel catheterization.

Criteria for Discharge from the Normal Newborn Nursery

1. Uncomplicated antepartum, intrapartum, postpartum courses Vaginal delivery Singleton at 38-42 wk: appropriate for gestational age Normal vital signs including respiratory rate less

than 60 breaths/min; axillary temperature 36.1-37°C (97.0-98.6°F) in open cribs. ”1”. 2. Physical examination reveals no abnormalities requiring continued hospitalization:. Urination; stool × 1. At least 2 uneventful, successful feedings. No excessive bleeding 2 hr after circumcision. No jaundice within 24 hr of birth; if jaundice, appropriate management and follow-up are in place.”1”. 3. Evidence of parental knowledge, ability, and confidence to care for the baby at home: Feeding Cord, skin, genital care Recognition of illness (jaundice, poor feeding, lethargy, fever, etc”1”. 4. Availability of family and physician support (physician follow-up). ”1”. 5. Laboratory evaluation: Syphilis Hepatitis B surface antigen and vaccination or appointment for vaccination, Coombs test and blood type if clinically indicated, Expanded metabolic screening: phenylketonuria, thyroid, galactosemia, sickle cell, Hearing screening. No social risks: Substance abuse, History of child abuse (Domestic violence, Mental illness, Teen mother, Homelessness) Barriers to follow-up. Source of continuing medical care is identified.”1”.

Maternal History Questions”2"

1. What is the estimated gestational age? 2. Is this a multiple gestation? 3. Is meconium present? 4. Is there a history of vaginal bleeding? 5. Were medications given or drugs taken? 6. Was there documented maternal fever? 7. Did mother have routine prenatal care? If so, were any abnormalities seen on prenatal ultrasonography?

Targeted preductal SpO2 after birth”2"

1 min 60-65%

2min 65-70%

3min 70-75%

4 min 75-80%

5 min 80-85%

10 min 85-95%

Apgar Score"4"

Sign	Points		
	0	1	2
Heart rate (beats/min)	Absent	Slow (<100)	=100>
Respirations	Absent	Slow, irregular	Good, crying
Muscle tone	Limp	Some flexion	Active, good flexion
Reflex irritability	No response	Grimace	Cough, sneeze
Color	Blue, pale	Pink body, blue hands and feet	Pink

What you need to know about the Apgar scoring system

1. Apgar scores are routinely assessed at 1 & 5 minutes & every 5 minutes thereafter as long as resuscitation is continuing."4". 2. The 1-minute score gives an idea of what was going on during labor & delivery."4". 3. The 5-minute score gives an idea of response to therapy(resuscitation)."4". 4. In general, the Apgar score is not predictive of outcome; however, infants with score 0-3 at 5 minutes & longer compared to infants with score 7-10 have a worse neurologic outcom."4".

Management

Dry, Warm, Position, Suction, Stimulate, and Assess Need for Further Intervention.

1. Hypothermia increases metabolic demand and oxygen consumption, which render effective resuscitation efforts futile. "2". To prevent these and subtle sequelae, all newborns should be dried immediately on delivery and placed under a radiant heat source."2". In the case of crying term infants with normal tone, this may be accomplished by simple drying and skin to skin contact with the mother. "2". Wet blankets should be replaced with dry blankets and preferably warm linens, but the baby should be left uncovered to facilitate radiant warming and team access, when required, all these done in place."2".

2. The supine neonate should be further positioned to maximize air entry and avoid obstruction of airflow."2". Due to a relatively large occiput and anterior glottic opening, airway patency is best achieved with the neck in a slightly extended position that aligns the posterior pharynx, larynx, and trachea is best accomplished by placing a rolled diaper or small towel under the infant's shoulders, not too large & not under neck because can lead to airway occlusion due to hyperextension of the neck."2" Only if meconium is present and the newborn has poor tone, poor respiratory effort, or bradycardia (HR < 100 beats/min) after 1

minute of appropriate PPV should the trachea be suctioned with an ETT and meconium aspirator attachment.”2”. Poor respiratory effort and obvious obstruction from secretions should otherwise be treated with bulb or mechanical suction (≈100 mm Hg wall suction).”2”. when suction is indicated, the mouth suctioned first, followed by the nose.”2”. This sequence helps avoid aspiration of oral secretions if the neonate inspires after nasal suctioning.”2”. Overly vigorous or deep suctioning should be avoided because it can cause significant vagal stimulation and subsequent bradycardia or apnea.”2”. For most term neonates, these measures stimulate breathing sufficiently and may be all that is required to resuscitate a newborn.”2”.

