Newborn Complications

Obstetric Nursing
Week 14
November 21, 2002

Identification of High Risk Newborns

- Maternal diabetes
- Maternal narcotics during labor
- Maternal substance abuse
- Fetal asphyxia
- Difficult/prolonged labor causing birth trauma
- Multiple gestation
- Preterm or postterm delivery
- Congenital anomalies
- Maternal or neonatal infection
- SGA or LGA
- Apgar score < 6 at 1 min or < 7 at 5 min

Critical Neonatal Assessment Indicators

- Respiratory: bradypnea, tachypnea, grunting, sighing, & singing; weak or absent respiratory effort
- Cardiovascular: bradycardia, tachycardia or murmur
- Neuromuscular: lethargy, temperature instability, tremors, unusual behaviors such as lip-smacking
- GI: poor feeding tolerance, poor suck/swallow reflex
- Skin color: cyanosis, jaundice (especially within the first 24 hours)
- Obvious major anomalies

Common Procedures/Tests/Equipment

Pulse oximetry

- Palm of hand, sole of foot or finger
- Assess site q 4 hrs & rotate q 12 hrs
- > 95% reflects safe clinical value (premies lower)

Arterial Blood Gas (ABG):

- pH, PaO_2, $PaCO_2$, HCO_3, O_2 sat

Blood glucose monitoring

  - Warm foot prior to increase circulation
  - Use heel, avoid "walking" surface

Common Procedures/Tests/Equipment

Urine specimen collection

- 1 - 2 ml usually sufficient
- Apply to clean, dry skin
  - Females: Enclose urinary meatus & vagina
  - Males: penis & scrotum inside bag
- Check frequently, remove as soon as urine available
- Send to lab or refrigerate
- Some tests allow urine extracted from diaper

Common Procedures/Tests/Equipment

Umbilical lines:

- Umbilical arterial line (UAL or UAC) used for ABGs
- Umbilical venous line (UVL or UVC): IV fluids, meds and blood for lab tests
- Assess for
  - Blue discoloration or blanching on buttocks or extremities indicating emboli or vasospasm
  - Bleeding from umbilicus or disconnected tubing
  - Position infant on side or prone

Common Procedures/Tests/Equipment

Oxygen administration

- Via hood, NC, CPAP or ET
- Warm & humidify to reduce fluid/heat loss
- Administer min. amt to needed to meet needs

Gavage tubes

- To decompress stomach or administer feeds or oral meds
- OG usually better than NG
- Use 5 or 8 Fr.
- Check placement before feeding

Neonatal Complications Related to Size

- Small for Gestational Age & Intrauterine Growth Retardation
  - Birth weight < 10th percentile
  - Associated with conditions causing chronic hypoxia in utero
  - Signs: loose, dry skin, little fat or muscle mass, little scalp hair, hypoglycemia & hypothermia
  - Nsg mgmt depends on problems: prevent cold stress and treat hypoglycemia

Neonatal Complications Related to Size

- Large for Gestational Age (LGA)
  - Birth weight > 90th percentile (≥ 4000 g)
  - Associated with IDM
  - Signs: macrosomia, hypoglycemia, RDS, MAS, hyperbilirubinemia, shoulder dystocia & birth trauma r/t CPD
  - Nsg mgmt depends on problems: treat hypoglycemia, birth trauma, support gas exchange

Prematurity

- < 37th wks; viability is 22-24 wks; uly d/c near EDC
- Complications:
  - Respiratory: lack of surfactant, immature lungs, weak muscles
  - Temperature: minimal SC fat, poor muscle tone, small muscle mass, absent sweat/shiver
  - Infection risk: lack of maternal immunoglobulins, thin skin, low WBC response
  - Immature liver: hyperbilirubinemia, decreased clotting factors, fragile capillaries

Problems r/t Prematurity

- GI: weak suck/swallow & poor gag/cough reflexes until 33-34 wks. Necrotizing enterocolitis (NEC), neonatal disorder r/t immature GI system & hypoxia
- Renal: immature kidneys unable to concentrate urine effectively, dehydration, prolonged drug excretion time
- Neuromuscular: intraventricular hemorrhage (IVH), apnea, poor muscle tone, weak/absent reflexes, weak/feeble cry

Care of the Premature Neonate

- Assess resp status & give O2, monitor for retinopathy of prematurity (ROP)
- Maintain neutral thermal environment via radiant warmer, isolette & kangaroo care
- Monitor for signs of sepsis
- Feed per ability (breast, premie nipple, gavage, cup, SNS) & assess for abd distension
- Monitor for hypoglycemia ,hyperbilirubinemia & hemorrhage
- Careful skin care & positioning to prevent breakdown

