Nursing Care of Surgical Neonate

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Newborns who require surgery are those usually born with congenital defects and often requiring emergency and surgical intervention. The anesthesia, surgical technique and correction of these physical defects can make the newborn critically ill. As the physiology is so unstable in the extrauterine life, there could be marked fluctuations in the temperature regulation, fluid and electrolyte balance, cardiovascular functioning and metabolic processes. Skillful observations and interventions are extremely important. The surgical neonatal nurse therefore has a significant role to play in the pre and postoperative management and reducing the morbidity and mortality of the neonate.

Qualities of the nurse
The qualities of the nurse for providing competent nursing care to the surgically ill neonate demands a profound base of theoretical knowledge for application into practice. Expert technical skills, quickness in discretion and judgment and effective communication skills are vital. Skillful observation helps to identify changes in the physical appearance and physiological parameters. The nurses’ sensitivity, sympathy and supportiveness towards the family enables them to cope and gain confidence with this crisis situation.

Common Neonatal Surgical Conditions
The common surgical conditions in newborns are as follows: Diaphragmatic hernia, Tracheo esophageal fistula, Intestinal obstruction, Anorectal malformations, Necrotizing Enterocolitis with perforation, Gastrochisis, Omphalocele, Meningo mycoccce, Acute abscesses, Duodenal atresia, Extrophy of bladder, Pyloric stenosis.

Care Aspects Of A Surgical Neonate
The aspects of care of a surgical neonate include preoperative and postoperative care.

Pre Operative Care
Most of the problems encountered with the neonate undergoing surgery are in relation to the high risk neonate (e.g. airway maintenance, cardiovascular support, thermoregulation, fluid and electrolyte balance and nutritional needs.) Some congenital defects are often associated with other anomalies, therefore assessment should include evidence of complications related to these.

Preoperatively, the newborn will require a thermoregulated and sterile environment. Close monitoring of the responses of the newborn is imperative. Physical assessment is mandatory to detect and report any abnormalities. The specific care aspects are as follows:
- Check ventilatory status, start an intravenous line, administer Inj. Vitamin K 0.5 to 1.0 mg im/iv, provide psychological support to parents, provide warmth and comfort, monitor vital signs, administer antibiotics as prescribed, give meticulous skin care, ensure hygienic needs of the neonate. No premedication is administered for a neonate. Confirm
drainages are well secured, functioning and draining well i.e. nasogastric drainage, etc. Protect and treat open lesions, measure (abdominal girth, head circumference, etc.) as per order. Implement specific care related to the diagnosis and nursing problems. Transport to the operating room.

Post Operative Care
Surgery imposes a significant stress on the neonate, especially the preterm infant. The assessment and observation remain much the same as for preoperative care. The additional care is related to surgery, anesthesia and pain. The postoperative care includes

- Immediate Postoperative care
Receive the neonate from operating room, place the infant in the recovery position. Connect to the ventilator as per order, Connect the infant to the monitor to assess the vital signs. Monitor Glasgow Coma Scale, observe for hemorrhage from the surgical site; Aspirate, measure and connect tubings to drainages as indicated.

- Airway Maintenance and Ventilation
Promote a patent airway, provide gentle suctioning and remove secretions, place the neonate in semi Fowler's or lateral position as indicated. Administer oxygen therapy, comply with ventilator management protocol if child is on ventilator. Monitor respiratory status, monitor oxygen saturation with pulse oximeter. Monitor and observe skin color. Maintain blood pH within 7.35-7.45, PO2 between 60-80 mm Hg P Co2 between 25-30.

- Circulation and Tissue Perfusion
Ensure adequate cardiac contraction and circulating blood volume. Check and replace losses due to bleeding. Monitor pulse rate, heart rate, blood pressure and ECG on the monitor. Check capillary refilling and peripheral perfusion. Note the color and temperature of extremities.

- Thermo Neutral Environment
Monitor axillary temperature hourly. Nurse the neonate in an incubator or radiant warmer, avoid unnecessary exposure, give fluids, blood and blood products after warming to room temperature. Maintain the environment at normal room temperature.

