

## Correlation of Different Time Measurements of the Surgical Pleth Index with Postoperative Pain: A Prospective Observational Study



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### Abstract:

**Background:** The Surgical Pleth Index (SPI) has been introduced to monitor intraoperative pain under general anesthesia. This study aimed to determine the optimum time to measure intraoperative SPI, which correlates better with postoperative pain.

**Methods:** This prospective blind study collected data from female patients scheduled for elective abdominal hysterectomy under general anesthesia. SPI was recorded 5 minutes after the skin incision and 10 minutes before recovery. After recovery, upon the ability to communicate, all patients were asked to quantify their pain level. The primary outcome was determining which SPI measurement correlates more with postoperative pain.

**Results:** In the current study, we found a statistically significant correlation between SPI 10 min before recovery and the highest NRS ( $r=0.555$ ,  $p\text{-value} < 0.001$ ). With the highest sensitivity and specificity, the cut-off value of SPI at 10 minutes before recovery to differentiate between moderate and severe pain was 57. On the other hand, no significant correlation was observed between SPI 5 min after skin incision and the highest NRS. Also, SPI 10 at minutes was significantly correlated with postoperative tramadol consumption, which was unlike SPI at 5 minutes.

**Conclusion:** SPI is a good indicator for nociception. Pre-arousal SPI score correlates more with postoperative pain scores and opioid consumption than SPI score after skin incision. Also, SPI 10 minutes before recovery value of 57 was the cut-off value, with the highest sensitivity and specificity, to differentiate between moderate and severe pain.

### Abstract:

**Clinical Trial Registration Number:** The study was conducted after registration on ClinicalTrials.gov (NCT 04724564; principal investigator: Mohamed Ahmed Hamed; date of registration: January 26, 2021).

**Keywords:** The surgical pleth index, Postoperative pain, Abdominal hysterectomy, PCA, Skin incision, Intraoperative pain.