

The Nociception Level (NoL) in Patients Undergoing Video-Assisted Thoracoscopic Surgery (VATS) With and Without Thoracic Epidural Analgesia. A case series.



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Background

PMD100™ (Medasense Biometrics Ltd., Ramat Yishai, Israel) is a novel non-invasive nociception monitor. The device integrates multiple physiological parameters, including heart rate, heart rate variability, photo-plethysmogram, skin conductance, its fluctuations and their time derivatives to compute a real-time level of nociception (NoL).

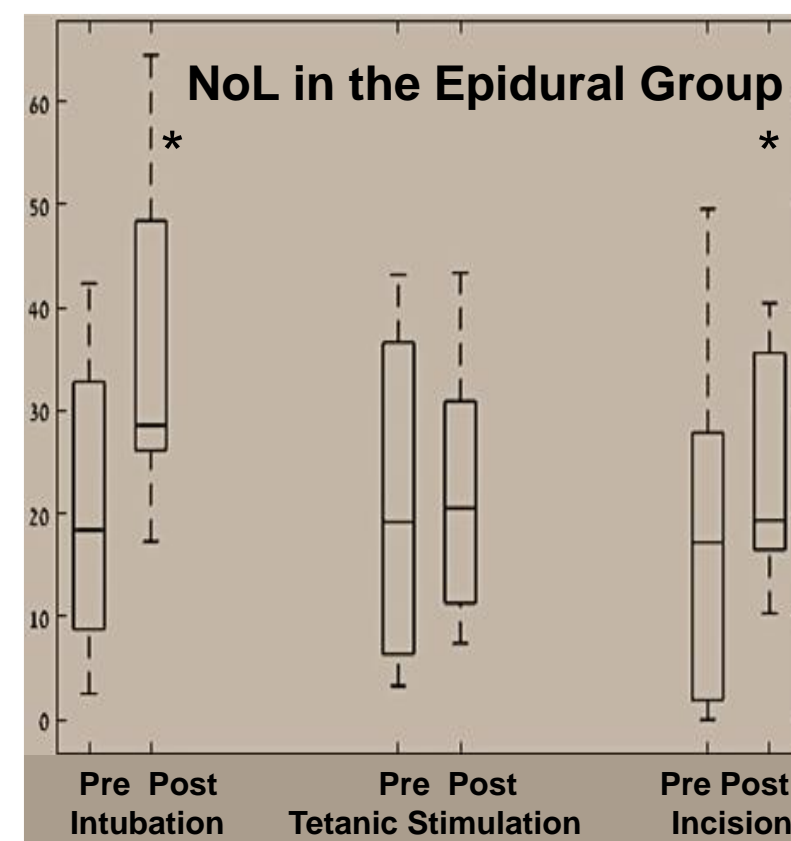
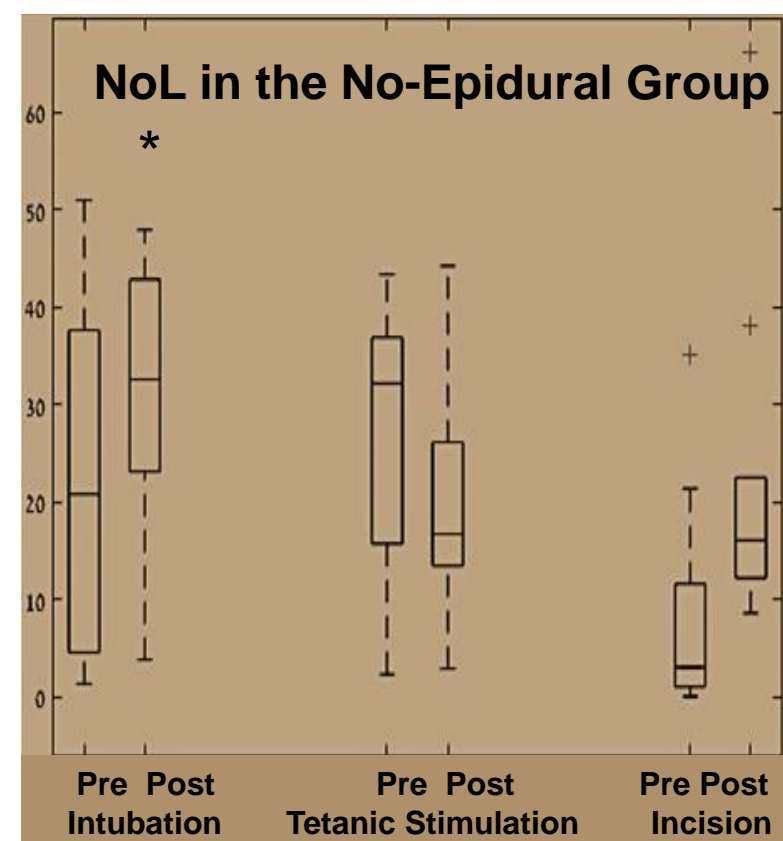
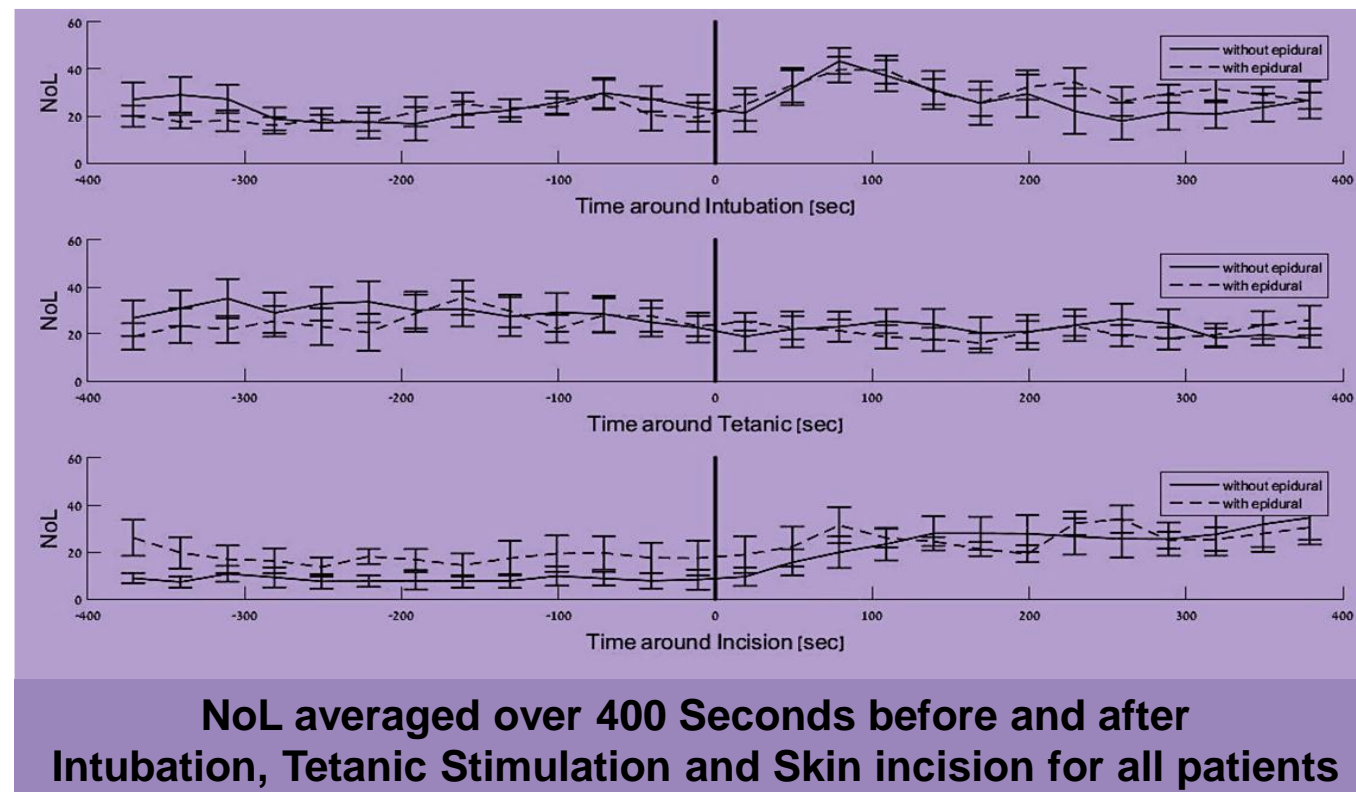
The NoL ranges from 0-100: A NoL of 0 represents a low sympathetic activation suggesting a pain free state, and vice versa.¹ Thoracic epidural analgesia (TEP) improves surgical outcomes after thoracotomies. Side effects include sympathectomy, hypotension, changes in skin temperature and a decreased cardiac accelerator fiber tone. These changes could affect NoL measurements.