3. If adequate respirations are still not present, which is best done by flicking the soles of the feet and rubbing the back; more aggressive efforts could prove harmful.”2”.

4. Time is an important component of resuscitation, within the first 60 seconds of life newborn should be re assessed.”2”.

5. If stimulation and warming efforts prove inadequate, PPV is required, followed by intubation, if necessary.”2”. If the HR is below 100 beats/min, or if the newborn has primary apnea or respiratory distress, PPV and pulse oximetry should be initiated within the first minute of life.”2”. If bradycardia (HR < 60 beats/min) persists, despite adequate ventilation, chest compressions should be initiated.”2”. HR calculation can be manual—by palpation of the pulse at the base of the umbilical or auscultation of cardiac sounds—with pulse oximetry, or with a standard electrocardiographic lead.”2”.

6. Persistent bradycardia is usually secondary to inadequate ventilation, thus, intubation is recommended in the event that chest compressions are indicated.”2”.

7. Routinely counted at 1, 5, and 10 minutes of life, the APGAR score, is counted.”2”. Muscle tone and reflex irritability do not significantly aid in the assessment of the newborn during resuscitation. ”2”.

Instead, HR and respiratory effort are the important indicators and should be continuously monitored.”2”. Skin color is a poor indicator of oxyhemoglobin saturation during the first several minutes of life while the transition from fetal to infant circulation ensues.”2”.

8. In this brief period, pulse oximetry may be a useful tool to assess the oxygenation status of the newborn, in only a few select situations—anticipated resuscitation, prolonged PPV use, persistent cyanosis, and use of supplementaloxygen.”2”.

9. Any neonate with persistent cyanosis or signs of respiratory distress (e.g., grunting, nasal flaring, tachypnea) should be assisted by CPAP or PPV. “2”.

10. For apnea, severe respiratory distress, or an HR less than 100 beats/min, BMV(bag mask ventilation) (with a manometer, if available) should be initiated.”2”. Unless otherwise dictated by blood gas levels, recommended ventilation rates are 40 to 60 breaths/min, aimed at achieving a heart rate above 100 beat/min. “2”.

11. When BMV is required for more than 2 minutes, an orogastric tube should be placed to prevent respiratory compromise from gastric distention.”2”.

12. Resuscitation with 100% oxygen is no longer recommended, due to hyperoxia results in increase oxidative stress, including direct cardiac & renal injury.”2”. There appears to be reduced mortality in infants resuscitated with room air, with no obvious evidence of harm & neurological outcomes appear improved likely due to a reduction in cerebral free radical generation.”2”.

Use of 100% oxygen for resuscitation should occur only if the newborn has persistent bradycardia below 60 beats/ min, bradycardia after 90 seconds.”2”. Attempts to restore adequate ventilation are more beneficial than increasing the oxygenconcentration.”2”. Oxygen saturation after birth may not reach 90% or more until 10 minutes of life.”2”.

13. Endotracheal intubation is indicated at several points during neonatal resuscitation; (1) tracheal suctioning for meconium in infants with failure to improve, despite effective PPV; (2) if BMV is ineffective or prolonged; (3) when chest compressions are performed; (4) and for extremely low-birth-weight infants or infants with anatomic anomalies (e.g., diaphragmatic hernia).”2”. If acute deterioration occurs shortly after intubation, equipment must be immediately checked.

14. Needle aspiration of the chest may be considered for treatment of a possible pneumothorax, particularly if unequal breath sounds are upon extubation, ventillatory pressures are high, or a neonate’s condition fails to improve with effective ventilation.”2”.

