

Bharati Vidyapeeth(Deemed to be University) Pune

College of Nursing

Dhankawadi,Pune-411043 (INDIA)

IAPNEOCON 2018

(11th National Conference of IAP Neonatology Chapter)

MAHANECON 2018

(15th Annual Conference of State Chapter of NNF(Maharashtra))

& NEOHEMODYNAMICS 2018

Organised by: Indian Academy of Pediatrics, Pune Branch

State Chapter of National Neonatology Forum (SCNNF)

Nursing CME

28th September, 2018



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Date :
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Venue :
Auditorium, Bharati Vidyapeeth Medical College, Pune 411043.

MESSAGE



Dr. (Mrs.) Nilima Bhore
Dean & Principal,
Bharati Vidyapeeth,
College of Nursing, Sangli

The focus of neonatal nursing has shifted from a highly technical approach to one of the supportive interventions & a more individualized developmental approach.

Neonatal nurses now a day's serves a variety of roles, from teaching in various setting to rendering hands-on care in hospitals or clinic. Taking care of children involves self-awareness that one must be patient enough about kids as well as consider the fundamentals of child psychology especially the developmental stages. Since children could not sometimes utter what they really felt whenever they are sick, careful assessment and an experienced "clinical eye" must be employed.

Neonatal nursing yesterday

Typical work activities that the neonatal nurses were doing may vary, but they include: Assessing, observing and reporting on the condition of neonates; Preparing **pediatric** patients for routine treatment ; Supporting, advising and educating patients and close relatives; Observing strict hygiene and safety rules and ensuring that visitors also observe any rules on the ward or unit; Writing reports and updating records before completing a shift.

Neonatal nursing today

Today neonatal nurses should be trained to meet the growing demand of the health care industry. There is a need to train the nurses in the area of pediatric nursing especially neonatal nursing that can be done by the leaders in this field Expanded role of pediatric nurse include Advanced Practice nurse, Clinical nurse specialist, Nurse anesthetist, Primary care giver, Pediatric Nurse Practitioner, Nurse administrator, Nurse researcher, Health Educator, Coordinator and Collaborator, Nurse Advocate, Nurse Consultant, Case Manager, Recreationist, Social Worker, Counselor, Leader. Extended role of pediatric nurse include Primary care giver, Case Manager, Parish Nursing, Nurse

Advocate, Counselor, Communicator, Collaborator, Educator, School health nurse, Public health nurse, Pediatric home care nurse, Hospice nurse, Rehabilitation nurse, Infection control nurse. Extending the scope of the nurse's role is essential to provide equal access to health care for all consumers. There is need to establish innovative curricular designs in health science centers with increased financial support for nursing education, Need to advocate for commonality of nursing licensure and certification, including a model nursing practice law suitable for national application, Need for research related to cost-benefit analyses and attitudinal surveys to assess impact of new role .

Neonatal nursing tomorrow

Neonatal nurses can work and are working at their best for the pediatric population. There will be more roles that they will be serving in future. In the developed countries neonatal nurses are performing these roles but because of lack of prominent leaders in this field, in developing countries these roles are lacking. Some of the roles are; Nurse entrepreneur, Tele nurse, Forensic nurse, Peace Corps nurse, independent neonatal nurse practitioner and independent neonatal nurse consultant.

Neonatal nurses are highly skilled health care providers who are equipped to fill the void on inpatient hospital teams and often fill roles that are considered "hospitalist" positions. Neonatal Nursing is a challenging and rewarding career. Nurses who specialize in neonatal nursing commit their skills and knowledge to care for neonates and their families. This rewarding opportunity is fast-paced, challenging, as well as heart breaking at times. A neonatal registered nurse provides preventive care as well as care for immediate illness and can work in various settings as they focus on one segment of the population.

I congratulate the organizing team of Bharati Vidyapeeth (Deemed to be) University, College of nursing, Pune for organizing the workshop & wish all the participants a blessed stay in a beautiful campus of Bharati Vidyapeeth.

MESSAGE



Dr. (Mrs.) Bhagyashree Jogdeo

Assistant Professor & H.O.D.

Child Health Nursing

Bharati Vidyapeeth, (Deemed to be) University,
College of Nursing, Pune

Improvement in neonatal health care has visibly emerged as a mandatory step for attaining the Millennium Development Goal- 4 that aims at dropping neonatal mortality rate. In India 50 % of under five child occur in neonatal period. Since 99% of neonatal death occur in middle and low income countries, disseminated and translated into action. The essential newborn nursing care is such tool for use in India and in other developing countries.

Care of neonates in small hospitals is largely shouldered by our nursing colleagues. It is the nurses who primarily provide the life saving interventions to the neonate's .Nurses have an important role in all clinical disciplines, but for neonatal care their role as skilled professionals with human touch is central. This CME for Nurses aims to strengthen their core competence. The focus is on knowledge and the approach is participatory. We proudly believe that this CME for nurses organized for encouraging the budding nurses who are working in neonatal intensive care unit. I would like to congratulate the delegates who will be benefitted by this.

I am sure this CME will contribute toward saving many newborn infants in years to come.

