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A Cochrane systematic review and meta-analysis of non-pharmacological pain managements in neonates while undergo heel stick

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Background: Newborns usually undergo routine heel lance procedures for newborn screening, blood sugar level checking, and so on. These invasive medical procedures may initiate their physical discomfort. Therefore, the analgesic intervention may play an important role in pain management. The analgesic intervention can be divided into using medicine and non-drug using methods. The purpose was to systematically review and meta-analyze the effectiveness of non-pharmacological pain managements for infants' pain relieve while undergo invasive medical procedures.

Methods: Medline, PubMed, Chinese Electronic Periodical Service (CEPS), and Cochrane library were searched through October 2016. Systematic review and randomized trials using neonatal heel stick, non-pharmacological pain management, or/and analgesia were included to measure outcomes of pain relief interventions. For each outcome, standardized mean differences (SMD) and 95% confidence intervals (CI) were calculated. The reviewers also inspected related reference lists with forward citation tracking of included studies.

Results: The literatures were reviewed using the Mandarin version of Systematic Review Appraisal Sheets (University of Oxford, 2005) and Assessing Risk of Bias (University of Oxford, 2011). The Oxford Centre for Evidence-Based Medicine Levels of Evidence was used to appraise the literature. 21 studies met the inclusion criteria, after removal of repeated literatures and poor quality studies that did not alter the conclusions, five articles were then selected. Two were systematic analysis, and the others were randomized controlled trials. The results indicated that the non-nutritive sucking and soothing behaviors were effective at reducing acute pain in newborns (SMD=-0.46; 95% CI, -0.64 to -0.33; $p<0.05$). Additionally, kangaroo mother care and wrap/swaddle newborn baby were more suitable for premature infants with pain relief (SMD=-0.59; 95% CI, -0.77 to -0.30; $p<0.05$). Currently, nutritional sucking is considered the most effective way to eliminate neonatal pain (SMD=-0.34; 95% CI, -0.58 to -0.09; $p<0.01$).

Conclusion: This systematic review found non-pharmacological analgesic interventions can effectively relieve neonatal pain when they have invasive medical procedures. Nutritional sucking was more effective in decreasing neonatal pain while undergo heel stick when compare with non-nutritional sucking and soothing behaviors (moderate quality evidence), and kangaroo mother care and wrap/swaddle newborn baby (low quality evidence). Nutritional sucking can be recommended as an intervention to moderate neonatal pain to enhance the quality of care.

Biography

Yun Shan Tseng is a full assistant professor at Department of Nursing, I-Shou University, Taiwan. She has completed her Ph.D. from University of Texas Health Science Center at Houston, Texas, USA in 2009. Her current research interests include the parental anxiety, pediatrics nursing, and nursing education.

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