15. Consider the following precautions when resuscitating a preterm newborn: "13" 1. Handle the baby gently. 2. Do not position the baby's legs higher than the head (Trendelenburg position). 3. Avoid delivering excessive pressure during PPV or CPAP. 4. Use a pulse oximeter and blood gases to monitor and adjust ventilation and oxygen concentration. 5. Do not rapidly infuse intravenous fluids."13".

Resuscitation Medications"2"

Medication	Concentration	Dose	Route	Comments
Epinephrine	1:10,000	0.01-0.03 mg/kg(0.-0.3ml/kg)	IV Preferred or ETT	
Dopamine	Varies	Continuous infusion at 5mcgm/kg/min, increase to20mcgm as needed	IV	
Glucose	D10W	2-4 ml/kg	IV	Avoid high concentration
Volume expanders	O negative packed RBC, N/S, Ringer's lactate	10ml/kg, 10ml/kg, 10ml/kg	IV, IV, IV	Give over 5-10min for acute bleeding, repeat as needed
Ampicillin	Varies	100mg/kg	IV,IM	
Gentamicin	Varies	4mg/kg	IV,IM	
Cefotaxime	Varies	50mg/kg	IV,IM	

MATERIAL AND METHODS

The examination was done for 90 children who visit general hospital in the periphery & admitted to N.I.C.U, during five months(January - May) 2018, their age between one hour & 4 weeks. The following questions were used including: Name, Age, Sex, mode of birth, Gestational age, Weight in kg, date of admission & discharge, RBS, TSB. We divide our patients into groups: 1st group: according to diagnosis; 19 with R.D.S, 17 with Birth asphyxia, 16 with jaundice, 14 with T.T.N, 10 with vomiting, 17 with birth asphyxia, 6 with congenital anomaly, 5 with hypoglycemia, 2 with meconium aspiration pneumonia, 1 with congenital pneumonia. 2nd group: according to sex: 61 male, 29 female. 3rd group: according to mode of birth, 42 with N.V.D, 48 with C/S. 4th group: according to time of admission, 1st month (M1):19, M2:15, M3:17, M4:20, M5:19 5th group: according to gestational age: below or equal to 32 wk: 10; 33-36 wk: 15; equal or more than to 37 wk: 65. 6th group: according to weight: between 0.5-1.4kg: 6; between 1.5-2.9kg: 38, between 3kg-4.5kg: 46. We compare between different groups. Of note: in our study we exclude patients below 26 wk gestational age & a life.

Table (1): Relation between Diagnosis (Dx) & Time of admission in months(M1,M2,…) X^2 = 37.963 p-value > 0.05.

Dx	M1	M2	M3	M4	M5	Total no.
R.D.S	4	6	1	5	3	19
Birth asphyxia	5	3	4	2	3	17
Jaundice	3	3	1	3	6	16
T.T.N	6	2	2	3	1	14
Vomiting			4	5	1	10
Congenital anomaly	1		1	1	3	6
hypoglycemia		2	1	1	1	5
Meconium aspiration pneumonia		1	1			2
Congenital pneumonia					1	1
Total no.	19	15	17	20	19	90

Table (2): Relation between Gender & Time of admission (M1,M2,M3,……) X^2 = o.974 p-value > 0.05.

Gender	M1	M2	M3	M4	M5	Total no.
Male	13	9	11	15	13	61
Female	6	6	6	5	6	29
Total no.	19	15	17	20	19	90

Table (3): Relation between Diagnosis & Gender X^2= 3.666 p-value > 0.05.

Dx	Male	Female	Total no.
R.D.S	14	5	19
Birth asphyxia	13	4	17
Jaundice	10	6	16
T.T.N	8	6	14
Vomiting	6	4	10
Congenital anomaly	5	1	6
Hypoglycemia	3	2	5
Meconium aspiration pneumonia	1	1	2
Congenital anomaly	1		1
Total no.	61	29	90

Table (4): Relation between Diagnosis & Mode of delivery X^2=15.063 p-value> 0.05.