IAPNEOCON 2018, MAHANECON-2018, NEOHEMODYNAMICS-2018

Pune branch state chapter of NNF, Hosted by BVDUCON – Pune

PROGRAMME SCHEDULE

TIME	TOPIC	RESOURCE PERSON
9:00am – 9.30am	INAUGURATION	
9.35am-10.05am	Identification and monitoring of high risk Newborn	Dr. Shweta Kulkarni Assoc. Prof.D.Y. Patil College of Nursing - Pune
10.10am – 10.40am	Skin care in New born	Dr. Bhagyashree Anil Jogdeo Assist. Professor,BVDUCON –Pune
10.40am-11am	TEA BREAK	
11.05am -11.35am	Thermoregulation in Newborn	Dr.Nilima Bhore Dean, Faculty of Nsg, BVDU, Pune & Principal, BVCON, Sangli
11.40am - 12.10pm	Pain management in Newborn	Lt. Col. Rekha Bhattacharya Professor,AFMC- College of Nursing, Pune
12.15pm – 1.00pm	Nutritional requirement in Newborn	Dr. Jyoti Naikare Principal,Singhad College of Nursing - Pune
1pm – 02.00pm	LUNCH	
2.00pm – 2.30pm	Fluid and electrolyte management in high risk Newborn	Dr. Nancy Fernandes Principal,L.T. College of Nursing, Mumbai

2.30pm- 3.00pm	Birth Asphyxia	Sr. Bridget Nurse Educator,B.J. Wadia Children Hospital- Parel
3.00pm – 3.30pm	Neonatal Jaundice	Mrs. Samrudhi Bhaare Assist. Professor,Sadhu Waswani College of Nursing –Pune
3.30pm - 4.30pm	Panel Discussion Topic- Infection Control in NICU	Moderator – Mrs. Jaya John Professor , Sadhu Waswani College of Nursing –Pune Panellist- <ol style="list-style-type: none"> 1. Lt. Col. V. Radha Principal and Professor,College of Nursing, Loni, Pravara. 2. Mrs. Silli Dominic NICU Incharge,Denanath Mangeshakar Hospital, Pune. 3. Mrs. Bhavana M.Kale NICU Incharge,Sasoon General Hospital, Pune. 4. Mr. Johnson Varghese Infection Control Nurse, Sahyadri Hospital- Pune 5. Mr. Shivcharan Gandhar C.I., BVDUCON- Pune. 6. Mrs. Arti Patharkar NICU Incharge,KEM Hospital,Pune 7. Mrs. Vinaya Sanjay Nimbire NICU Incharge, Bharati Hospital and Research Centre, Pune.
4.30pm – 5.00pm		VALEDICTORY

“Identification And Monitoring Of High Risk Newborn ”

**Dr. Mrs. Shweta S. Joshi,
Dr. D. Y. Patil College of
Nursing, Pune**

High Risk Newborn: A newborn, regardless of gestational age or birth weight, who has a greater than average chance of morbidity or mortality because of conditions or circumstances superimposed on the normal course of events associated with birth and the adjustment to extra uterine existence.

Conditions Associated

- **Maternal conditions**
Age, infertility, DM, Thyroid, Renal diseases, UTI, HT, Anemia, infections etc.
- **Fetal Conditions**
Multiple birth, fetal growth & size, position, acidosis, polyhydramnios, oligohydramnios.
- **Conditions of labor and delivery** PROM, Premature labor, long labor, meconium stained amniotic fluid, prolapsed cord, Cesarean section, anesthesia, Placental anomalies
- **Immediate neonatal conditions**
Prematurity, APGAR, Foul smell of amniotic fluid, Postmaturity

Classification of High Risk

1. Classification according to Birth weight

- LBW
- VLBW
- ELBW

2. Classification according to Gestational age

- **Premature (preterm) infant:** an infant born before completion of 37 weeks of gestation, regardless of birth weight.
- **Full-term infant:** an infant born between the beginning of the 38 weeks and the completion of the 42 weeks of gestation, regardless of birth weight.
- **Post mature (post term) infant:** an infant born after 42 weeks of gestational age, regardless of birth weight.

3. Classification according to mortality

- **Live birth:** birth in which the neonate manifests any heartbeat, breathes, or displays voluntary movement, regardless of gestational age.

- **Fetal death:** death of the fetus after *20 weeks of gestation* and before delivery, with absence of any signs of life after birth.
- **Neonatal death:** that occurs in the *first 27 days* of life.
- **Early neonatal death** occurs in the first weeks of life; late neonatal death occurs at 7-27days.
- **Perinatal mortality:** total number of fetal and early neonatal deaths per 1000 live births

4. Classification according to Pathophysiologic problems

- Associated with the state of maturity of the infant. Chemical disturbances.
e.g: hypoglycemia, hypocalcemia.
- Immature organs and systems. e.g hyperbilirubinemia, respiratory distress, hypothermia.

Monitoring

1. PHYSICAL ASSESSMENT

- General Assessment - Weight, length and head circumference should be plotted on appropriate growth chart after correcting for the gestational age at birth.

2. THERMOREGULATION-

A. Newborn characteristics leading to heat loss

1. Thin skin and proximity of blood vessels to surface increase heat loss
2. Little subcutaneous fat to protect against heat loss
3. Heat is readily transferred from internal areas to cooler skin surfaces
4. High proportion of surface area to body mass
5. Lose heat at a rate four times faster than an adult
6. Conserve heat by assuming a position of flexion
7. Preterm infants at risk for cold stress
 - a. Do not assume position of flexion because of decreased muscle tone
 - b. Thinner skin than full-term infant

GLUCOSE & CALCIUM

Serum glucose is below 40 mg/dL

Signs& Symptoms: jitteriness, lethargy, poor feeding, high-pitched cry, irregular respirations, cyanosis, seizures

Risk factors: DM, PIH, preterm, post term, LGA, cold stress, maternal intake of ritodrine or terbutaline

3. INFECTION

Signs and symptoms of infection such as redness, hyperthermia (rare), Increase leucocytes count.

“Skin Care of Newborn”

At birth a newborn leaves a warm, sterile, fluid environment and enters a dry, gaseous and bacteria filled environment. Skin, the largest organ of the body, serves many functions after birth that include thermoregulation, a barrier to water loss and chemicals, infection control, insulation and fat storage and acid mantle formation., antimicrobial defense, protection from trauma, environmental toxins and ultraviolet radiation, synthesis of vitamin, immune surveillance and cosmetic function. It also serves as a sensory organ and facilitates mother-child attachment. The birth of the baby represents a sudden transition from the intrauterine life to the external environment. Although the skin of the newborn has similar structural components as that of an adult, it differs in some characteristics from adult skin.

