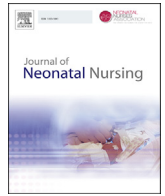


Contents lists available at [ScienceDirect](#)

Journal of Neonatal Nursing

journal homepage: www.elsevier.com/jneo

Review

Prevention of neonatal pressure injuries

Jane Grosvenor, MHsc, RCN ^{a,*},
Maura Dowling, MSc, BNs, RNT, RGN, RM, Cert Oncology, PhD ^b

^a St Clares Neonatal Intensive Care Unit, University Hospital Galway, Newcastle Road, Galway, Ireland

^b National University of Ireland Galway, University Road, Galway, Ireland

ARTICLE INFO

Article history:

Received 10 March 2017

Received in revised form

1 August 2017

Accepted 24 September 2017

Available online xxx

Keywords:

Neonatal

Pressure

Injury

Skin

Risk assessment

ABSTRACT

Pressure injuries in the neonatal unit can cause infection, unnecessary pain and have the potential for scarring. However there is a dearth of information available on this topic. Preventative strategies to address pressure injury development are essential when caring for vulnerable neonatal patients. This article highlights the issues regarding neonatal pressure injuries in clinical practice. In addition, it explores skin assessment and discusses the use of a neonatal skin risk assessment tool as a quality improvement intervention to improve clinical practice and patient outcomes.

© 2017 Neonatal Nurses Association. Published by Elsevier Ltd. All rights reserved.

Introduction

Pressure injury prevention for premature infants is now recognised as an important aspect of nursing care in the Neonatal Intensive Care Unit (NICU). Technological advances in neonatal care have enabled infants to survive at lower gestational ages. However, these neonates are very vulnerable to pressure injuries. Lower gestational age increases the risk of pressure injuries due to necessary life saving medical equipment being in contact with the immature skin. Hence, healthcare professionals are becoming increasingly aware that the prevention of pressure injuries in the NICU is an area of paramount importance.

Neonatal skin physiology

The dermis of a full-term newborn is not as well developed as adult skin, the collagen and elastic fibres are shorter and not as thick, the skin therefore feels very soft (Stamatas et al., 2011). Evidence suggests that due to unique skin physiology, neonatal skin is just as vulnerable to breakdown as the skin of an adult (Allwood, 2011). Infants born at lower gestational ages are more at risk of skin breakdown. The 'stratum corneum', the skin's main protective

barrier is 10–20 layers thick in adult skin. Neonatal skin comprises of less layers with infants less than 30 weeks' gestation only having 2–3 layers and infants born at 24 weeks' gestation or less having no layers at all. Without the protection of the stratum corneum, infants are more at risk of infection, *trans*-epidermal water loss, temperature instability and toxicity from antiseptic cleaning agents. In addition, other differences in preterm skin such as fewer connecting fibres between the epidermis and the dermis, less subcutaneous fat, a thinner dermis and a flattened epidermal junction all increase the risk of neonatal skin injury (Fox, 2011).

Neonatal pressure injuries

A pressure ulcer can be defined as “a localised injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear” (EPUAP and NPUAP, 2009, p.7).

Pressure injury can occur when there is insufficient blood supply to the skin caused by pressure that is not relieved. Constant unrelieved pressure decreases blood flow to the area causing occlusion of blood and lymphatic vessels which leads to cell hypoxia, tissue necrosis and ulcer formation (Grey et al., 2006). In adults, pressure ulcers are more likely to occur over bony prominences where there is less subcutaneous fat. Subcutaneous fat helps to spread the forces applied to the skin evenly over a large surface area therefore reducing the pressure to one particular point (Myers,

* Corresponding author.

E-mail addresses: Jane.grosvenor@hse.ie (J. Grosvenor), Maura.dowling@nuigalway.ie (M. Dowling).

2008). However, premature infants have little if any subcutaneous fat until after thirty-two weeks' gestational age and therefore pressure ulcers can occur on any part of the body (Fox, 2011). Prevalence rates of up to 23% in Neonatal Intensive Care Units have been reported (Baharestani and Ratliff, 2007).