Problems r/t Postmaturity

> 42 wks gestation

- Increased risk of asphyxia & meconium aspiration, birth trauma
- Signs: absence of vernix, minimal lanugo, dry, cracked skin, hypoglycemia, minimal subcutaneous fat, skin and cord yellow/green, long fingernails & scratches on face
- Nsg mgt: assess for meconium at delivery, birth trauma and hypoglycemia

Problems r/t Birth Trauma

Facial paralysis:

- From pressure on facial nerve during delivery
- Affected side unresponsive when crying
- Resolves in hours/days

Erb's Palsy (Erb- Duchenne Paralysis)

- Associated with stretching or pulling head away from shoulder during delivery
- Signs: Flaccid arm, elbow extended, hand rotated inward, Moro & grasp reflexes absent on affected side
- Requires immobilization & reposition q 2 to 3 hrs

Problems r/t Birth Trauma

Fractured clavicle

- Bone most frequently fractured during delivery
- Associated with CPD
- Signs: limited ROM, crepitus, absent Moro reflex on affected side
- Heals quickly, handle gently, immobilize arm

Asphyxia:

- Inadequate tissue perfusion
- Signs: acidotic scalp or cord pH
- Low Apgar score (< 4 at 1 min)
- Begin resuscitation immediately

Neonatal Respiratory Distress

Common causes:

- RDS: uly preterm infants
- Meconium aspiration syndrome (MAS): uly term & postterm infants
- Transient tachypnea of the newborn (TTN): delayed fluid absorption in lungs; uly term & postterm infants

Signs:

- Tachypnea, intercostal retractions, nasal flaring
- Expiratory grunting, diminished breath sounds
- PaO2 <50, PCO2 >60
- Central cyanosis (late finding)

Respiratory Distress Interventions

- Radiant warmer or isolette to maintain neutral thermal environment & prevent cold stress; oxygen demands increase if neonate is cold.
- Warmed, humidified oxygen
- Withhold feedings if RR > 60 breaths/min
- Position side lying or supine with neck slightly extended
- Suction PRN to maintain a patent airway
- Monitor oxygen saturation and/or ABGs as ordered

Respiratory Distress Syndrome (RDS)

- Primarily associated with infants < 37 wks
- Associated with insufficient surfactant production & inadequate # & maturity of alveoli
- Respiratory failure is most common cause of death in preterm infants
- Signs of distress typically develop in 1-6 hrs: tachypnea, grunting, flaring, retracting, cyanosis & rackles
- Nsg mgt also may include exogenous surfactant (given at birth if <1250g or when RDS dx confirmed)

Meconium Aspiration Syndrome (MAS)

- Prenatal asphyxia causes relaxation of anal sphincter & passage of meconium into amniotic fluid
- Fetus/infant inhales meconium into airway
- Forms mechanical obstruction; air can be inhaled but can't be exhaled; lungs become hyperinflated
- Irritating to airway, causing chemical pneumonitis
- Signs: fetal distress, Apgar score < 6 @ 1 & 5 min, distended, barrel-shaped chest, diminished breath sounds, yellow staining of skin, nails & cord

MAS Interventions

- Suction oropharynx & nasopharynx after head is born & shoulders and chest still in birth canal
- Endotracheal suctioning indicated before stimulating respirations unless infant crying & vigorous
- Administer O2 and anticipate need for ventilation
- Perform chest physiotherapy routinely

Transient Tachypnea of the Newborn (TTN)

- Failure to clear airway of excess fluid at delivery
- Primarily term infants, especially if C/S (miss mechanical squeeze of vaginal delivery)
- Signs: grunting, flaring, mild cyanosis, tachypnea, respirations can be as high as 100 to 140 breaths/min
- Nsg mgt: O2 as needed to maintain PO2
- Usually resolves within 72 hours

Cold Stress

- All newborns at risk for hypothermia
- Keep temp 97.6-99.2 by
  - Neutral thermal environment: delay bath until temperature stable; dry iimmediately after bath
  - Under warmer or skin to skin after delivery
  - Wrap with warm blankets Put on hat
- If < 97.6
  - Check O2 sat and blood glucose
  - Chronic hypothermia can be early sign of sepsis

Hypoglycemia

- Blood glucose < 40 mg/dl in term newborn
- At risk: IDM, SGA, premature, infants with cold stress, hypothermia, delayed feedings
- Poor prognosis if not treated
- Signs: tremors, jitteriness, lethargy, decreased muscle tone, apnea, anorexia
- Check blood glucose of at-risk infants by 1 hr of age, (30 min if IDM) & on any symptomatic newborn
- Nsg mgt: feed (breast or bottle) or give D5W or D10W & reassess glucose before next feeding

Infant of a Diabetic Mother (IDM)