Principles of skin care of the newborn-Gentle cleansing.Adequate hydration.Moisturization of skin
Prevention of friction and maceration.Protection from Irritants and bright sunlight

Role of Vernix caseosa- Maintain hydration,Thermoregulation,Innate immunity,pH balance

Bathing the newborn- After stabilization of temp.& hemodynamically stable (2-6 hrs after birth)

Bath should not last more than 5 minutes.More hydration reduce friction capacity .Water-Potable clean/sterile (for 1st bath If possible).Gloves for Initial bath.Soap/cleansers are best to avoid for first few weeks.Temperature of water-37 degree cent.

Cleansing agents can damage the skin as follows:-

1. Disturb integrity of hydrophilic film
2. Triggers the skin irritation
3. Increase the pH of the skin
4. Dryness, roughness, flakiness

Syndets - non-soap surfactants pH closure to normal skin –less irritating, micro flora remain same but can cause the dryness. Super fatting e.g. paraffin, mineral oil etcSyndets+ surfactant, emollients. This can be use without water.

Recommendations- Nothing should be applied to the skin of any baby without careful consideration of the potential hazards .Soaps with alkaline pH should not be used in the neonatal period.For healthy term neonate-Neutral or slightly acidic pH. gentle surfactant, with emollient, physically and chemically stable can be used but quantity should be minimum

Significance and adverse effect of Baby Powder- Useful to absorb the moisture.Prevent maceration

Can block the sweat gland ducts. Miliaria formation.Talcum powder pneumonia .Best to avoid in neonatal period

Care of diaper area- Frequently change in napkins whether home made or super absorbent. Skin needs to be dried and aired between nappy change. Physiological barrier--Apply the mineral oil.Wipe the area from

front to back. In case of rash –petroleum jelly/zinc oxide .Home laundered diaper-wash in lukewarm water dry in sunlight

Cradle cap

Over activity of the sebaceous glands characterized by excessive secretion of sebum resulting in an oily coating, crusts, or scales on the skin.

It's completely harmless, not contagious, and usually disappears

Emollients-Purposes are to decrease peeling, scaling, dermatitis, Maintain barrier function, Reduce irritation. Good for massage

Two types of emollients- Oil in water emulsion – Cream and Water in oil emulsion – Ointment

Different forms -----Hydrocarbons- Vaseline/paraffin. Waxes – Lanolin. Oils-coconut /olive/palm/ground nut /mustard

Almond oil – Better to avoid for massage

Mustard oil – Volatile ,can cause dermatitis.

Coconut oil -It is time tested, small molecular structure, ideal for dry skin, cost effectiveness

In hot weather oil can increased occlusion of sweat pores in NB.

In CCU - Preterm may be bathed daily after 5-6 weeks after birth .Full Term may be bathed daily after 1 week . Ensure the equipment is disinfected before and after procedure. Preterm more than 1000gm, sponge under neck, arms and groin only. Use pH neutral cleanser. Allow natural detachment (7-10 days) if delayed watch for signs of infection

Humidity in nicu –Important to Reduce the skin injury, heat loss , TEWL

Recommendation –It shd starts from 75-85% .More than 85% gives temp. instability and cause skin maceration. 28-30 wks - If temp. is stable after 24 hrs, 85% humidity can be reduced by 5% each day. <28 wks –Maintain 85% humidity x7days, can be reduced by 5% each day if temp. stability allows.. Humidity shd be discontinued when a level of 50% is reached and temp. stability allows.

Prevention of skin injury and breakdown

Epidermal stripping –Primary cause for skin breakdown

Adhesives-Break the skin integrity or sensitivity to adhesive

Recommendations- Minimum use of adhesive. Delay removal of adhesive at least after 24 hrs..Gentle remove adhesives with warm water soaked soft gauze. Avoid spirit(Irritation)and may absorb percutaneous..ELBW use Gel electrodes

Surgical wounds- Care includes On going assessment, Inspection of wound edges, Skin integrity ,Redness, Discoloration, Swelling ,warmth

Pressure Injury

Immobility- Reposition with each care, Document on nurses records.

Devices-Bubble sheet.On CPAP-Check nasal septum regular Be sure that prongs must never rest on the septum , CPAP hats needs to remove and check head & ear for pressure injury.Avoid pressure from equipment.Sharp object and scratches

Extrinsic factors-Reduce friction /rubbing injuries. protect knees and elbow. Avoid moisture ,Adequate nutrition

Skin excoriation-When epidermis is traumatized due to any factor which can lead to external trauma, infection ,scratching. Minor injury in high risk neonate increases the further injury

Recommendation for skin excoriation- Assess the neonatal skin condition frequently and Document the observations .Treatment for excoriation – clean wound with warm sterile water ,apply oint. or use a transparent dressing (promote moist healing),it shd be left in place until it become loose ,reapplication may damage more skin.

Neonatal skin condition score

Dryness		Erythema		Breakdown	
1	Normal no signs of dryness	1	No evidence of erythema	1	No evidence
2	Dry skin ,visible scaling	2	Visible erythema,<50% of BSA	2	Small localized area
3	Very dry skin, cracking fissures	3	erythema,>50% of BSA	3	Extensive
Score 1-3 for each category, Perfect score =3.Worst score =9					

Prevention by ensuring adequate taping of cannula with transparent dressing.Observe the site hourly - NVIP score.In c/o extravasation stop infusion To prevent dermal necrosis & sloughing - vasoconstrictors are used e.g. Adrenalin, dopamine etc.

Chemical Burn- Use of skin disinfectant is never completely safe for baby.Selection of disinfectant should be based on evaluating risks and benefits .NB less than 1500gm,first 7 days the risk of skin injury is more with chlorhexadine gluconate

Conclusion

The skin of the newborn is susceptible and sensitive to trauma and infection and requires special care.All soaps cleansers, powders, syndets should be used with proper indications and cautious judgmentIn NICU handle these diamonds with special consideration

“THERMOREGULATION IN THE NEONATE”

Dr.(Mrs.)NILIMA BHORE
Dean , Faculty of Nursing &
Principal
B.V(D.U)College of Nursing. Sangli.