- Fluid and Electrolyte Maintenance
Postoperatively keep the neonate nil orally for 5 to 10 days. Evaluate the hydration status (over hydration vs. dehydration) by weighing the infant post-operatively. Check source of fluids and electrolytes losses. Check and replace losses due to vomiting and nasogastric drainages. Monitor electrolytes: Sodium-135-145 meq/l, Potassium-3.5-5 meq/l, Calcium-8.5-10 meq/l. Administer intravenous fluids (100 ml/kg body wt) and electrolytes as prescribed. The concentration of the solution depends on the weight of the infant, volume to be replaced and the glucose requirement (i.e.) 10% dextrose. Fluid restriction is indicated in pneumonia Cardio Vascular System (CVS) and Central Nervous System (CNS) dysfunction by 20 - 25%. Fluid increment is indicated in phototherapy and

<p>| Fluid Administration in a Newborn practiced in the Nursery of Christian Medical College, Vellore. |
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<th>Day</th>
<th>Volume ml/kg/day</th>
<th>Glucose gm/kg/day</th>
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radiant warmer. If the urine output is less than 1 ml/kg/hour, inform the surgeon. Maintain intake – output chart. Restrict fluids as per order. The additives in fluid replacement are trace elements, vitamin k, plasma, magnesium calcium, heparin solution for central line (5 units / ml). Check bicarbonate levels. Analyze and interpret for signs of metabolic acidosis. Avoid administration of soda bicarbonate in preterm neonates. Treat the term neonate with soda bicarbonate only if the ventilation is adequate.

**Nutrition**

If the neonate is alert, start on NG tube feeds before administering feeds, check for abdominal distention and auscultate for bowel sounds. After the feeds, observe for discomfort abdominal distention and vomiting. If symptoms are absent, initiate breast feeding. Check the Glucose random blood sugar (GRBS) every 2 hours, using glucometer. If the newborn has hypoglycemia, that is GRBS < 50 mg % give expressed breast milk (EBM) if on NG tube feeds or oral feeds. Check GRBS after an hour. If normal, continue to monitor. If still hypoglycemic, administer 10 % dextrose 60 ml / kg body weight intravenously over a period of 4 to 8 hours.

**Pain Management**

Determine the cause of pain which includes rise in BP, increase in intra cranial pressure, reduced PO2, surgical procedures and various invasive procedures performed on the neonate. Assess pain using the neonate pain scale. Implement comfort measures (ie positioning, using comfort device and bonding with the mother). Administer analgesics such as Inj Morphone or Inj. Midazolam or Inj. Fentanyl by infusion. Inj. Pavalon is used in case of diaphragmatic hernia repair as a muscle relaxant.

**Wound Care**

Observe incision site and skin status. Observe dressing for bleeding, determine amount of output from drainage tube. Apply dressing as recommended. If blood or fluid is oozing through the site, reinforce the dressing. Outline the blood stain on the dressing. If bleeding increases remove dressing and replace another aseptically. Assist for suture removal by 7th to 9th day.

**Bladder care**

If the neonate is on continuous bladder drainage measure Q1 hourly urine output, remove catheter if urine is clear after 8 hours. Administer urinary antibiotics if necessary.

**Prevention of Nosocomial Infections**

Observe for evidence of sepsis. Follow strict aseptic technique and hand washing. Administer prophylactic antibiotics, clean central line catheters with butadiene before administering injections. Ensure bath, periodical eye care, mouth care umbilical; and catheter care. Restrict visitors. Change foot wear, gown before entering neonatal ICU. Use mask as needed. Send throat swab of staff periodically. Ensure disinfection and fumigation of the neonatal ICU as needed. Ensure regular microbiology surveillance of the ICU.

**Preparation for Discharge**

Ensure physical healing. Ensure restoration of the neonatal condition. Provide with regular appropriate health education for parents. Insist on regular follow up care. Reassure them and meet the psychological and spiritual care of the parents.

**Conclusion**

Being a care taker of a surgical neonate demands a lot of skill, expertise, concern and anticipation. Recognition of problems and early treatment goes a long way in determining the outcome of a surgical neonate. Pediatric nurses should learn to identify and intervene appropriately.

**Bibliography**