Dx	N.V.D	C/S	Total no.
R.D.S	12	7	19
Birth asphyxia	6	11	17
Jaundice	12	4	16
T.T.N	5	9	14
Vomiting	3	7	10
Congenital anomaly	1	5	6
Hypoglycemia	2	3	5
Meconium aspiration pneumonia		2	2
Congenital pneumonia	1		1
Total no.	42	48	90

Table (5): Relation between Mode of delivery & Time of admission X^2=3.893 p-value >0.05.

Mode of delivery	M	M2	M3	M4	M5	Total no.
N.V.D	10	8	5	8	11	42
C/S	9	8	12	12	8	48
Total no.	19	15	17	20	19	90

Table (6): Relation between Diagnosis & Gestational age (in weeks) X^2= 76.947 p-value < 0.001.

Dx	≤ 32 wk	33-36 wk	≥ 37 wk	Total no.
R.D.S	10	9		19
Birth asphyxia			17	17
Jaundice		4	12	16
T.T.N			14	14
Vomiting			10	10
Congenital anomaly		2	4	6
Hypoglycemia			5	5
Meconium aspiration pneumonia			2	2
Congenital pneumonia			1	1
Total no.	10	15	65	90

Table (7): Relation between Mode of delivery & Gestational age (in weeks) X^2=9.571 p-value < 0.05.

Mode of delivery	≤ 32 wk	33-36 wk	≥ 37 wk	Total no.
N.V.D	9	8	25	42
C/S	1	7	40	48
Total no.	10	15	65	90

Table (8): Relation between Time & Gestational age X^2 = 10.77 p-value > 0.05.

Time	≤ 32 wk	33-36 wk	≥ 37 wk	Total no.
M1	1	5	13	19
M2	3	4	8	15
M3		3	14	17
M4	3	3	14	20
M5	3		16	19
Total no.	10	15	65	90

Table (9): Relation between Gender & Gestational age X^2= 2.473 p-value > 0.05.

Gender	≤ 32 wk	33-36 wk	≥ 37 wk	Total no.
Male	5	12	44	61
Female	5	3	21	29
Total no.	10	15	65	90

Table (10): Relation between Diagnosis & Body weight(weight in kg) X^2= 33.571 p-value < 0.05.

Dx	0.5-1.4 kg	1.5-2.9 kg	3-4.5 kg	Total no.
R.D.S	6	10	3	19
Birth asphyxia		7	10	17
Jaundice		6	10	16
T.T.N		5	9	14
Vomiting		5	5	10
Congenital anomaly		3	3	6
Hypoglycemia		1	4	5
Meconium aspiration pneumonia			2	2
Congenital pneumonia		1		1
Total no.	6	38	46	90

Table (11): Relation between Mode of delivery & Body weight X^2= 8.769 p-value < 0.05.

Mode of delivery	0.5-1.4 kg	1.5-2.9 kg	3-4.5 kg	Total no.
N.V.D	6	19	17	42
C/S		19	29	48
Total no.	6	38	46	90

Table (12): Relation between Age (in weeks) & Weight (in kg) X^2 = 64.991 p-value < 0.001.

Age in weeks	0.5-1.4 kg	1.5-2.9 kg	3-4.5 kg	Total no.
≤ 32 wk	6	4		10
33-36 wk		12	3	15
≥ 37 wk		22	43	65
Total no.	6	38	46	90

Table no. (13): Relation between Gender & Birth weight X^2=3.513 p-value > 0.05.