Why Worry About Thermoregulation?

Body temperature is one of the primary vital signs. In terms of ABC's think:

- A - Airway
- B - Breathing
- C - Circulation
- D - Degrees

Goal of Thermoregulation

Maintain correct body temperature range in order to:

- maximize metabolic efficiency
- reduce oxygen use
- protect enzyme function
- reduce calorie expenditure

Challenges of thermoregulation in Neonatal care

- Maintenance of body temp is a major task.
- Skin is thin & blood vessels are close to the surface.
- Have little subcutaneous fat to serve as barrier to heat loss.
- Term Infants have 3x the surface to body mass of an adult.
- Preterm infants and SGA infants have 4x the surface mass to body mass of an adult.
- Preterm infants are especially susceptible to heat loss due to poor tone, ↓ fat and thinner skin than term infants.

Neutral Thermal Environment (NTE)

- The **neutral thermal environment** is the temperature range where heat production is at the minimum needed to maintain normal body temperature.

Thermoneutrality

- A state of thermal balance between an organism and its environment.

What Do We Know?

- Increased body surface area compared to weight
- More skin means more radiant heat and more insensible water loss.

Risk factors for Preterm Infants

- Less brown fat and glycogen stores.
- Decreased ability to maintain flexion.

What Do We Know?

- The majority of an infant's thermal receptors are found in the face, neck, and shoulder area.
- Stimulation of these receptors will result in chilling and calorie expenditure.

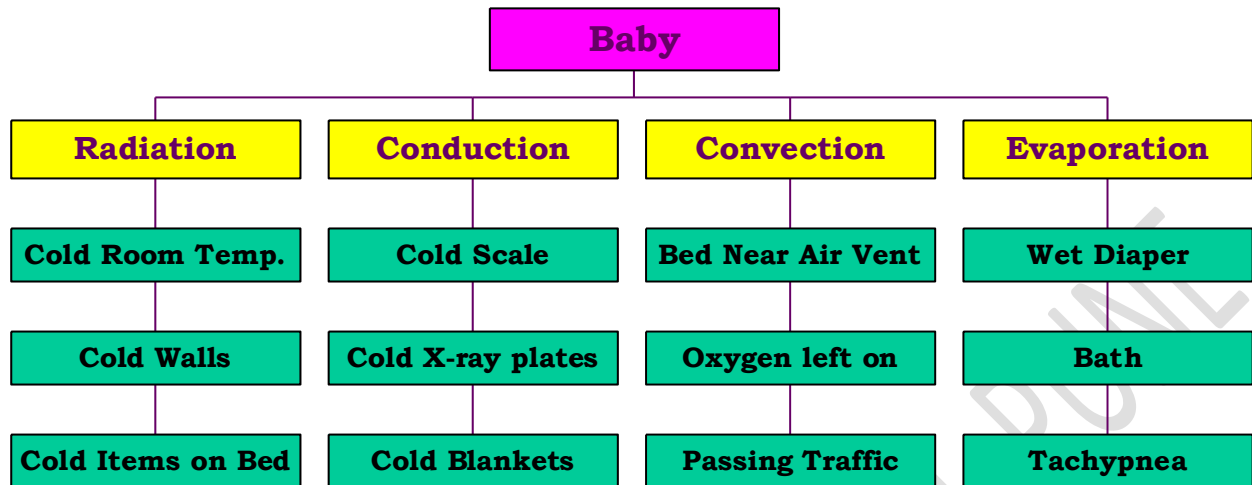
What Do We Know?

- **Shivering**, which is the main way in which older children and adults

generate heat, is impossible or

not effective in infants.

- Neonates and young infants generate heat by **burning brown fat**.



Strategies to prevent heat loss:

CONVECTIVE HEAT LOSS can be prevented by

- Providing warm ambient air temperature
- Placing infants less than 1500 grams in incubators
- Keeping portholes of the incubator closed
- Warming all inspired oxygen
- On open warmers keeping sides up and covering infant if possible
- Using Infant Servo Temperature Control

EVAPORATIVE HEAT LOSS can be prevented by:

- Keeping the neonate and his/her environment dry.
- Drying the baby immediately after delivery.
- Placing preterm or SGA infant in occlusive wrap/bag at delivery.
- Delay bath until temperature is stable.

RADIANT HEAT LOSS can be prevented by:

- Avoiding placement of incubators, warming tables and bassinets near cold windows, walls, air conditioners, etc..
- Placing a knit hat on the infant's head
- Wrapping tiny babies in "bubble" wrap
- Increase environmental temperature

CONDUCTIVE HEAT LOSS can be prevented by:

- Placing a warm diaper or blanket between the neonate and cold surfaces.

- Placing infant on pre-warmed table at time of delivery
- Warming all objects that come in contact with the neonate.
- Admitting infant to a pre-warmed bed.
- Skin to skin contact.

Interventions for at Risk Infants

- Pre-warmed radiant warmer bed
- Pre-warmed incubator
- Do not leave a warmer bed or incubator in the manual mode
- Servo mode allows the baby to control the heat output of the warmer units
- Heated water pad
- Heat lamp
- Warm and humidify inspired gases
- Occlusive wrap/bag at delivery
- Open incubator portholes and doors only when necessary
- Blanket over incubator
- Cluster care

Use of Skin Servo Monitoring

- Incubators and radiant warmers are designed to work using skin temperature to regulate the thermal environment
- As temperature is higher in brown fat areas, avoid placing the temperature probe over brown fat deposit areas, such as the axilla, neck, or back.

Safety Considerations

- Make sure the sides of radiant warmers are up, unless medically unable.
- This protects the infant from air currents in the room that might stimulate thermal receptors.

Interventions to Consider

- Cover thermoreceptor-rich areas, such as the head.
- Dry well after baths, especially the head and neck area.
- Dress and cover infants, when in cribs, to prevent them from chilling.
- Warm fluids prior to dressing changes
- Rewarm slowly to prevent a potential subsequent drop in blood pressure.

