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PAIN MANAGEMENT IN NEWBORNS

YENİDOĞANLARDA AĞRI YÖNETİMİ

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ABSTRACT

There was a widespread misconception that newborns cannot feel or remember pain since their nervous systems are underdeveloped. However, a good deal of research has shown that newborns feel and remember the pain. The presence of pain is known as a major stress factor for newborns. The pain experienced by newborns negatively influences their feeding patterns, adaptation to the outside world, length of hospitalization, growth and interactions with their families. In addition to these, such experience causes physiological, behavioral and metabolic problems in newborns. The inability of newborns to verbally express their pain is one of the most important problems encountered in pain evaluation, and it imposes an important role on health professionals in pain assessment. In the evaluation of pain, pain scales appropriate for the development of the newborn should be used. The correct evaluation of the scale used in the assessment of pain by health professionals is essential. The aim of pain control is to reduce painful interventions, control the pain as early as possible and prevent the newborn from being exposed to chronic pain. Pharmacological and non-pharmacological methods are used in the pain management of newborns. The American Academy of Pediatrics (AAP) guidelines recommend the use of non-pharmacological methods to reduce pain from invasive procedures in newborns. Research has revealed that being cost-effective and easy-to-apply are the main reasons for nurses' preference for non-pharmacological methods. Additionally, their effectiveness increases when non-pharmacological methods are used together. It is recommended to expand the application of non-pharmacological methods, create standard pain assessment tools for nurses, and establish evidence-based guidelines for their use in pain management.

Keywords: Newborn, Pain management, Pharmacological and non-pharmacological methods.

ÖZET

Yenidoğanların sinir sistemleri gelişmediği için ağrıyı hissetmedikleri veya hatırlamadıkları konusunda yaygın bir yanlış kanı bulunmaktadır. Ancak yapılan çalışmalarla yenidoğanların ağrıyı algıladıkları ve hatırladıkları ortaya çıkmıştır. Ağrı varlığının yenidoğan için önemli bir stres faktörü olduğu bilinmektedir. Bebeklerin yaşadığı ağrı beslenme düzenlerinin bozulmasına, dış dünyaya uyumlarının azalmasına, hastanede yatış sürelerinin uzamasına neden olmaktadır. Ayrıca deneyimlenen ağrı yenidoğanların büyümelerinin ve aileleri ile etkileşimlerinin olumsuz yönde etkilenmesine ve fizyolojik, davranışsal ve metabolik sorunlar yaşamasına neden olmaktadır. Yenidoğanların ağrılarını sözel olarak ifade edememeleri ise ağrı değerlendirilmesinde karşılaşılan en önemli sorunlardan biri olup ağrı değerlendirilmesinde sağlık profesyonellerine önemli roller yüklemektedir. Ağrı değerlendirilmesinde yenidoğanın gelişimine uygun ağrı ölçeklerinin kullanılması gerekmektedir. Kullanılan ölçeğin sağlık profesyonelleri tarafından doğru şekilde değerlendirilmesi de önemli bir rol oynamaktadır.

Ağrı kontrolündeki amaç ağrılı girişimlerin azaltılması ve mümkün olan en kısa sürede ağrının kontrol altına alınması ve yenidoğanın kronik ağrıya maruz kalmasını engellemektir. Yenidoğanlarda ağrının kontrolünde farmakolojik ve farmakolojik olmayan yöntemler kullanılmaktadır. Yenidoğanlarda invaziv girişimlerden kaynaklanan ağrıyı azaltmak için Amerikan Pediatri Akademisi (AAP) kılavuzları farmakolojik olmayan yöntemlerin kullanılmasını önermektedir. Yapılan çalışmalarda farmakolojik olmayan yöntemlerin birlikte kullanıldığında etkinliğinin arttığı, ucuz ve uygulanması kolay olduğu için hemşireler tarafından tercih edildiği ortaya çıkmıştır. Bu nedenle bu çalışmada farmakolojik olmayan yöntemlerin uygulanmasının yaygınlaştırılması ve hemşireler için standart ağrı değerlendirme araçlarının oluşturulması, ağrı yönetiminde kullanılması için kanıta dayalı rehberlerin oluşturulması önerilmektedir.

Anahtar Kelimeler: Ağrı yönetimi, Farmakolojik ve farmakolojik olmayan yöntemler, Yenidoğan.

