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Research paper

Training program for pain assessment in the newborn

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ABSTRACT

Aim: Pain management is correlated with pain assessment in the newborn infant. The aim of this study was to assess the impact of a 2-week training program composed of short (20 min), repeated training sessions conducted in the unit.
Methods: Pain assessment was studied by means of audits. Each audit included data recorded from the newborn infant's medical charts on the day the infant was admitted to the unit and 3 days before the audit. An audit was performed before the training program and then repeated every month for 12 months.
Results: Eighty-eight (53.7%) members of the neonatology staff were trained during the 2-week training program. After the training program, pain assessment "at least once a day" increased by 39.0% and pain assessment "at least once a shift" increased by 21.5% compared to baseline ($P < 0.05$). The effects of the training program were maintained after 12 months ($P < 0.05$).
Conclusion: A training program with short, repeated sessions conducted in the unit trained 53.7% of the neonatology staff and increased the frequency of pain assessment.

Key notes

Short and repeated 2-week pain assessment and management training sessions performed in the unit trained 53.7% of the neonatology staff. Pain assessment was significantly improved after the training program and was maintained after 12 months.

1. Introduction

Published data suggest that repeated and prolonged pain may alter the subsequent development of the pain system and contribute to long-term deterioration of the newborn infant's behavior [1–3]. The combination of lower pain thresholds and an immature inhibitory system result in hypersensitivity to pain in preterm newborns [1]. Pain assessment is therefore of paramount importance [1].

Pain assessment and management are considered a healthcare priority for newborn infants [4–13]. Many national organizations, including the American Pain Society, and local hospitals have endorsed this standard and recommend regular pain assessment and management training [5–11,14]. The frequency of pain assessment training to ensure optimal pain management in newborn infants has not been clearly defined [5–11,14].

At Amiens University Hospital, nursing training in neonatal pain assessment is performed during an annual 1-day session. This training frequency appears to be inadequate and the results obtained in the unit are not always considered relevant.

The aim of this study was to assess the impact of a short, repeated training program on pain assessment over time in order to determine whether this type of training is beneficial and how frequently it should be repeated. Short, repeated training sessions therefore focused on the pain assessment scale specifically used in newborn infants. These sessions were organized in the unit with the neonatology team.

2. Materials and methods

2.1. Population

Newborn infants admitted to the various units of Amiens University Hospital managing newborn infants were included:

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- the neonatal intensive care unit (NICU);
- the neonatology unit;
- the Kangaroo unit;
- the maternity unit.

Newborn infants older than 28 days at their initial admission to the NICU and infants receiving palliative care were excluded from the study. This study was approved by the local ethics committee (#106, November 27, 2012).

2.2. Training program

The training program consisted of 20-min sessions including a visual support, an oral interactive presentation, the results of a baseline audit of the unit's pain assessment practices and a written document given to each staff member [15]. The training program focused on the consequences of pain in newborn infants, the pain scales used in the unit and pain management. Posters on the training program were also placed in each unit for 2 weeks. Training sessions in each unit were planned in collaboration with a pain physician. They were repeated daily for 2 weeks to ensure that most staff members were able to attend a training session during the period.

2.3. Pain assessment audits

Data were recorded prospectively from the medical charts of newborn infants admitted to the various units of Amiens University Hospital. The pain assessment score was studied. Data were audited "on admission to the unit" and three days before the audit. Staff members were not informed of the date of the audit. Pain assessment was considered "on admission to the unit," "at least once a day" and "at least once a shift" (shift changes every 12 h).

2.4. Audit protocol

After a baseline audit, the nursing staff of the four units attended the pain assessment training program. Repeated audits were then performed every 2 weeks (weeks 1, 3, 5 and 7) and then monthly for a total duration of 12 months.

Statistical analyses were performed with Statview software (version 5.0, SAS Institute Inc., Cary, NC, USA). Data were analyzed with repeated measures analysis of covariance or the Student *t*-test. Data are expressed as mean ± standard deviation (SD) [range] or number (proportion). $P < 0.05$ was considered statistically significant.