Rewarming

- Monitor Respiratory rate and effort
 - Increased distress

- Apnea
- Oxygen saturations
 - Hypoxemia / desaturations
 - Be prepared for ↑ need for respiratory support
 - Monitor acid/base status
- Blood glucose
 - Monitor- infant at increase risk for hypoglycemia

Key Points to Know in Preventing Hypothermia

- Infant most vulnerable
 - Premature and SGA infants
 - Neonates requiring prolonged resuscitation
 - Acutely ill
 - Open skin defects (abdomen, spine)
- Remember the basics
 - Warm, humidified oxygen ASAP
 - Warm objects before contact with infant
 - Pre warmed Radiant warmer/incubator – utilize servo control
 - Rewarm cautiously- Be prepared to resuscitate

Conclusions

- Hypothermia in the newborn is due more to a lack of knowledge than to lack of equipment.
- Hypothermia is a preventable condition that has well documented impact on morbidity and mortality.
- Therefore, assisting the infant to maintain a normal body temperature and preventing hypothermia during stabilization is critical

“PAIN MANAGEMENT IN NEONATE”

Lt Col Rekha Bhattacharya
Vice Principal
College of Nursing,
AFMC Pune

PAIN IS THE 5th VITAL SIGN !

Pain In Neonates

- **Acute pain** : Heel sticks , venipunctures, tracheal suctioning, lumbar puncture.
- **Prolonged / Chronic pain** : NEC, Meningitis, Mechanical ventilation, Birth trauma, Chest tubes.
- **Post-Operative pain** : Hernia repair, ligation of PDA , VP shunts, Abscess drainage etc

Development Of Pain Perception In Human Fetus

- 6 Weeks : Synapses between peripheral sensory afferents and dorsal horn neurons will appear
- 8 Weeks : 1st cutaneous sensory receptors- perioral area
- 20 Weeks : Sensory receptors present in all cutaneous and mucosal surfaces
- 20 Weeks : Thalamocortical connections will allow painful stimuli to reach the somato-sensory cortex
- Current theory of pain postulates that pain occurs at level of “thalamus”

Pain Assessment

- **Acute procedural /Post operative pain**
 - Intensity
 - PIPP(Premature Infant Pain Profile). NIPS(Neonatal Infant Pain Scale)
 - NPASS(Neonatal Pain, Agitation and Sedation Scale), FLACC score
 - CRIES Score, Character, Location and Duration cannot be measured

Prevention & Management of Pain

- Pain Control is more than a matter of comfort
- Controlling Pain decreases complications

Prevent or Minimize Pain

- Cluster blood draws or use arterial line whenever possible to minimize sticks
- Use smallest gauge needle possible
- Use minimal amounts of tape/use tape remover to remove it

- Pre medicate prior to painful or invasive procedures

Non Pharmacological Management

Environmental Intervention

- Decrease the environmental stress of the NICU.
- Reduction of light levels
 - Promote increased sleep
 - Weight gain
 - Development of
- Circadian rhythm

Swaddling & Touch

- Swaddling is the wrapping of infants in cloth to restrict their movements.

Facilitated tucking

- Side lying or supine position with flexed arms and legs close to the trunk.
- decrease mean crying time and decrease sleep state changes

Non Nutritive Sucking (NNS)

- NNS significantly decrease heart rate without stimulation , and during painful stimulation
- In VLBW infants ,Stevens et al demonstrated that NNS is effective in reducing pain caused by frequent heel lance sampling.

SUCROSE

- Blass and Hoffmeyer reported the effectiveness of sucrose as an analgesic agent for newborn infants during heel stick

Glucose

- Oral glucose is also effective in reducing pain.
- Glucose and sucrose solutions with a pacifier is synergistic
- Sweet solution and a pacifier provide a stronger analgesic effect than either one alone.

Multisensory Stimulation

- Developed by Bellieni et al It consists of:
 - Facilitated tucking
 - Looking the infant in the face close up, to attract attention.
 - Massage infants face , back.

Skin to Skin Contact

- Gray et al, found that 10- 15 min skin to skin contact between mothers and their new-borns reduces crying, grimacing, heart rate during heel lance procedure in full term.

Breastfeeding

- Breastfeeding during a painful procedure has been found to be a potent analgesic.

- Some studies show that if breastfeeding is not continued during the procedure, it has no analgesic effect.

Music Therapy

- Music defined as an intentional auditory stimulus organized elements including melody , rhythm & harmony.

Massage Therapy

- It involves hand to hand and skin to skin manipulation of the soft tissue or gliding strokes. Enhances vagal activity, modulating insulin and decrease cortisol.

Pharmacologic Analgesia

- Local analgesia
 - Lidocaine infiltration
- General analgesia
 - Non Opioid drugs
 - Midazolam
- Opioid drugs
 - Morphine
 - Fentanyl

Management of specific procedures

Heel Lancing

- Breastfeeding
- Swaddling
- Oral Sucrose
- Large sample of blood prefer venipuncture

Lumbar Puncture

- Holding the baby
- Nonnutritive sucking
- EMLA may be applied
- Pharmacologic analgesia
- Oral Sucrose

“NUTRITIONAL NEEDS OF THE NEONATE”

Dr. (MRS.) Jyoti Naikare.
Principal, Sinhgad College Of Nursing
Narhe, Pune

IMPORTANTS OF NUTRITION IN NEONATE

- Good Nutrition Promotes Babies' growth and development.
- Good Nutrition Protects Babies from Diseases.
- Good Eating Habits is Formed in Early Life
- Nutrition is extremely important in the early months of life because brain growth is proceeding at such a rapid rate during this time.
- Providing adequate food and nutrition for the newborn to achieve physiologic needs.
- The importance of feeding in terms of the maternal stimulation and love the neonate receives in the process cannot be overstated.
- The parent is close to the neonate during feeding time, and the baby will be particularly sensitive to the mother's demonstration of affection or lack of warmth.
- The neonate who does not experience during feedings a warm relationship with the mother or primary caregiver may fail to thrive as surely as the one who is denied sufficient protein or calories.

