

Validation of a neonatal pain scale adapted to the new practices in caring for preterm newborns

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ABSTRACT

Background Neonatal pain assessment generally requires access to facial expression. Improved neonatology practices, such as greater protection against bright lights and non-invasive mask ventilation, have made facial observation more difficult.

Objective To validate a 'faceless' acute neonatal pain scale (FANS), which does not depend on facial expression.

Methods In a prospective, multicentre study, 24–40-week-old neonates were videotaped during a painful procedure (heel prick). Three investigators then scored the pain using FANS and a previously validated scale: DAN (Douleur aiguë du Nouveau-né). FANS is based on assessment of limb movement, cry and autonomic reaction. Reliability was assessed by inter-rater agreement and internal consistency (Cronbach's α). Validity was evaluated by agreement between scales (intraclass correlation coefficient (ICC)). The Wilcoxon test evaluated the FANS score differences between conditions. Results are expressed as medians (25th and 75th percentiles). Ranges are presented for outcome parameters.

Results From April 2006 to September 2007, 53 preterms of 32 (30–35) gestational weeks and 1500 (1000–2200) g were observed. Cronbach's α was 0.72. The ICC was 0.92 (0.9–0.98) for inter-rater agreement and 0.88 (0.76–0.93) for agreement between scales.

Conclusion FANS, which is reliable and valid, is the first scale to score pain in preterm newborns when facial expression is not accessible.

The pathways for pain conduction are present as of 23 weeks of gestation,¹ but pain management is often delayed in neonatal intensive care units (NICUs) because the detection of pain and the assessment of its intensity can be difficult. Different scales are used, all based on the evaluation of several factors but having in common the study of facial expression, which is considered to be the most discriminating element in the evaluation of neonatal pain.^{2,3} However, facial expression has become less accessible over the past 15 years because of changes in treatment practices, particularly non-invasive mask ventilation and limited light exposure during medical procedures.⁴ A recent investigation in our unit revealed that facial expression was inaccessible in 39% of the newborns during acute care, either because they were being protected from bright lights (2/3 cases) or because they were wearing non-invasive ventilation masks (1/3) (personal communication). Many pain scales have been developed,

What is already known on this topic

- ▶ Premature neonates experience pain. Treatment is based on reliable evaluation and is adapted to the clinical situation of each infant.
- ▶ All scales for evaluating neonatal pain incorporate items on facial expression.
- ▶ Neonatal facial expression is often inaccessible to the care giver because current neonatology practices include protection against bright lights and non-invasive facial masks for ventilation.

What this study adds

- ▶ This study proposes the first scale for evaluating acute pain in newborns when the face is not accessible.
- ▶ This simple and easy to use scale can be used at the bedside.
- ▶ This scale was validated by comparison with a validated scale (Douleur aiguë du Nouveau-né (DAN)), with an intraclass correlation coefficient of 0.88 (0.76–0.93).

and the detection and prevention of pain have been greatly improved.⁵ The validation of a scale adapted to the changes in NICU care thus seemed necessary.

The objective of this study was therefore to validate a new scale to evaluate pain in neonates whose faces were not visible to the care giver and to determine whether this scale was able to differentiate a painful procedure from non-nociceptive stimulation.

METHODS

Design and setting

We carried out this multicentre prospective study in the level III NICUs of Montpellier, Nimes and Perpignan, France. All neonates born at 24–40 weeks of gestation were eligible if their faces were visible. Thus, newborns who were intubated or who were on non-invasive ventilation were not eligible.

One videotape per newborn was made. Only the tapes of sufficient quality to clearly observe facial expression and limb movement and to hear vocal