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INTRODUCTION

According to the International Pain Research Taxonomy Committee, pain is defined as "an unpleasant sensory sensation related to a person's past experiences, whether or not due to tissue damage from a particular area of the body" (Aliefendioğlu-Güzoğlu, 2015). Until the early 1980s, it has been considered that newborn babies cannot feel pain in invasive procedures (Marchant, 2014). Similarly, until that time, only the Liverpool method has been used to provide muscle paralysis in surgical interventions. In 1987, Anand and Hickey (1987) claimed that the physiological and hormonal response of newborn babies to pain is similar to or higher than adults. In the same year, The American Academy of Pediatrics (AAP) and the American Association of Anesthesiologists (ASA) decided that it is safe and necessary to use anesthesia for newborns during operations and painkillers postoperatively. Since the 2000s, studies on the monitoring and evaluation of the symptoms of pain have gained importance. Since then, there is ongoing research on reducing the pain experienced by newborns, the necessity of interventions applied to newborns, reducing chronic pain, side effects of uncontrolled pain, and education of family and medical personnel. These findings have begun to take place in the guides.

Effects of Pain on the Newborns

From birth, newborns are exposed to several painful interventions such as vaccination and blood collection from the heel. For babies hospitalized in intensive care units, the rate of exposure to painful procedures is quite high (Anand, 2001; Derebent-Yiğit, 2006). Some of the invasive and non-invasive procedures applied to newborns followed up in intensive care units after surgical procedures are peripheral venous, central venous or arterial catheterization, chest tube insertion and removal, urinary catheter insertion, tracheal intubation, endotracheal aspiration and dressing change (Yiğit et al., 2018).

The presence of pain is a major stress factor for the newborn. The pain experienced by the babies negatively affects their feeding pattern, adaptation to the outside world, growth, and interaction with their family, and causes physiological, behavioral and metabolic problems in newborns.

The physiological change includes changes in heart rate, blood pressure, respiratory rate, carbon dioxide and oxygen levels (Akcan-Polat, 2017). Behavioral changes include various behavioral changes such as crying and facial expressions (Melo et al., 2014). Metabolic changes include an increase in catecholamine (epinephrine, norepinephrine), cortisol, growth hormone, glucagon, aldosterone release, and a decrease in insulin release (Halimaa et al., 2001; Herrington, 2017).

Factors Affecting Pain in Newborns

There are several factors that affect the experienced pain in newborns. These are gestational age, maturity of the central nervous system, coping ability, gender, mode of delivery, type and duration of painful stimuli, environmental and general health status, the severity of the disease, past experiences, and individual differences (Walden, 2014; Yiğit et al., 2018).

Assessment of Pain in the Newborns

The inability of newborns to verbally express their pain is an important problem encountered in the assessment of pain. The aim of neonatal pain assessment should be to determine the pain in the earliest period, to try to control the newborn's pain with appropriate pharmacological and non-pharmacological methods, and to minimize the felt pain (Özyazıcıoğlu-Çelebioğlu, 2008; Yiğit, et al., 2016).

The pain of newborns should be measured with structured pain scales suitable for the gestational week of newborns, in which healthcare professionals are trained in application and interpretation (APA, 2006).

Pain assessment tools that are frequently used in the neonatal period are as follows;

Neonatal Postoperative Pain Scale: The scale developed by Krechel and Bildner (1995) aims to measure physiological pain responses in the postoperative period in preterm over 32 weeks (Krechel-Bildner, 1995).

Neonatal Infant Pain Scale: It was developed by Lawrence et al. (1993).

Premature Infant Pain Profile: It was developed by Stevens et al. (1996) to assess pain in premature infants.

Neonatal Face Coding System: It was developed by Grunau and Craig (1987).

Neonatal Pain Agitation and Sedation Scale: It was developed by Hummel et al. (2008) for preterm and term newborns.

Echelle Douleur Inconfort Nouveaune, Neonatal Pain and Discomfort Scale: EDIN: The scale developed by Debillion et al. (2001) assesses chronic pain in newborns between 25-36 gestational ages. Bernese Pain Scale for Neonates: BPNS: It is a scale that evaluates acute pain in term and preterm newborns. Its validity and reliability were done by Cignacco et al. (2004).

ALPS- Neo Pain and Stress Assessment Scale: It was developed by Lundqvist et al. (2014).

COMFORT Neo Scale: The scale developed by Ambuel et al. (1992) was revised by Van Dijk et al. (2009).

Control of Pain in the Newborns

Considering the permanent negative consequences of pain, pain treatment is crucial. Pain management in newborns is done by pharmacological and non-pharmacological methods. The aim of pain management is to reduce or eliminate painful stimuli rather than treatment.

- Pharmacological Control of Pain in the Newborns

Alternative pharmacological methods are used in line with the type of intervention to be applied in the management of pain in newborns. These methods are topical anesthetics-lidocaine, opiates-morphine and fentanyl, while benzodiazepines and midazolam are used in non-opiate treatments (Hall, 2012).

- Non-Pharmacological Control of Pain in the Newborns

Facilitated Tucking: Babies take a flexion position when they encounter stress. The position of babies in the mother's womb is the physiological flexion position. This flexion position is called facilitated tucking (Cırık-Efe, 2020).

Research has shown that the group given the facilitated tucking had a lower average pain score than the control group (Axelin et al., 2006; Lopez et al., 2015).