NEEDS OF THE NEONATE AFTER BIRTH

- In-Utero: Thermoregulation, Air for breathing, Nutrition, safe environment, protection from infection to certain extent, elimination Etc.

ADEQUACY OF THE NUTRITION

- 1 kg = 2.2 pounds.
- To convert kg to pounds multiply by 2.2
- neonates need minimum 120calories / kg / day to maintain weight and growth.

NUTRITIONAL ALLOWANCES FOR THE NEWBORN

- Calories
- Protein
- Fat
- Carbohydrate
- Fluid

- Minerals

CALORIES

- 120 calories per kilogram of body weight every 24 hours to provide an adequate amount of food for maintenance and allow for growth as well.
- Under feeding – Malnutrition
- Over Feed - Tendency for obesity
- The actual caloric requirement depends on the activity of the baby and the rate of growth.
- An active neonate, one who cries frequently and squirms constantly, will need more calories than one who is more passive and is content to spend long hours playing quietly or just studying the environment.
- To calculate the minimum amount of calories an neonate needs per feed.
- neonate weight in kg is multiplied by 120 calories / number of feedings per day.
- Baby weight = 2.5 kg.
- Calories needed per day = $2.5 \times 120 = 300$ calories
- Calories needed per feeding = $300 / 6$
- Calories needed per feeding = 50
- Human milk contain 67 calories / 100 ml.

PROTEIN

- The nutritional allowance of protein for the first 2 months of life is 2.2 g per kilogram of body weight. Needed for extremely rapid growth.

FAT

- Linoleic acid is an essential fatty acid necessary for growth and skin integrity in neonates.
- The nutritional allowance of fat is 30 % of caloric requirement per day.

CARBOHYDRATE

- The nutritional allowance of carbohydrate is 30 to 50% of caloric requirement per day.
- Adequate carbohydrate needed as this allows protein to be used for building new cells rather than for calories, encouraging normal water balance, and preventing abnormal metabolism of fat.

FLUID

- The fluid requirement for a newborn is 150 to 200 ml / kg per 24 hours.
- Maintaining a sufficient fluid intake in newborns is important because their metabolic rate is high and metabolism requires water.

MINERALS

- Calcium
- Calcium is an important mineral because of its contribution to bone growth.

NEONATE ALSO NEEDS

- Sodium, potassium, and magnesium, iron
- Zinc is necessary for enzyme production and activation.
- Copper, selenium, chromium, manganese and nickel
- Human milk. (exclusively breast feeding every 2 hrly for 10-15 min with right method.

PRETERM Vs. TERM NEONATES

- Neonate less than 34 weeks gestation may need tube or gavage feeds until they are able to coordinate sucking, swallowing and breathing.
- The premature neonates digestive tract is immature and frequently suffers from both motility and absorption disturbances.
- Premature neonates are particularly prone to a potentially catastrophic disease known as NEC

“Fluid and Electrolyte Balance in High Risk Neonates”

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Fluids and electrolyte balance is an important and challenging part of the management of any premature or critically ill newborn. Maintaining fluid and electrolyte in high risk neonates is to allow a successful transition from the aquatic environment of the uterus to the extra-uterine milieu in the first days of life and to replace the losses of water and electrolyte so as to maintain normal balance of these essential substance.

The important fluid electrolyte management are :

- Many babies in NICU need IV fluids
- They all don’t need the same IV fluids (either in quantity or composition)
- If wrong fluids are given, NB kidneys are not well equipped to handle them
- Serious morbidity can result from fluid and electrolyte imbalance

Principles fluid electrolyte management

- Total body water (TBW) = Intracellular fluid (ICF) + Extracellular fluid (ECF)
- Extracellular fluid (ECF) = Intravascular fluid (in vessels : plasma, lymph - IVF) + Interstitial fluid (between cells- IF)

Management of fluid and electrolyte

Management of F&E - D1 Term

- **Req.= Urine + IWL – Wt loss**
- On IV fluids → solute load 15mOsm/Kg
- With urine osmolality 300, urine=50ml/Kg
- IWL = 20ml/kg
- Wt loss = 10gm/Kg
- **Req.= 50 + 20 – 10 = 60ml/Kg**
- PT → more IWL

Fluid and electrolyte related common neonatal conditions

- **Resp. Distress Syndrome:** Adequate but not too much fluid. Excess leads to hyponatremia, risk of BPD. Too little leads to hypernatremia, dehydration
- **Bronchopulmonary Dysplasia:** Need more calories but fluids are usually restricted: hence the need for “rocket fuel”. If diuretics are used, watch for electrolyte problems. May need extra calcium.

- **PDA:** Avoid fluid overload. Keep at 120ml/Kg. If indomethacin is used, monitor urine output.
- **Asphyxia:** May have renal injury or (SIADH)syndrome of inappropriate diuretic hormone. Restrict fluids initially, avoid potassium. May need fluid challenge if cause of oliguria is not clear.
- **NEC:** Need more fluids. May go into shock. Give 200ml/Kg
- **ARF :** Give 400ml/sq m/D + urine output

Common Electrolyte problems:

- Sodium:
 - Hypo (<130 mEq/L; worry if <125)
 - Hyper (>150 mEq/L; worry if >150)
- Potassium:
 - Hypo (<3.5 mEq/L; worry if <3.0)
 - Hyper > 6 mEq/L (non-hemolyzed)(worry if >6.5 or if ECG changes)
- Calcium:
 - Hypo (total<7 mg/dL; ion<4)
 - Hyper (total>11; ion>5)

Common Fluid Problems:

- **Oliguria :** UOP< 1cc/kg/hr. Pre-renal, Renal, or Post-renal causes. Most normal term babies pee by 24-48 hrs. Don't wait that long in sick little babies! Check Baby's urine. Try fluid challenge, then lasix. Get USG if no response.
- **Dehydration:** Wt. loss, oliguria \pm , urine sp. gravity >1.012. Correct deficits, then maintenance + ongoing losses
- **Fluid overload:** Wt. gain, often hyponatremia. Fluid+ sodium restriction

“Birth Asphyxia”

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Birth asphyxia is a leading cause of neonatal mortality & morbidity. It is also important cause of developmental delay & Neurological problems both term & preterm new-born. Approximately 5 to 10% neonates experience asphyxia at birth.

