NEUROCOGNITIVE ASSESSMENT OF ACUTE PAIN IN INFANTS: A SCOPING REVIEW OF THE METHODS THAT CONSTRUCT THE SCIENTIFIC KNOWLEDGE BASE

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INTRODUCTION / AIM

While infant pain assessment has historically relied on behavioral pain scores, use of neurocognitive imaging methods is an emerging trend. The aim of this work was to describe the neurocognitive methods that have been used to construct the scientific knowledge base in the field of infant acute pain assessment.

METHODS

A systematic search of key electronic databases (CINAHL, PubMed, PsycINFO, EMBASE) was conducted from database inception to October 2015. The search strategy included key terms for infant, acute pain, pain response, and neurocognitive imaging methods. Of the 2411 abstracts screened, 19 articles were retained and data on study methodology were extracted.

RESULTS

Of the included studies, nine utilized near infrared spectroscopy (NIRS), two utilized functional magnetic resonance imaging (fMRI), and eight utilized electroencephalography (EEG) as the primary outcome. There was variability in research designs and procedures in those studies utilizing NIRS, whereas studies utilizing EEG and fMRI reported consistent methods across studies. Of the eight EEG studies, six reported event-related potentials (ERPs) as the primary outcome. All of the ERP studies identified a distinct nociceptive-specific potential, which was found to be stimulus intensity dependent, independent of sleep state, and present in preterm and full term infants.

DISCUSSION / CONCLUSIONS

Of the neurocognitive methods used to date, ERPs appear to be the most sensitive, specific, and reliable indicator of infant nociception. While additional research is needed, ERPs may be a valuable neurocognitive indicator to supplement behavioral pain tools for use in clinical research to advance our understanding of infant pain response.

OTHER AUTHORS

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