Reducing Environmental Stimuli: Bright lights, noise etc. stimuli to the newborn overstimulation why could it be. Therefore, environmental stimuli reduction will help the baby to calm down and therefore causes pain relief (Derebent-Yiğit, 2006).

Non-nutritive breastfeeding: Non-nutritive sucking is an approach to support and strengthen sucking ability, usually done without feeding, through a pacifier (Özlü et al., 2017).

Breastfeeding or breast milk: Tryptophan in breast milk reduces pain by increasing the release of betaendorphins (Yavuz-Alpar, 2018). Breastfeeding is easily accessible, natural, practical, and risk-free compared to other analgesic methods (Harrison et al., 2016).

Oral Sucrose: Sucrose has been found to be effective and safe for minor procedural interventions in healthy and term infants. (Stevens et al., 2013; Tsao et al., 2008). In Stevens et al. (2010)'s systematic review of 40 studies, sucrose was found to be effective in reducing procedural pain significantly.

Massage: By massaging the baby, the tactile receptors in the skin are stimulated and the pain is localized in a small area (Derebent-Yiğit, 2006). The massage and skin stimulation mechanisms are based on Gate Control Theory (Stevens et al., 2010).

Therapeutic Touch: Therapeutic touch is regulating and balancing the patients' energy flow by using their localized energy as a tool, especially in cases where the healthcare worker cannot communicate verbally, such as newborns (Erenoğlu, 2015; Turan et al., 2010).

Music: Music therapy, which increases oxygen saturation in newborns, shortens the hospital stay in premature babies, reduces weight loss, increases daily weight gain and reduces stress behavior level, is most commonly used during heel blood collection (Eroğlu-Arslan, 2018).

White Noise: White noise is similar to the sounds that the baby hears in the womb. It masks disturbing environmental sounds as it is a humming and continuous monotonous sound. Due to these features, white noise has a calming and relaxing effect on newborns (Akça, 2014).

Heartbeat Sound: The sound that babies hear most when they are in the womb is the heart sound of their mothers. Therefore, when babies are born and hear the familiar voice in the womb, they will feel safe and comfortable (Panagıotıdıs-Lahav, 2010).

Multisensory stimulation: It includes making eye contact with the baby, speaking softly, massaging, administering oral sucrose, and using the parent's scent (Locatelli-Bellieni, 2017).

Aromatherapy: It is a form of supportive treatment applied by inhalation, compress, massage and bath of aromatic plants, which are defined as essential oils and/or plants carrying essential oil. Since oils used in aromatherapy have very strong effects and are quickly absorbed by the skin, they should be used carefully, unlike other body oils used in daily life (Şar et al., 2011).

Kangaroo care and touching: The baby is laid on the mother's or father's chest, making skin-to-skin contact. The newborn is covered with towels to prevent heat loss. Maintaining skin-to-skin contact and touch is very important for the newborn to reinforce the baby's sense of safety (Yavuz-Alpar, 2018).

Individualized developmental care: It is stated that minimal stimulation to the newborn through the regulation of the physical environment is beneficial in preventing morbidity and developmental problems in newborns (Arpacı-Altay, 2017).

The Role of the Nurse in the Prevention of Pain in the Newborns

Effective pain management in newborns requires a multidisciplinary team approach to defining the pain with the right method and on time, choosing the appropriate method. Nurses play an active role in pain management, from the planning of care to the assessment and treatment of pain and the selection of appropriate interventions.

Nurses should

- include more evidence-based practices in their practices and follow the studies conducted in this field.
- provide individualized, family-centered developmental care.
- apply direct care in neonatal units, aiming to organize individual care in order to support the development of infants, reduce stress symptoms and increase stability findings.
- use rest periods before and between painful procedures.
- ensure that invasive procedures are performed on time by experienced health personnel and that routinely invasive procedures are minimized (Akcan-Polat, 2017; Derebent-Yiğit, 2006; Joyce et al., 2001; Ovalı, 2002).

CONCLUSION

From the very first days of their life, newborns are exposed to many painful interventions and have to cope with acute and chronic pain. The aim of pain management in newborns is to evaluate and control pain as early as possible. Studies have shown that acute pain in minor interventions can be controlled by non-pharmacological methods. Non-pharmacological methods are easy to apply, practical and cost-effective. They can be effective alone. When used together with pharmacological methods, non-pharmacological methods increase the effectiveness of drugs. Nurses play an important role in pain management among other multidisciplinary healthcare professionals. Therefore, it is recommended that they use non-pharmacological and pharmacological methods to reduce the pain experienced by newborns.

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Plan, design: MA, AN; **Material, methods and data collection:** MA; **Data analysis and comments:** MA; **Writing and corrections:** AN.

Conflict of Interest
The authors declare that they have no conflict of interest.

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