



“Analgesia for Non-Ritual Circumcision in Healthy Newborns”

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INTRODUCTION:

Of approximately 4 million deliveries in the United States, 1.2 million newborn males (or approximately 60%) are circumcised annually. Neonatal circumcision is the most common surgical procedure on males in the United States. A national survey of pediatric, family practice, and obstetrics and gynecology residency program directors determined that training with regard to pain relief for circumcision is clearly inadequate.

Recently (1999), the American Academy of Pediatrics announced that analgesia and local anesthesia are safe and effective in reducing procedural pain associated with circumcision. Therefore, if a decision for circumcision is made, procedural analgesia should be provided. The following steps are commonly involved in non-ritual circumcision: Cleaning of the genital area, dilatation of preputial orifice and visualizing the glans, freeing the inner preputial epithelium from the epithelium of the glans, estimating the amount of foreskin to be removed, placing the device, and incision of the foreskin.

PHYSIOLOGIC AND STRESS RESPONSES TO CIRCUMCISION:

Numerous studies showed that circumcision has significant physiologic impact on newborns, mainly due pain. Heart rate, respiratory rate and blood pressure increase, and oxygen saturation decreases, during and shortly after circumcision. Unanesthetized full-term infants had 50% more crying during circumcision, in comparison to anesthetized infants with dorsal penile nerve block. The Brazelton neonatal assessment scale showed that one day following circumcision the following behavioral changes occur: Full-term unanesthetized infants remained less attentive to stimuli such as rattle noise and face showing, had less smoothness and maturity of motor behavior, and had less ability to quiet themselves when disturbed, compared to full-term infants anesthetized by DPNB. Circumcision increases distress and cortisol response. Other pain provoking procedures in newborns such as heel lancing and venipunctures caused palmar sweating and increase in plasma renin activity. Circumcision status was associated with increased infant pain response and longer crying bouts to routine vaccination at 4-6 months of age in comparison to uncircumcised newborns. Therefore, it was postulated that circumcision without analgesia may have an adverse long-term effect on pain responses.

PAIN RELIEF MEASURES:

As a result of American Academy of Pediatrics recommendations and the numerous studies that show the undesired impact of circumcision-pain on newborn infants, the Neonatal Division at CSMC came up with pain relief guidelines for non-ritual circumcision.

The following pain relief measures were recommended:

1. Comfortable, padded, and physiologic restraint: Using a comfortable, padded restraint chair, physiologically adapted to newborns, decreases neonatal distress measured by Brazelton behavioral distress scale. Newborns have inherently relative hypertonicity due to their immature unmyelinated long tracks, therefore, more physiologic restraint is helpful.

2. Non-nutritive pacifier sucking: Showed 35% reduction in crying during circumcision.
3. Sucking sucrose solution: Offering newborns a nipple dipped in a 24% sucrose solution to suck during circumcision reduced the time of crying during the procedure to > 50%, in comparison to the controlled group who sucked on plain water. It is postulated that sucrose stimulates the opioid pathway in the brain by its sweet taste and therefore causes an analgesic effect.
4. Acetaminophen (Tylenol): Tylenol improved the comfort score 6 hrs after circumcision in neonates who received the medication 2 hrs prior to circumcision and then again 4 hrs after the circumcision. The dose of infant tylenol drops is 15 mg/kg per dose (0.15 ml/kg per dose), 2 hrs prior to and 4 hrs after the circumcision.
5. EMLA (Eutectic Mixture of Local Anesthetics): Contains 2.5% lidocaine and 2.5% prilocaine. Prilocaine has onset and duration of action longer than lidocaine. EMLA cream in the amount of 1-2 g applied to the distal half of the penis 60-90 minutes prior to the procedure decreases the crying time and the rate of increase in heart rate, compared to placebo group.
6. DPNB (Dorsal Penile Nerve Block): This type of local anesthesia decreases crying and heart rate by 50% each, causes smaller decreases in oxygen saturation, and attenuates the distress and cortisol responses, in comparison to the control group. Side effects are very rare, no complications related to DPNB were reported in one series of 887 newborns studied.
7. Subcutaneous ring block at midshaft level or subcutaneous block at coronal level: This type of local anesthesia is the most effective.

Outcome measures as an increase in heart rate and cry, were compared between newborns receiving EMLA, DPNB and subcutaneous ring block (SRB) for circumcision. The SRB was effective through all stages of circumcision, whereas the DPNB and EMLA were not effective during foreskin separation and incision (but EMLA and DPNB were still more effective than the placebo group). Subcutaneous anesthesia at the level of the corona in newborns demonstrated smaller increases in heart rate, crying and cortisol response, and smaller decrease in oxygen saturation in comparison to infants receiving DPNB. No complications were reported of subcutaneous nerve block.

In the last decades much has been learned about circumcision and pain responses in newborns. Therefore, we are pleased to be able to manage our babies in ways to minimize the pain they experience.

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