What is Birth Asphyxia?

Asphyxia means lack of oxygen and blood flow to the brain. Birth asphyxia happens when a baby's brain and other organs do not get enough oxygen and nutrients before, during or right after birth. This can happen without anyone knowing. Without oxygen and nutrients, cells cannot work properly. Waste products (acids) build up in the cells and cause damage.

Birth asphyxia is the medical condition resulting from deprivation of oxygen to a new-born infant that causes physical harm, mainly to the brain.

- Birth Asphyxia = Perinatal Asphyxia = Neonatal Asphyxia.
- Incidence: 1 – 6 /1000 live births.

APGAR Score Assessment:

7-10: no or mild depression

4-6: moderate depression

0-3: severe asphyxia

Perinatal/ Birth Asphyxia: Perinatal Asphyxia is the leading cause of neonatal death (along with infection, prematurity and LBW).

It is the leading cause of neurodevelopmental disability in children.

Management of a neonate with Birth asphyxia:

NICU care

1. Maintain normal temperature

- Avoid Hyperthermia

2. Maintain normal oxygenation and ventilation

- Maintain saturations between 90% and 95% and avoid any hypoxia or hyperoxia
- Avoid hypocarbia, as this would reduce the cerebral perfusion

▫ Avoid hypercarbia, which can increase intracranial pressure and predispose the baby to intracranial bleed.

3. Maintain normal tissue perfusion

- Start intravenous fluid
- Administer dobutamine (preferred) or dopamine to maintain adequate cardiac output, as required.
- Do not restrict fluid as this practice may predispose the babies to hypo perfusion.
- Restrict fluid only if there is hyponatremia (Sodium < 120 mg%) secondary to syndrome of inappropriate secretion of ADH (SIADH) or if there is renal failure.

4. Maintain normal hematocrit and metabolic milieu

- Maintain blood glucose levels between 75 mg/dL and 100 mg/dl.
- Correct Anaemia and maintain haematocrit between 45% and 55%.
- Check blood gases to detect metabolic acidosis as needed and maintain pH above 7.30.
- In case of severe asphyxia, provide calcium in a maintenance dose of 4 mL/kg/day (of 10% calcium gluconate)

Management of a neonate with perinatal asphyxia:

NICU care

- ☐ Treat seizures
- ☐ Nutrition:
- ☐ Start oral feeding once baby is hemodynamically stable
- ☐ Miscellaneous
- ☐ Administer Vitamin K (1 mg IM) to all infants with perinatal asphyxia

“Neonatal Jaundice”

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Introduction:

- ❑ Jaundice - Yellow coloration of skin, conjunctiva and mucosa
- ❑ Hyperbilirubinemia – elevated serum bilirubin levels.

What is jaundice?

- Jaundice is bilirubin that is deposited in the skin and mucous membranes. It is the end product of haem breakdown.
- Lysis of red blood cells releases haem from haemoglobin, haem is then converted to bilirubin and excreted.

Neonatal Jaundice (hyperbilirubinemia):

Definition: Hyperbilirubinemia refers to an excessive level of accumulated bilirubin in the blood and is characterized by jaundice, a yellowish discoloration of the skin, sclerae, mucous membranes and nails.

- Unconjugated bilirubin = Indirect bilirubin.
- Conjugated bilirubin = Direct bilirubin.
- Normally s. bilirubin level vary between 0.3 -1.2 mg/dl.
- Jaundice becomes evident when the serum bilirubin levels rise above 2.0 to 2.5mg/dl
- Levels as high as 30 to 40mg/dl can occur with severe disease

Types of Neonatal Jaundice:

- Physiological jaundice – occurs between 36 to 72 hours of age in term babies and earlier in preterms but not before 24 hours of birth. Serum bilirubin does not exceed 15 mg/dl
- Pathological jaundice occurs within 24 hours of life, may appear after 72 hours but may remain even after 7 days of life.

Best classified by age of onset and duration:

1. **Early:** within 24 hrs of life
2. **Intermediate:** 2 days to 2 weeks
3. **Late:** persists for >2 weeks

- **Prolonged Jaundice** persisting after 14 days in the term infants or after 21 days in the preterm infant (jaundice of prematurity)
- **Other types of Jaundice: Breastfeeding jaundice:** Jaundice can occur when a breastfeeding baby is not getting enough breast milk because of difficulty with breastfeeding or because the mother's milk isn't in yet.
- **Breast milk Jaundice:** In 1% to 2% of breastfed babies, jaundice may be caused by substances produced in their mother's breast milk that can cause the bilirubin level to rise. These can prevent the excretion of bilirubin through the intestines. It starts after the first 3 to 5 days and slowly improves over 3 to 12 weeks.
- **Blood group incompatibility-** Rh or ABO Problem.

Bilirubin exists in two main forms in serum

1. **Unconjugated** bilirubin reversibly bound to albumin
2. **Conjugated** bilirubin readily excretable via the renal and biliary systems

Common Risk Factors of Infant Jaundice:

- Premature birth - premature babies have severely underdeveloped livers and fewer bowel movements, so there is a slower filtering and infrequent excretion of bilirubin.
- Breast-feeding - babies who do not get enough nutrients or calories from breast milk or become dehydrated are more likely to develop jaundice.
- Rhesus or ABO incompatibility- when a mother and baby have different blood types, the mother's antibodies go through the placenta and attack the red blood cells of the fetus, causing accelerated break down.
- Bruising during birth - this can make red blood cells break down faster, resulting in higher levels of bilirubin.