Gender	0.5-1.4 kg	1.5-2.9 kg	3-4.5 kg	Total no.
Male	2	27	32	61
Female	4	11	14	29
Total no.	6	38	46	90

The Results

Table no.(1): Shows no significant relationship between Diagnosis(different causes of admission) & Time(month) of admission, where the; X^2 =37.96 & p-value > 0.05. Table no.(2): Shows no significant relationship between Gender (male or female) & Time of admission, where the; X^2 = 0.974 & p-value > 0.05. Table no.(3): Shows no significant relationship between Diagnosis & Gender, where the; X^2 =3.666 & p-value > 0.05. Table no. (4): Shows no significant relationship between Diagnosis & Mode of delivery, where the; X^2 =15.057, p-value > 0.05. Table no. (5): Shows no significant relationship between Mode of

delivery & Time of admission, where the; X^2 =3.893, p-value > 0.05. Table no. (6): Shows highly significant relationship between Diagnosis & Gestational age, where the; X^2 =76.947, p-value < 0.001. Table no. (7): Shows significant relationship between Mode of delivery & Gestational age, where the; X^2 = 9.571, p-value < 0.05. Table no. (8): Shows no relationship between Time & Gestational age, where the; X^2 =10.77, p-value > 0.05. Table no. (9): Shows no relationship between Gender & Gestational age, where the; X^2 = 2.473, p-value > 0.05. Table no. (10): Shows significant relationship between Diagnosis & Gestational age, where the; X^2 = 33.571, p-value < 0.05. Table no. (11): Shows significant relationship between Mode of delivery & Body weight, where the; X^2 = 9.423, p-value < 0.05. Table no. (12): Shows highly significant relationship between Gestational age & Body weight, where the; X^2 = 64.991, p-value < 0.001. Table no.(13): Shows no relationship between Gender & birth body weight, where the; X^2=3.513, p-value > 0.05.

DISCUSSION

1. In our study we found in table(1) that patient admitted due to R.D.S more than other patient & Birth asphyxia is the second common cause of admission, with no relation to time, & this agreed with many studies & one of them that done by: SyedR. Ali, Shakeel Ahmed & Heeramni Lohana."10 2. We found in table (2) & (3) no relation between Gender & Time of admission or between Gender & Diagnosis, where the predominance of male indicates that male neonates are more vulnerable during the neonatal period, a finding in agreement with the well described biological survival of girls in the neonatal period, & this agreed with many studies & one of them done by: Saleem, M, ALI, M, Anwar, J, Babar, M.I, Rafi, M, Mahmood, R & Hussain."7". 3. We found in table (4) no relation between causes of admission or Diagnosis & mode of delivery, where R.D.S & Jaundice increase in patient with N.V.D & T.T.N, Birth asphyxia & Vomiting increase in patient with C/S, where Infants born by cesarean section present problems possibly related to the unfavorable obstetric circumstance that necessitated the operation. In normal term pregnancies without any indication of fetal distress, cesarean section delivery carries a greater risk than delivery through the birth canal."1". Although transient tachypnea is the most frequently associated problem with cesarean section, respiratory distress syndrome and persistent pulmonary hypertension may develop, particularly in infants born by cesarean section to women who are not in labor, in those with uncertain dates, and in those born to diabetic mothers or after asphyxia."1". 4. We found in table no.(5) no significant relationship between Mode of delivery & Time where no. of patient admitted to N.I.C U after C/S more than after N.V.D,

This agreed with study done by (THE NEW ENGLAND JOURNAL OF MEDICIN), as compared with infants born vaginally, those born by cesarean section are at increased risk for adverse respiratory outcomes, especially when delivery occurs before the onset of labor.

This increased risk persists even in infants who are delivered by C/S at full term (i.e., at or beyond 39 completed weeks of gestation).”9”.