In an era of rapid advances in other aspects of neonatal care it seems that pressure injury prevention practices may be viewed of lesser significance. A possible explanation for this may be because most neonatal skin injuries heal quickly without any intervention. Neonatal skin has a faster rate of wound closure due to an increased number of fibroblasts producing granulation tissue (Fox, 2011). Nonetheless, neonatal skin injuries should be classed as 'never events', and neonatal nurses should be aware of the potential for skin injuries in this vulnerable population.

The incidence rate of pressure injuries among neonates is high, with reports of 16.1% (Fujii et al., 2010), 31.2% (August et al., 2014) and 42.5% (Fischer et al., 2010). Pressure injuries among neonates are commonly found on the occiput and ears and are especially prevalent in those who are critically sick or sedated with an inability to reposition themselves (Ness et al., 2013). According to Baharestani and Ratliff (2007) 50% of skin injuries in neonatal units are caused by friction from medical devices and equipment. More recent research has identified pressure injuries from equipment such as nasal Continuous Positive Airway Pressure (nCPAP) (Fig. 1) and nasal prong cannulae (Fujii et al., 2010; Schumacher et al., 2013; August et al., 2014).

Some pressure injuries can cause irreversible skin damage that requires referral to the plastics team for corrective plastic surgery. A case series of five ventilated neonates identified severe lip injuries from friction and pressure due to the positioning and securing of endotracheal tubes (Fujioka et al., 2008). Visible scarring to the lips of infants was observed and one infant required plastic surgery (Fujioka et al., 2008). The risk of pressure necrosis to the head, nasal septum and nasal bridge when providing continuous positive airway pressure via a CPAP driver has also been widely reported (Furdon, 2003; Ottinger et al., 2016) (Figs. 2 and 3). Some infants have suffered the loss of their nasal septum (McCoskey, 2008). Understandably, this type of injury is devastating for families who have already had to cope with the emotional rollercoaster of having a sick infant admitted to the NICU. In addition, the financial burden on the health service and increased use of hospital resources is unnecessary, especially for a skin injury that may have been prevented. Nurse Managers should ensure neonatal staff are aware of the potential for pressure injuries and receive education on preventative practices so these injuries are less likely to occur.



Fig. 1. Infant on NCPAP device.
Permission Given to use photo by Lorraine Canavan (mother).



Fig. 2. Nasal septum erosion as a result of pressure necrosis from NCPAP device.
Permission given by David A. Clark, MD Professor and Chairman of Pediatrics, Albany Medical College Director, Children's Hospital at Albany Medical Center.



Fig. 3. Pressure necrosis to the head from NCPAP device.
Permission given by Taylor & Francis Ltd. Journal's web site: "<http://www.tandfonline.com/>" <http://www.tandfonline.com/> (Fig 8 from Smeeta R. Sardesai, Maria K. Kornacka, Wojciech Walas & Rangasamy Ramanathan (2011) Iatrogenic skin injury in the neonatal intensive care unit, The Journal of Maternal-Fetal & Neonatal Medicine, 24:2, 197-203).

Prevention of pressure injuries

Evidence based management of neonatal pressure injuries presents some challenges. These include ethical issues arising in the conduct of research with infants. Consequently, there are a lack of best practice guidelines on the management and treatment of these injuries including a lack of appropriate neonatal dressings. Limited knowledge and evidence on treatment options results in variations in practice among practitioners and often wounds are left to heal in the open air without any protection from the risks of infection (Fox, 2011). Infection remains one of the biggest threats to the survival of a neonate and results in a longer hospital stay, poorer neuro-developmental outcomes and an increased use of hospital resources (Anthony et al., 2014). Furthermore, a lack of neonatal guidelines in this area means that policies and guidelines based on adult skin are often adapted and used for neonates. This is inappropriate considering the physiological differences in the neonatal skin makeup. For these reasons, the key to the management of neonatal skin injuries is prevention.

Skin risk assessment tools

A number of neonatal units in the UK, Ireland, the United States and Canada are implementing neonatal risk assessment tools into

Download English Version:

<https://daneshyari.com/en/article/8563734>

Download Persian Version:

<https://daneshyari.com/article/8563734>

[Daneshyari.com](https://daneshyari.com)