Treatment of neonatal jaundice:

Phototherapy:

- SSPT, DSPT Phototherapy
- LED PHOTOTHERAPY

Mechanism:

- Phototherapy lights promotes bilirubin excretion by photoisomerization, which alters the structure of bilirubin to soluble form (lumirubin) for easier excretion from the body.
- Goal is to decrease TSB by 4-5 mg/dL or < 15 mg/dL.
- Best results occur within first 24 to 48 hours of treatment.

Care of baby in phototherapy:

- Distance – 45cms
- Eye shield, cover genitals
- Continue feeding – Breast/ IV Fluids
- Ongoing monitoring of: adequacy of hydration (urine output) and nutrition(weight gain)
- Maintain Body temperature
- Adequate exposure to light - change position 2 hourly
- Clinical improvement in jaundice
- TSB or SBR levels
- Keep watch for potential signs of bilirubin encephalopathy
- Phototherapy to be discontinued when serum bilirubin comes down to 10mg/dl for 2 times

Phototherapy- potential complications:

- Overheating – hyperthermia
- Excessive overheating- frying effect
- Water loss – dehydration
- Diarrhoea from intestinal hypermotility,
- Anal excoriation.
- Ileus (preterm infants)
- Transient skin rash
- Increased metabolic rate
- Disturbed electrolyte balance, hypoglycemia, hypocalcemia.
- Temporary lactose intolerance.

Phototherapy- long term complications:

- Retinal damage
- Prapism
- ‘Bronzing’ of neonates with conjugated hyperbilirubinaemia

BILIBLANKET PHOTOTHERAPY:

- An alternative to traditional phototherapy, “bililights” is a fiberoptic blanket.
- It consists of light generating illuminator, a bundle of plastic fibres affixed to a panel that distributes the energy and a soft disposable light permeable cover to protect the infant.
- The blanket delivers therapeutic light consistently and continuously to the infant and achieves the same photoisomerization as conventional phototherapy.
- light pad size 25cm x13cm (10"x5")
- Excludes the use of eye pads.

Nursing considerations:

Assessment:

- All newborns should be examined for jaundice at least every 8 to 12 hours for the first day of life.
- observing for evidence of jaundice at regular intervals.
- Practice blanching
- Use kramers chart
- Blood for investigations – B levels
- Ascertain birth weight, gestation and postnatal age
- Decide whether jaundice is physiological or pathological

Nursing goals:

- Infant will receive appropriate prescribed therapy
- Infant will experience no complications from therapy.
- Practice rooming-in as much as possible.
- Family centered care –
 - ✓ Family will receive emotional support.
 - ✓ Family will be prepared for home phototherapy (if prescribed).
 - ✓ Appropriate Education at discharge

Conclusion:

- Hyperbilirubinemia is a common and potential serious issue in neonates
- Important to recognize and diagnose early in order to initiate prompt treatment as early possible SPECIALLY NON-INVASIVE THERAPIES.

PANEL DISCUSSION

The panel discussion started well before the time planned at 03:10pm on “INFECTION CONTROL IN NICU” which is a very important topic for all the paediatric nurses and students participated. New-born babies, especially premature infants, are more susceptible to infection. Babies in neonatal intensive care unit (NICU) often have immature immune systems. They are exposed to many different caregivers and may have multiple blood tests, IV lines, and other invasive procedures. This care is needed for babies to grow and thrive, but it also places them at risk for infection.

- Discussion opened up with the introduction by Mrs. Jaya John, Moderator of panel discussion
- Lt. Col.V.Radha Mam started with significance and importance of Infection Control in NICU by sharing the statistics of the same.
- Mr.Johnson Varghese discussed the infection control protocol in NICU which should be followed strictly.
- Mrs. Vinaya S. elaborated regarding the infrastructure of NICU to control infection and microplanning based on the same. Policies and standards was also discussed thoroughly by mam and others also shared their ideas regarding the same.
- Mrs. Bhavana M.Kale demonstrated handwashing and all the group participation was done with return demonstration.
- Mrs.Vaishali, NICU incharge discussed regarding policies followed by Bharati Hospital and teamwork done and all the team of NICU needed.
- Mrs. Arti also involved herself in discussion regarding equipments used in the NICU.
- Mr. Shivsharan discussed regarding the procedures done in NICU and how to prevent infection from the same.

All the participants were really active and interactive. They shared very small practical things involved in NICU involving cleaning of Radiant warmer, and multiple strategies to control infection in NICU.

VALEDICTORY & CONCLUSION

Valedictory session started by 04.30pm timely as per schedule. It started with the responses of three respected delegates i.e. Ms. Lemkey (M.Sc 2nd year nursing), Mr. Vaibhav (Assistant Professor, Pravara Hospital,CON), and Mrs. Bhavana M. Kale (NICU Incharge, Sasoon Hospital) which was very good. They all appreciated the organisation, time-management and all the other management of the conference. They were kind enough to thank all the authorities involved for arrangement of conference. They really appreciated and felt thankful for conference as it was having very interactive sessions specially in Panel discussion. It was really amazing to hear from all the respected delegates regarding the success of the conference.

The conference was completed successfully accordingly as planned with the contribution of various committees. The sessions were so interesting and delivered effectively by the resource persons. It was indeed a great learning experience of important topics of clinical importance and neonatal care. The feedbacks from the delegates were also positive. These conference paved a new pathway for the upcoming future conferences The committees coordinate each other and helped one another to reach at this level. And indeed it was a successful one to some extent. The delegates were interactive and active throughout the sessions. Lastly but not the least, this enriching conference was ended with the positive feedbacks from the delegates.

THIS CONFERENCE PAVED A NEW PATHWAY FOR THE UPCOMING FUTURE CONFERENCES.

Committee members



Inaugural Session





















Panel discussion





Validictory session



Feedback taken from the delegates

