

Pain relief in ventilated preterm infants during endotracheal suctioning: the need for an integrated approach

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Dear editor,

Many procedural interventions during a neonatal stay remain a burden as they cause pain or discomfort. We therefore appreciate the randomised controlled trial reported in this journal on the impact of a pharmacological (intermittent morphine) and a non-pharmacological intervention (multisensorial stimulation) on pain relief during endotracheal suctioning in preterm neonates [1]. In brief, neither morphine, nor multisensorial stimulation resulted in pain relief based on the assessment tools used. This led the authors to conclude that further research should focus on other non-pharmacological interventions to relieve pain during endotracheal suctioning. In addition to their conclusions, we would like to re-emphasise the potential relevance of evaluating and comparing techniques on the associated pain response as has been documented for blood sampling, venipuncture being less painful compared to heel lancing [2].

Similarly, we and others suggested that procedural adaptations in the endotracheal suctioning technique (i.e. closed suction) also result in a blunted pain response [3, 4]. The stress response associated with closed endotracheal suctioning was documented in 10 ventilated neonates to evaluate the correlation between catecholamine increase and increase in pain score to validate a neonatal pain scale. Findings in this cohort were compared with an earlier reported cohort from the same unit where open suctioning was applied. Based on vital signs and pain assessment, a blunted stress response was observed following closed endotracheal suctioning [3]. Similar observations have been described by Tan *et al.* using a paired approach in 15 ventilated preterm neonates [4].

Adequate management of pain necessitates an integrated approach. Such an approach is not only limited to systematic evaluation of pain and subsequent use of validated pharmacological and non-pharmacological interventions, but should also include the use of the most effective methods to perform a given procedure [2]. In addition to the prospective validation of various pharmacological and non-pharmacological interventions for procedural pain relief as suggested by the authors, there is another extensive field of prospective evaluation of various procedural techniques waiting for neonatal caregivers, nurses and doctors, to provide us with the data we urgently need to further reduce the pain and stress related to the medical and nursing care in preterm neonates.

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Response to the "letter to the editor" of Tison and colleagues

We welcome the comment of Tison and colleagues related to our article. Without any doubts their emphasis on the development and evaluation of procedural techniques having the potential to reduce the pain response in neonates is an important aspect of pain management in neonatal intensive care units (NICUs). This aspect was also considered in our trial using the "closed suctioning-method", which is reported to cause dampened pain responses for ventilated infants, compared to the "opened suctioning-method" [1]. We believe, that the development of such medical devices needs further strengthening and should be achieved through a strong collaboration between clinicians and industrial representatives.

It should be emphasised that pain management in neonates in the clinical setting requires a comprehensive approach and not be focused on isolated aspects of pain treatment only. Pain management encompasses three not mutually exclusive elements as follows

- 1 the use of pharmacological agents based on guidelines [2] and well established algorithms,
- 2 the systematic and standardised provision of non-pharmacological pain relieving interventions [3],
- 3 the use of procedural devices known to blunt pain responses [4] in the most frequently performed routine procedures like blood sampling, venipuncture and endotracheal suctioning [5].

Moreover, the provision of a systematic and effective pain management is primarily related to system factors, which are very often underestimated in the discussion such as

- 1 an existing strategy of clinical pain management established by the executive medical and nursing leadership of a clinic including the development of guidelines for the specific setting,

- 2 the provision of a regular in-service education to address current limitations in the pain knowledge deficits of the NICU staff, and facilitate nurses' and physicians' use and understanding of research to improve clinical outcomes related to pain,
- 3 the implementation of role models like "Advanced Nurse Practitioner" (ANP) in the clinic. ANP show potential to contribute favourably to guaranteeing optimal health care in their field of expertise [6],
- 4 reducing the time of difficult invasive procedures by assigning for the most vulnerable infants (<28 weeks) the most experienced nurses, ANPs and neonatologists.

The consideration of all these elements in neonatal pain management is in line with the "need for an integrated approach" as stated by Tison and colleagues. An integrated approach encompasses the potential to influence the daily clinical setting in order to improve outcomes of a highly vulnerable patient population like neonates hospitalised in a NICU.

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On behalf of all the co-authors

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