



TcMEPs and Pregnancy

Sarah E. Baran, PhD, CNIM, Jeffrey Cohen, MD, PhD, Anthony K. Sestokas, PhD, DABNM,
Herman Mendez, DABNM, CNIM, Samuel Weinstein, MD, MBA

¹SpecialtyCare, Nashville, TN, USA

Introduction

Safety is a major factor influencing the choice to use tcMEPs during surgical procedures. Recently updated guidelines discuss tcMEP use in clinical situations, which were previously thought to represent contraindications (1). However, the guidelines do not address, and very little information has been published examining the impact of tcMEPs during pregnancy (2). We have monitored tcMEPs during spine surgeries in pregnant patients with no untoward side effects. Three of the cases are presented here.

Case descriptions

Three pregnant patients with tcMEP monitoring were identified. A chart review for all three patients was conducted.

Patient 1 case history:

A 22 year old woman with T1-2 arachnoid cyst and progressive lower extremity weakness underwent a C6-T2 laminectomy to evacuate the cyst. She was 33 weeks pregnant at date of surgery. Presented with BLE weakness.

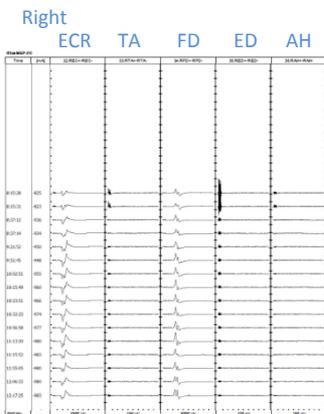
Patient 2 case history:

A 26 year old woman with T6/7 vertebral body fractures and a 2mm retropulsed T6 vertebra following a motor vehicle accident underwent a T4-T9 posterior fusion. She was 4 weeks pregnant at the date of surgery. No notable neurological deficits prior to the procedure.

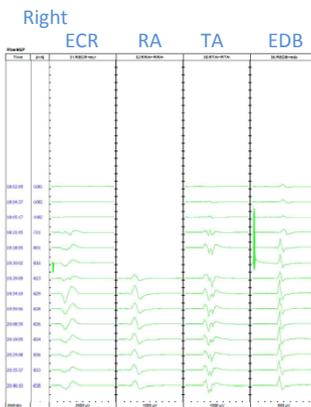
Patient 3 case history:

A 25 year old woman with blunt trauma following a motor vehicle accident underwent an L1-3 posterior spinal fusion. She was 9 weeks pregnant at the date of surgery. Limited information about pre-op status. Due to other injuries, lower leg MEPs were not obtained. MEPs were minimized due to pregnancy concerns.

TcMEP Data Pt. 1



TcMEP Data Pt. 2



TcMEP Data Pt. 3

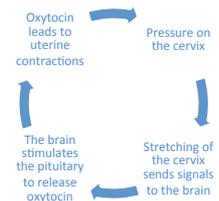
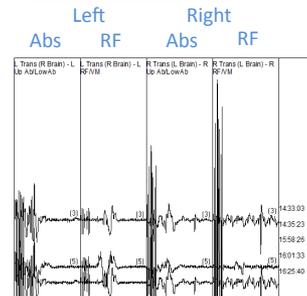


Figure: Oxytocin cascade during labor. Electrical stimulation of the medial forebrain (3), sciatic nerve and vagus nerve (4) increases oxytocin release.

Conclusions

- TcMEPs are recordable from patients who are pregnant.
- There is no indication that tcMEPs impacted the pregnancies of patients in the presented cases, which is consistent with other anecdotal cases and the previously published case (2).
- The decision to use tcMEPs in pregnant patients must weigh benefits vs. the potential risk in each individual patient.
- Further examination, including prospective studies examining the impact of tcMEPs on pregnancy, is warranted because of the potential for electrical stimulation to induce labor via hormonal cascades.

References

1. Legatt, A.D. et al. (2016). ACNS guidelines: Transcranial electrical stimulation motor evoked potential monitoring. *Journal of Clinical Neurophysiology*. 33(1) 42-50.
2. Pastor, J. et al. (2010). Monitoring of motor and somatosensory systems in a 26-week pregnant woman. *Acta Neurochirurgica*. 152: 1231-1234
3. Ingram, C.D., Sutherland, R.C., and Wakerly, J.B. (1988). Oxytocin release evoked by electrical stimulation of the medial forebrain in the rat: Analysis of stimulus parameters and supraoptic neuronal activity. *Neuroscience* 27(2), 597-605
4. Stock, S. and Uvnas-Moberg, K. (1988). Increased plasma levels of oxytocin in response to afferent electrical stimulation of the sciatic and vagal nerves and in response to touch and pinch in anesthetized rats. *Acta Physiologica Scandinavica* 132(1), 29-34