The purpose of this pilot was to evaluate the feasibility of NoL measurements in the setting of epidural analgesia.

Methods

25 subjects underwent Video-Assisted Thoracoscopic Surgery (VATS) under general anesthesia. Preoperative TEP were placed per anesthesiologist's discretion.

Routine, weight-based induction using lidocaine, propofol, fentanyl, and vecuronium was performed, followed by intubation and ulnar tetanic stimulation (60mA, 100 Hz, 20 seconds).



Methods

The NoL and hemodynamic parameters were continuously measured from the start of anesthesia until 5 minutes after skin incision.

If in situ, TEP was bolused with 5mL 2% lidocaine 5 minutes before skin incision. NoL values were compared using the student t-test 60 seconds before and 150 seconds after the nociceptive events.

Results

17 out of 25 (68%) consented subjects were analyzed, of which 8 received an epidural (47%). 8 subjects were excluded due to technical issues (32%).

The NoL significantly increased after intubation in all patients from 21.6 (4.1) to 33 (3.9) (p=0.007) and after skin incision in patients of the No-Epidural group: 8.4 (4) to 22, 5 (6.1); p=0.001, but not in the Epidural group: 17.4(6.9) to 24.3 (4.4);p=0.07.

Conclusion

The PMD100™ monitor reliably detected an increase in nociception (NoL) after intubation and skin incision in the No-Epidural group. The NoL did not increase in the epidural group after skin incision, suggesting effective analgesia. Importantly, these results suggest that the PMD100™ monitor may be used in patients with TEP.