Evaluation of perfusion index as an objective tool to assess analgesia during laparoscopic surgeries under general anaesthesia

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Background and Aims: Changes in the sympathetic nervous system by pain can impact smooth muscle tone and can alter perfusion. This can be monitored by perfusion index (PI). It is a non-invasive, indirect, and continuous measure of peripheral perfusion. This study investigates the changes in PI due to painful stimuli under general anaesthesia.

Methods: Twenty patients between the ages of 20 and 45 years, with informed consent, who were undergoing elective laparoscopic procedure, and belonging to the American Society of Anesthesiologists (ASA) physical status class I were connected with standard monitors along with SEDLINE, pulse oximetry (Root, Masimo Corporation®, Irvine, CA, USA) to monitor PI and Pleth-Variability Index (PVi). General anaesthesia was administered. PI, PVi, heart rate (HR), and non-invasive blood pressure were recorded pre-induction, during induction, before and after intubation, at the time of pneumoperitoneum (P0), and first laparoscopic port insertion (P1). Later, intravenous injection of fentanyl 0.5 μg/kg was administered and values were recorded at the second (P2) and third (P3) port insertion. The aforementioned parameters were recorded for up to 30 minutes. Statistical confirmation was done through paired t tests.

Results: PI values after fentanyl increased from 5.33 ± 2.67 (P1) to 5.99 ± 2.8 (P2) ($P < 0.001$), and to 6.3 ± 2.88 (P3) ($P < 0.001$). This increase correlated with a decrease in HR, from 101.42 ± 12.53 (P1) to 87.93 ± 10.98 (P2) ($P < 0.001$), and to 83 ± 10.82 (P3) ($P < 0.001$).

Conclusion: PI can be a tool to monitor the nociception in anaesthetised patients when administering analgesia.