A DETAILED ANALYSIS OF INTRAOPERATIVE PAIN MEASURED WITH THE NEWBORN INFANT PARASYMPATHETIC EVALUATION (NIPE) MONITOR IN NEONATES AND INFANTS UNDERGOING OPEN AND LAPAROSCOPIC INGUINAL HERNIA REPAIR.

Mahesh Sakthivel BMedSc(Hons), MD1,2, Tanay Bapna BMedSc(Hons), MD1,2, Svetlana Ivanic BSc(Hons)1, Cassandra Lang MBBS, FANZCA1, Ramesh Mark Nataraja MBBS BSc(Hons) GCCS(Hons) MSurgicalEd FRCSed (Paed.Surg) FFSTEd SFHEA FRACS (Paeds)1,2, Maurizio Pacilli MBBS (Hons), Paed Surg (IT), MD (Research), FRCS (Paed Surg), FRACS12

1Monash Children's Hospital, Melbourne, Victoria, Australia. 2Monash University, Melbourne, Victoria, Australia

Abstract

Background: The Newborn Infant Parasympathetic Evaluation (NIPE) monitor is an objective, non-invasive tool for the assessment of pain in children <2 years-of-age. Aim of this study was to perform an objective and detailed analysis of the intraoperative pain in infants undergoing open and laparoscopic inguinal hernia repair (IHR) using the NIPE monitor.

Method: This prospective observational study included neonates and infants undergoing elective open and laparoscopic (3-port technique) IHR under general anaesthesia (UGA) with a caudal block. The NIPE monitor was connected to the electrocardiogram monitor with continuous monitoring performed intraoperatively. The NIPE index was recorded at different intraoperative steps and the median NIPE (NIPEm) index [range] was calculated for the entire procedure; NIPE index ranges from 0-100, lower values indicate greater levels of pain, values <50 indicate severe pain. P values <0.05 were considered significant.

Results: 40 infants were recruited: 27 underwent open and 13 laparoscopic IHR. NIPEm was significantly lower in the laparoscopic group (open 77.00 [46.00-91.50] vs. laparoscopic 59.00 [41.00-81.00], p=0.002), indicated higher level of pain. For open IHR, no intraoperative steps had a NIPE index of <50, indicating overall absence of pain (Figure 1A). For laparoscopic repair, a NIPE index of <50 was found for umbilicus incision, gas insufflation, port incisions and umbilicus closure (Figure 1B).

Conclusion: This is the first study to objectively demonstrate that UGA and caudal block, laparoscopic IHR is more painful compared to open IHR. This difference is explained by painful stimuli in anatomical areas not covered by the caudal block.