5. We found in table no.(6) there is highly significant relationship between Diagnosis & Gestational age because the total no. of cases admitted due to Birth asphyxia, T.T.N Meconium A.P, Vomiting (which occurs at 37 wks gestational age & more) more than cases admitted due to R.D.S (younger than 37wks gestational age). 6. We found in table no.(7) there is significant relationship between Mode of delivery & Gestational age, where the number of late preterm births (34-36 wk) has increased owing in part to elective deliveries; late preterm neonates are also at increased risk for morbidity and mortality.”1”. Even term infants born at 37 and 38 wk by cesarean section are at increased risk for respiratory distress syndrome, transient tachypnea of the newborn, suspected sepsis, hypoglycemia, need for ventilator support, and admission to the neonatal intensive care unit.”1”. 7. We found in table no. (8) there is no relationship between Time of admission & Gestational age. 8. We found in table no. (9) there is no relationship between Gender & Gestational age, where Male gender predominant all the time & in most gestational ages, & this agreed with most of studies done about this subject. 9. We found in table no. (10) there is significant relationship between Diagnosis & Body weight, where LBW is caused by preterm birth, IUGR, or both. The predominant cause of LBW in the United States is preterm birth, whereas in developing countries, the cause is more often IUGR. Although IUGR does not appear to further increase the risk of mortality in preterm infants, both morbidity and mortality are increased in term growth-restricted infants."1". LGA(Large for gestational age) infants, regardless of their gestational age, have a higher incidence of birth injuries, such as cervical and brachial plexus injuries, phrenic nerve damage with paralysis of the diaphragm, fractured clavicles, cephalohematomas, subdural hematomas, and ecchymoses of the head and face. LGA infants are also at increased risk for hypoglycemia and polycythemia.”1”. In our study more than half babies are normal weight, & agreed with study done by: Michele. St. Munz. St. Louis Post-Dispatch.”11”. 10. We found in table no. (11) there is significant relationship between Mode of delivery & Body weight , where birth weights affect cesarean delivery rates, & this agreed with study done by Department of Obstetrics and Gynecology, Ravenswood Hospital

Medical Center, University of Illinois at Chicago, USA.A. where cesarean for dystocia increases with birth weights. “12”. 11. We found in table no. (12) there is strong relationship between Gestational age & Body weight ,where prematurity and IUGR are associated with increased neonatal morbidity and mortality.”1”. Neonatal mortality rates decrease with increasing birth weight until approximately 4,000 g, after which they increase. These oversized infants are usually born at term, but preterm infants with weights high for gestational age also have a significantly higher mortality than infants of the same size born at term; maternal diabetes and obesity are predisposing factors. Some infants are constitutionally large because of large parental size”1”. Birth weight, reflecting both gestation & intrauterine growth, is a powerful predictor of mortality & morbidity(e .g, cerebral palsy) in childhood. Globally 60-80% of neonatal deaths occur in low birth weight infants.”14”. Birth weight and gestational age have traditionally been used as strong indicators for the risk of neonatal death.”1”. 12. We found in table no.(13) there is no relationship between Gender & Birth weight, where Birth weight unlike gender is a significant predictor of neonatal outcome.”6”.

CONCLUSION

1. Larger number of patients admitted to N.I.C.U due to T.T.N or R.D.S because they need oxygen, suction & other resuscitative measures in N.I.C.U.

2. More Patients admitted after C/S than after N.V.D, because plenty of fluid stay in the lung & need suction which increase chance of T.T.N, or emergency C/S done due preeclampsia which lead to premature delivery of baby with R.D.S, or C/S of diabetic mother for big baby with hypoglycemia later on, postdate with meconium aspiration, vomiting.

3. When gestational age more than 39 wks complication increase like: T.T.N, jaundice, vomiting, birth asphyxia, hypoglycemia, meconium aspiration pneumonia, congenital pneumonia, & more chance for C/S.

4. When body weight near 4 kg at birth, complications increase like: T.T.N, birth asphyxia, jaundice, hypoglycemia, increase chance for C/S.

5. Male patient more than female in N.I.C.U.

6. Higher birth weight, female gender, singleton birth, and antenatal steroids reduce the risk of neurodevelopment impairment or death.

7. The risk of an adverse outcome increases with decreasing gestational age at birth.

8. Prematurity & IUGR both are risk factors & can lead to neonatal complication.

9. Even term infants born at 37 and 38 wk by cesarean section are at increased risk for respiratory distress syndrome, transient tachypnea of the newborn, suspected sepsis, hypoglycemia, need for ventilatory support, and admission to the N.I.C.U.

10. Although transient tachypnea is the most frequently associated problem with cesarean section, respiratory distress syndrome and persistent pulmonary hypertension may develop, particularly in infants born by cesarean section to women who are not in labor, in those with uncertain dates, and in those born to diabetic mothers or after asphyxia.