3. Results

A total of 812 medical charts were audited between 1 December 2012 and 31 December 2013:

- 156 in the NICU;
- 198 in the neonatology unit;
- 134 in the Kangaroo unit;
- 324 in the maternity unit.

During the 2-week training program, 88 (53.7%) nursing staff members attended a training session, with very different proportions depending on the unit, ranging from 2.13% to 100% (Fig. 1). The 2-week training program represented a cumulative total of 14 h for the pain physician.

The characteristics of the newborn infants admitted to the NICU, neonatology unit, Kangaroo unit and maternity unit and included in the study are shown in Table 1.

The overall rate of pain assessment (regardless of the unit considered) "on admission to the unit" before the training program was 79.7 ± 23.6% and was not significantly different after the training program (week 1: 91.5 ± 11.0%; $P = 0.20$; Fig. 2, panel A). The results remained stable over time with no significant change from the baseline except for a transient decrease at month 9 ($P < 0.05$) and no differences at months 10 and 11.

The rate of pain assessment "on admission to the unit" before vs. week 1 after the training program increased by 7.7% in the NICU (81.2% vs. 88.9%), 20.7% in the neonatology unit (46.1% vs. 76.9%), 9.0% in the Kangaroo unit (90.9% vs. 100%) and 0% in the maternity unit: (100% vs. 100%). A significant difference was observed between the maternity unit vs. the neonatology unit ($P < 0.05$) and the maternity unit vs. the NICU ($P < 0.05$).

The overall rate of pain assessment (regardless of the unit considered) "at least once a day" before the training program was 45.2 ± 17.2% and was significantly increased after the training program (baseline: 45.2 ± 17.2% vs. week 1: 84.2 ± 9.7%; $p < 0.005$; Fig. 2, panel B). The results then remained stable with a persistent change compared to baseline over time ($P < 0.05$).

Depending on the unit, the rate of pain assessment "at least once a day" before vs. week 1 after the training program increased by 54.0% in the NICU (22.2% vs. 76.2%), by 38.6% in the neonatology unit (58.6% vs. 97.2%), 35.7% in the Kangaroo unit (41.7% vs. 77.4%) and 29.8% in the maternity unit (58.3% vs. 86.1%). Pain assessment "at least once a day" was significantly different between the maternity unit and the NICU ($P < 0.05$).

The overall rate of pain assessment (regardless of the unit considered) "at least once a shift" before the training program was 39.5 ± 18.8% and was significantly increased after the training program (baseline: 39.5 ± 18.8% vs. week 1: 61.0 ± 11.5%; $p = 0.02$; Fig. 2, panel C). The results then remained stable with a persistent change from baseline over time, except for a transient decrease at month 9 that was spontaneously corrected at months 10 and 11 (Fig. 2, panel C).

The pain assessment rate "at least once a shift" before vs. week 1 after the training program increased by 40.7% in the NICU (15.6% vs. 56.3%), 12.9% in the neonatology unit (56.0% vs. 64.9%), 14.6% in the Kangaroo unit (33.4% vs. 48.0%) and 21.9% in the maternity unit (52.9% vs. 74.8%). Pain assessment "at least once a shift" was significantly different between the maternity unit and the NICU ($P < 0.05$).

4. Discussion

A training program consisting of short, repeated sessions conducted in the unit totalled only 14 h for the physician and trained 88 (53.7%) members of the neonatology nursing staff. After the training program, the rate of pain assessment "at least once a day" increased by 39.0% and pain assessment "at least once a shift" increased by 21.5% between baseline and week 1.

The pain assessment rate was high, even in newborn infants at low risk of induced pain in the maternity unit. A study reviewing patient charts to identify documented pain assessment observed that only 18% of children had three or more documented pain scores during the previous 24 h [9]. Other studies have shown differences in the around-the-clock use of analgesics that could be similar to the differences observed in this study between "at least once a day" and "at least once a shift" assessments [16].

The best results for all criteria were observed in the maternity unit. A discordance was observed between pain assessment and the clinical "severity" of the patients, as newborn infants in the maternity unit had a higher mean birth weight than those admitted to the NICU, corresponding to premature infants, low-birth-weight infants, or infants with intrauterine growth retardation, resulting

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