

THE MANAGEMENT OF PROCEDURAL PAIN IN NEONATES

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INTRODUCTION

We attach importance to the crying of older children and adults, but we attach less importance when a baby cries. Anything that causes an adult to feel pain will also cause infants to feel the same, irrespective of age.

A study of the reaction to heel lance showed facial activity remaining unchanged during the baseline of lifting and unswaddling but changing significantly during heel prick. There was further increase in facial activity during heel squeezing, followed by decrease during recovery⁽¹⁾. In addition to facial responses other techniques have been used for the assessment of pain in the neonate such as oxygen saturation monitoring, heart rate response⁽²⁾, and more recently Dan's Scoring System which combines facial expression, limb movements and vocalisation⁽³⁾.

DOES NEONATAL PAIN MATTER?

Preliminary studies suggest that pain experienced by an infant in the newborn period may have a longstanding effect on future infant behaviour⁽⁴⁾. An increased frequency of invasive procedures in the neonatal period is associated with subsequent behavioural immaturity as shown by impaired facial responsiveness to pain⁽⁵⁾.

Rat pup studies suggest that preterm babies may experience pain more intensely than mature babies⁽⁶⁾. Thus in contrast to former impressions of insensitivity toward pain, the preterm infant must be considered as hypersensitive and developmentally vulnerable⁽⁷⁾. Exposure to repetitive pain causes excessive excitatory amino acid activation resulting in excitotoxic damage to the developing neurons. These changes promote distinct behavioural phenotypes characterised by increased anxiety, altered pain sensitivity, stress disorders and hyperactive attention deficit disorder, leading to impaired social skills and self-destructive behaviour⁽⁸⁾.

INTERVENTIONS WHICH CAN REDUCE PAIN

Management of pain should be a quality issue in neonatal care just as it is in the care of adults⁽⁹⁾. Pain relief in the newborn can be achieved either by preventing procedural pain, or comforting a baby after a procedure, or both.

A randomised trial showed that the analgesic effect of concentrated glucose or sucrose solutions is more effective than placebo. Pacifiers showed a better response than these sweet solutions. The association of sucrose and pacifiers showed the best response of all⁽³⁾. Though non-nutritive sucking using pacifiers in neonates has received disapproval from breast-feeding promoters⁽¹⁰⁾, meta-analysis has shown that it can cause significant decrease in distress. Larger effects were noted in preterm infants than in term infants and for longer duration of non-nutritive sucking⁽¹¹⁾. Furthermore, a study has suggested that the use of pacifiers during the first five days of life is not associated with lower frequency or shorter duration of breast-feeding during the first six months of life⁽¹²⁾. It is believed that the rapid onset of pain relief elicited by sweet solutions is mediated by endogenous opioids⁽³⁾. The precise mechanism by which pacifiers relieve pain remains to be identified⁽³⁾. The analgesic effect of human milk is less than that of 25% sucrose solution⁽¹³⁾.

Swaddling as a means of comforting babies during and after a painful procedure proved to be an effective intervention, significantly reducing behavioural disturbances in both term and preterm babies⁽¹⁴⁾.

Venepuncture is more effective and less painful than heel lancing for blood tests⁽¹⁵⁾.

In some studies Lidocaine-prilocaine (EMLA) cream appeared safe for heel lancing in preterm infants and in comparison to placebo, EMLA significantly reduced the pain caused by venepuncture on the dorsum of the hand. Its presence does not complicate the puncture of veins⁽¹⁶⁾ but can cause methaemoglobinaemia⁽¹⁷⁾ and is not licensed for infants less than one year. Topical amethocaine gel has an anaesthetic effect on neonatal skin, which merits further investigation⁽¹⁸⁾, but this has not yet been licensed for neonatal use.

Paracetamol has been shown to be inconsistent in decreasing pain from heel prick in term neonates⁽¹⁹⁾.

CONCLUSION

Neonates are vulnerable to pain. A simple measure like venepuncture instead of heel prick, sugar solutions by mouth before a procedure, non-nutritive sucking and soothing a baby by swaddling during and after should be widely adopted. A formal guideline containing a pain management protocol is required in every neonatal intensive care, special care baby unit and postnatal ward.

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