“ASSESSMENT AND MANAGEMENT OF POSTOPERATIVE PAIN IN INFANTS”.

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ANNOTATION:

The most important task in pediatric care is pain management. This report presents current data on the assessment and management of pain syndrome during various invasive procedures in neonates. The main principles of pain assessment and key aspects of pain control strategies for newborns are discussed.

Keywords: pain, neonates, postoperativ pain.

It is indisputable today that newborns experience pain. They have both short-term and long-term consequences of pain, including disruptions in neurological and behavioral development. The effects of severe and repeated pain include the development of intraventricular hemorrhages, periventricular ischemia, an increased risk of metabolic acidosis, sepsis, and disseminated intravascular coagulation syndrome. The rise in the number of skin-damaging procedures in neonatal intensive care units (NICU) is associated with the presence of a thinner layer of gray matter in the cerebral cortex of children who underwent these procedures, at the age of 7. Stress associated with neonatal pain correlates with lower cognitive and motor function at the corrected age of 8-18 years and more anxious/depressive behavior from 18 months to 30 years. Effective pain control includes prevention, assessment of severity, effective analgesia, and subsequent re-evaluation of the adequacy of the intervention, determining the need for further action. In 2006, the American Academy of Pediatrics and the Canadian Pediatric

Society published a statement stating that every healthcare institution should develop a program for the control of neonatal pain, aimed at routine pain assessment, reducing the number of painful procedures, as well as minimizing and preventing acute pain from invasive procedures (procedural pain). To date, at least 37 pain assessment scales for newborns have been published. The most commonly used are: PIPP (Premature Infant Pain Profile), NIPS (Neonatal Infant Pain Scale), NFCS (Neonatal Facial Coding System), N-PASS (Neonatal Pain, Agitation, and Sedation Scale), CRIES (Cry, Requires Oxygen, Increased Vital Signs, Expression, Sleeplessness), COMFORT scale, and DAN (Douleur Aiguë du Nouveau-né). The clinical use of these scales is based on their simplicity and validity for this population.

However, data from a prospective cohort study conducted in 223 neonatal intensive care units, including data from 6648 newborns, indicate that recommendations for pain prevention exist in 75% of European NICUs. Only 10% of the surveyed newborns have daily assessments of chronic pain, while acute and procedural pain assessment was carried out in 30–58% of cases. Less than half of the newborns receiving analgesia, anesthesia, or sedation had regular pain assessments. Additionally, 67% of NICU staff noted the difficulty in assessing constant pain in newborns and the importance of forming an overall impression of the child's comfort. In 2009, an Italian group of neonatal experts (Lago P., Garetti E., Merazzi D., et al.) developed guidelines to assist clinicians in managing procedural pain experienced by patients in neonatal intensive care units (NICUs) [3].

Pain management in newborns is not limited to pharmacological interventions. Pain control strategies can vary [4]:

Exogenous (environmental changes): a) Minimizing the number of painful procedures;

b) Reducing noise and lighting; c) Maintaining a calm environment during the

procedure;

d) Clustering procedures. *Physical (non-pharmacological interventions):* a) Kangaroo care (holding the infant on the mother's chest); b) Non-nutritive sucking (NNS); c) Breastfeeding; d) 24% sucrose solution. *Pharmacological analgesia:* a) Lidocaine-prilocaine cream; b) Paracetamol; c) Opioids; d) Regional and general anesthesia. *Psychological interventions:* a) Distraction during the procedure; b) Tactile stimulation, positioning.

General principles for controlling procedural pain in newborns include the following requirements:

- During each procedure, exogenous, behavioral, and non-pharmacological comfort measures should be used. Pharmacological interventions, when combined with these measures, can have an additive or synergistic effect in controlling procedural pain and stress.
- Before planned procedures (such as blood draws or establishing venous access), it is important to achieve an optimal state of quiet alertness. If possible, sleep should not be interrupted, and the procedure should be scheduled away from feeding times and other painful invasive procedures.
- The procedure should be performed in a calm and relaxing environment, minimizing additional stimuli (light and noise). During the procedure, the newborn should be wrapped in warm blankets.
- Monitoring pain and stress during ongoing analgesia or invasive procedures using neonatal pain scales can facilitate titration of analgesics and improve understanding of how the newborn is feeling.
- After the procedure, physiological parameters should continue to be monitored until they return to baseline. No other invasive procedures should be planned for at least 2 hours following the procedure.

Thus, pain assessment still relies on proven multimodal, yet subjective, pain assessment tools. The development of more modern equipment for quantitative

pain assessment includes the use of parameters such as heart rate dynamics, blood pressure, non-invasive infrared spectroscopy, amplitude-integrated electroencephalography, skin conductance measurement, and others.

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