11. In recent years it has been recognized that the effects of suboptimal birth weight may persist throughout life, with links being demonstrated between birth weight & cardiovascular & respiratory disease in adulthood. It appears that these adverse effects have a nearly linear relationship with birth weight rather than simply being associated with the lower extreme of the birth weight distribution.”14”.

12. Neonatal outcomes in subsequent pregnancies are worse in women who had a cesarean delivery in their first pregnancy. The choice of a cesarean section does affect a woman’s reproductive future.”8”.

RECOMMENDATIONS

1. Approximately 10% of newborns require some assistance at birth, with 1% requiring extensive resuscitative measures. Knowledge of neonatal physiology, appropriate equipment, and procedural skills are essential to successful resuscitation.”2”.

2. Fetal hypoxia or distress may be diagnosed with moderate success. Treatment, however, remains limited to supplying the mother with high concentrations of oxygen, positioning the uterus to avoid vascular compression, and initiating operative delivery before severe fetal injury occurs. “1”.

3. Pharmacologic approaches to fetal immaturity (e.g., administration of steroids to the mother to accelerate fetal lung maturation and decrease the incidence of respiratory distress syndrome. A single course of antenatal corticosteroids is recommended in pregnancies 24-34

wk of gestation that are at risk for preterm delivery. Antenatal steroids decrease the risk of death, grades III and IV IVH, and PVL in the neonate. The prophylactic administration of low-dose indomethacin (0.1 mg/kg/day for 3 days) to VLBW preterm infants reduces the incidence of severe IVH. "1". Inhibiting labor with tocolytic agents is unfortunately not successful in most patients with premature labor."1".

4. Management of definitely diagnosed fetal genetic disease or congenital anomalies consists of parental counseling or abortion; rarely, high-dose vitamin therapy for a responsive inborn error of metabolism (biotin-dependent disorders) or fetal transfusion (with red blood cells or platelets) may be indicated. "1". The nature of the defect and its consequences, as well as ethical implications for the fetus and the parents, must be considered. In a randomized controlled trial, fetal surgery for myelomeningocele improved neurological function (mental and motor development) and decreased the need for shunts by 50% but increased the prematurity rate."1".

5. Folic acid supplementation decreases the incidence and recurrence of Neural tube defects (NTDs). Because the neural tube closes within the 1st 28 days of conception, periconceptional supplementation is needed for prevention. It is recommended that women without a prior history of a NTD ingest 400 µg/day of folic acid throughout their reproductive years. Women with a history of a prior pregnancy complicated by an NTD or a 1st-degree relative with an NTD should have preconceptional counseling and should ingest 4 mg/day of supplemental folic acid beginning at least 1 mo before conception."1".

6. Careful obstetric monitoring, including non stress testing, biophysical profile, or Doppler velocimetry, usually provides a rational basis for choosing one of three courses: nonintervention, induction of labor, or cesarean section."1".

7. Improved perinatal care is imperative to minimize traumatic brain injury and decrease the risk of preterm delivery."1".

8. High risk pregnant women should be encouraged to deliver in formal health facilities.

9. Preterm infants and those born to mothers with suspected infection, including chorioamnionitis, should receive empirical antibiotic therapy. An acceptable regimen includes dual therapy with ampicillin and gentamicin."1".

10. Infants should meet minimum criteria before hospital discharge."1". Late preterm infants (34-36 wk) and infants with early discharge (before 48 hr) or very early discharge (before 24hr) are at increased risk for rehospitalization."1".

11. An elective cesarean section should be delayed until ≥39 wk of gestation. Earlier delivery increases the risk to the newborns."1".

12. Many of the determinants of both prematurity & poor intrauterine growth remain to be elucidated, although some specific conditions such as pre- eclamptic toxemia are important in individuals."14".

13. Poor intrauterine growth is associated with smoking during pregnancy & with socioeconomic deprivation. Diet has often been suggested as a possible cause of intrauterine growth retardation but good evidence for this is lacking, except for the effects of extreme malnutrition."14".

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