HUYE CHAPTER
Email: rmsa.health@gmail.com
Tel:0785782805

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ABSTRACT TO 6TH WORLD CONFERENCE ON MIDWIFERY AND NEONATAL CARE

TRACK 7: **Pain management in newborns**

Pain is a distressing feeling often caused by intense or damaging stimuli. according to the international association for the pain study define pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. They are 3 largely accepted pain types which are **Nociceptive pain**, **nociceptive inflammatory pain** and **Neuropathic pain.**

Newborn usually refers to a baby from birth to about from birth to about 2 months of age. Infants can be considered children anywhere from birth to 1-year-old.

The effective ways of pain management are a desirable standard of care for preterm and term newborns and may potentially improve their clinical and neurodevelopmental outcomes. Neonatal pain should be assessed routinely using context-specific validated and objective pain methods despite the limitations of currently available available tools.

In pain management we can use **Pharmacological, behavioral or environmental measures/ approaches** can be used to manage neonatal pain by non-pharmacological approaches include **Kangaroo care**, **non-nutritive sucking**, **facilitated tucking, sucrose and other sweeteners, massage and acupuncture therapy.**

Anesthesia therapy, also can be used in pain management. **Local and topical** anesthetics can reduce acute pain caused by skin-breaking or mucosa-injuring procedures.

Opioids from the main stay for treatment of severe pain like Morphine and Fentanyl are the most commonly used drug.

Non-opioid drugs include varies sedatives and anesthetic agents, mostly used as adjunctive therapy in ventilated neonates. Acetaminophen, ibuprofen and other drugs are used for neonates in neonatal in neonatal Intensive care unit (NICU) are much summarized, together with practical protocols for procedural, postoperative, and mechanical stress.

Importance of Neonatal Pain

The American Academy of Pediatrics and the Canadian Pediatric Society (AAP/CPS) updated their guidelines in 200616, recommending that each health care facility treating newborns should establish a neonatal pain control program that includes:

- Performing routine assessments to detect neonatal pain
- Reducing the number of painful procedures
- Preventing or treating acute pain from bedside invasive procedures
- Anticipating and treating postoperative pain after surgical procedures
- Avoiding prolonged or repetitive pain/stress during NICU care.

Pain assessment methods

Currently available methods for neonatal pain assessment may be unidimensional (one parameter) or multidimensional (physiologic, behavioral, or other parameters). Several multidimensional assessment tools with demonstrated validity, reliability, and clinical utility are used in the NICU. These tools are based on indicators readily assessed at the bedside, such as changes in **heart rate**, **respiratory pattern**, **blood pressure**, or **oxygen saturation**. **Behavioral responses** include crying, changes in facial expressions and body movements. For example, total facial activity and cluster of specific facial findings (brow bulge, eye squeeze, nasolabial furrow, open mouth) were associated with acute and postoperative pain.

Pain reduction application

- Decrease bedside disruptions by timing routine medical interventions (daily physical examinations) with other care procedures (diaper change or suctioning).
- Anticipate laboratory testing to minimize the frequency of blood sampling.
- Use hand-held devices that can perform several analyses (pH, PaO2, PaCO2, electrolytes, calcium, bilirubin, lactate) from a single small blood sample, thereby reducing the number of heelsticks required for laboratory testing.
- Place peripheral arterial or central venous catheters in patients who need more than 3-4 heelsticks per day. These procedures should be performed with adequate analgesia.
- If clinically appropriate, use noninvasive monitoring such as transcutaneous PaO2, PaCO2, SpO2, glucose or bilirubin levels, or near infra-red spectroscopy (NIRS) to avoid the need for blood sampling.
- Consider the use of noninvasive therapeutic approaches for providing analgesia in newborns (e.g. transdermal patches, iontophoresis, compressed air injectors).

Kangaroo Care and facilitated tucking

Kangaroo care (KC) is defined as skin-to-skin contact, most commonly instituted shortly after birth. KC has been used in developing countries for warmth and bonding, while decreasing morbidity and mortality, especially in preterm neonates. In developed countries, many health care workers are unaware of benefits of KC. During heel sticks, KC decreases crying time, improves pain scores and decreases stress in preterm neonates, similar to facilitated tucking. The

mechanism of action of KC is unclear. Possibilities include the ability of the newborn to hear the maternal heartbeat, less maternal stress, and enhanced self-regulation.

Non-nutritive sucking, sucrose and other sweeteners

Pain relief has been provided by non-nutritive sucking, with and without sucrose, glucose and breast feeding. Non-nutritive sucking and sweeteners appear to work by increasing endogenous endorphins, as naloxone appears to blunt the response; however, the mechanism is not completely understood. Sweeteners appear to augment the anti-nociceptive response to pain compared to non-nutritive sucking. Both sucrose and glucose enhance its effectiveness, they both decrease crying time and improve pain scores after acute mild pain such as from heelsticks. A recent meta-analysis revealed that glucose is an acceptable alternative to sucrose, decreasing PIPP scores and crying times associated with venipuncture and heel lance. Sucrose is efficacious in reducing the pain from single events such as retinopathy of prematurity screening, oral gastric tube insertion and heel lance

Massage therapy

Massage therapy involves hands-on and skin-to-skin manipulation of the soft tissue that includes gentle effleurage (rhythmic, gliding strokes confirming to the contours of the body), light petrissage (lifting, rolling, kneading strokes done slowly) and compression (light compression of selected areas) and nerve stroke (very light brushing of the skin). It is thought to work by enhancing vagal activity, modulating insulin, and insulin like growth factor 1 as well as decrease levels of cortisol and epinephrine. Massage therapy has demonstrated effectiveness in randomized trials

Acupuncture

Acupuncture is the stimulation of acupuncture points by mechanical or electrical means to elicit pain relief. It works by stimulation of the endorphin system. Despite its use in China for thousands of years and its frequent use by patients in developed countries, it has not gained widespread acceptance in conventional Western medicine

In conclusion, non-pharmacologic therapies are safe and effective for minor pain and as an adjunct for moderate or severe pain. KC is effective for pain relief during the holding period, it is safe in clinically stable term and preterm neonates weighing more than 1000 grams, and has beneficial effects on growth, mother-infant bonding and long-term neurodevelopmental outcomes. Facilitated tucking can provide some pain relief for endotracheal suctioning but is not as effective as sucrose for repeated skin-breaking procedures

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Hubert Twizere

He is a university of Rwanda student, third year student midwife and president of Rwanda midwifery student's association (RMSA) and he is much interested in maternal and neonatal care.