- Maternal glucose crosses placenta, fetal pancreas secretes more insulin to metabolize glucose; increased insulin decreases surfactant production.
- Signs: LGA, hypoglycemia, RDS, false positive L/S ratio, increased risk for congenital anomalies (especially cardiac and spinal)
- Ns mgt:
  - Assess for birth trauma
  - Blood glucose at 30 min and 1, 2, 4, 6, 9 12 and 24 hours
  - Treat hypoglycemia

Newborn Sepsis

- Group B streptococcus most common cause complicated by immature immune system & lack of IgM
- Assoc with PROM, long labor & maternal infection.
- Signs: lethargy, seizure activity, pallor, hypothermia, poor feeding, respiratory distress, apnea, tachycardia, bradycardia, hyperbilirubinemia
- Nsg mgt: cultures obtained (blood, urine, CSF) and antibiotics started. After 72 hrs, treatment stopped if culture negative & asymptomatic. Continues for 10-14 days if culture reports positive

Hyperbilirubinemia

- Bilirubin is breakdown of hemoglobin from RBCs
  - Direct (conjugated): water-soluble, easier to eliminate
  - Indirect (unconjugated): fat-soluble, harder to eliminate, can cross blood-brain barrier
- Kernicterus: complication of hyperbilirubinemia; bilirubin deposits in basal ganglia of brain causing permanent impaired neurological function. Bilirubin level, gestational age, condition & fluid-calorie balance influence risk of kernicterus

Physiologic Jaundice

- Physiologic jaundice usually begins after 24 hours of life
- Normal newborn has twice as much bilirubin as adult (more RBCs and immature liver
- Risk factors:
  - Resolution of a closed hemorrhage
  - Infection
  - Dehydration
  - Sepsis

Pathologic Jaundice

Begins in first 24 hrs

- Rh incompatibility:
  - Maternal antibodies from Rh+ mom cross placenta and enter bloodstream of Rh+ fetus, attacking fetal RBCs, causing hemolysis & fetal anemia.
  - Erythroblastosis fetalis: hemolysis causing severe anemia, cardiac decompensation, edema, ascites, hypoxia & fetal death
  - Rhogam cannot reverse of antibody development.
- ABO incompatibility
  - If mom has type O blood & fetus has type A, B or AB, same mechanism with less severe reaction

Jaundice Assessment

- Golden amniotic fluid indicates severe hemolytic disease
- After birth:
  - If mom Rh- (or type O blood), use cord blood to determine infant's type & Rh.
  - If infant Rh+ (or type A, B or AB), direct Coombs test will detect presence of maternal antibodies
- Assess for jaundice by pressing on sternum or forehead; in dark-skinned infants, assess sclera, palms & soles of feet
- Hyperbilirubinemia: total bilirubin level >15 mg/dL

Jaundice Interventions

Early & frequent feedings to stimulate peristalsis
Assess for loose, green stools
Phototherapy: exposing infant to ultraviolet light rays

- Cover infant's eyes & remove covering q 2 hrs
- Undress to maximize exposure
- Increase fluid intake to prevent dehydration

Exchange transfusion

- Used to quickly decrease high bilirubin levels
- Only Rh neg blood used to decrease risk of transfusion reaction
- Blood warmed to prevent cardiac arrest
- Calcium gluconate given after each 100 ml

Fetal Alcohol Syndrome (FAS)

Etiology:

- Alcohol crosses placenta & interferes with protein synthesis, increasing risk of congenital anomalies, mental deficiency & IUGR

Assessment:

- SGA, small eyes, flat midface, long, thin upper lip, flat upper lip groove, irritable, hyperactive, high-pitched cry

Nsg mgt

- Reduce environmental stimuli
- Swaddle to increase feelings of security
- Sedatives for withdrawal side effects

Neonatal Abstinence Syndrome (NAS)

- Etiology: repeated intrauterine drugs exposure causes fetal drug dependency, degree of withdrawal depends on type & duration of addiction
- Signs:
  - Hyperactivity, jitteriness & shrill, persistent cry
  - Frequent yawning & sneezing, nasal stuffiness
  - Sweating
  - Absence of “step” & “head-righting” reflex
  - Developmental delays
  - Feeding difficulties (vomiting, regurgitation, diarrhea) increased need for non-nutritive sucking

Neonatal Abstinence Syndrome

Nsg mgt:

- Position infant on side to facilitate drainage of mucus
- Suction PRN to maintain patent airway
- Decrease environmental stimuli, swaddle for comfort
- Intake & output, daily weight
- Obtain meconium and/or urine for drug screening
- Meds may include paregoric elixir, thorazine & Valium, methadone, phenobarbital
- Pacifier for non-nutritive sucking
- Don’t give Narcan to infant born to narcotic addict