

Masimo SET Technology Using Perfusion Index Is a Sensitive Indicator for Epidural Onset

Kakazu CZ, Chen BJ, Kwan WF. *Anesthesiology* 2005; 103: A576.

Introduction

Perfusion Index (PI) reflects the degree of pulsatile blood flow at the monitoring site. Various factors including vascular tone can influence the PI values. The authors have previously demonstrated that increases in PI values are a rapid and reliable indication of a functioning epidural catheter.¹ The authors conducted this study to determine the sensitivity of the PI value to small test doses of epidural anesthetic. The benefit of this would be that the functionality and placement of the epidural catheter could be determined prior to the infusion of the full anesthetic dose.

Methods

A total of 16 adult women undergoing labor had a Masimo SET Radical attached to the toe prior to epidural catheter placement. Baseline values for blood pressure, heart rate and PI were noted and recorded every minute thereafter. Following this, an epidural catheter was placed and a small test dose of local anesthetic was administered. Five minutes later the epidural catheter was infused with incremental doses of 0.25% bupivacaine.

Results

Paired t-test comparing baseline PI vs 5 min PI, baseline PI vs 20 min PI and 5 min PI vs 20 min PI shown below, demonstrate significant changes in PI over time following infusion of anesthetic test dose. Figure two shows the distribution (with the lowest bar representing the 10th percentile and the upper most bar representing the 90th percentile of the data) of the PI values at each of the time periods; at baseline, 5 minutes, and 20 minutes.

Figure 1

Paired t-test

Hypothesized Difference = 0

	Mean Diff.	DF	t-value	p-value
Baseline PI, 5 min PI	-1.845	15	-5.171	.0001

Paired t-test

Hypothesized Difference = 0

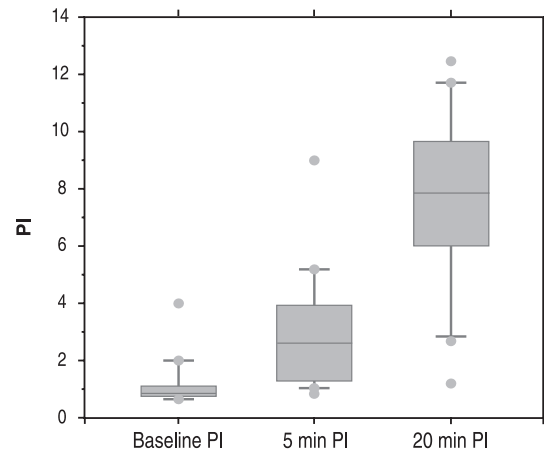
	Mean Diff.	DF	t-value	p-value
Baseline PI, 20 min PI	-6.269	15	-8.335	<.0001

Paired t-test

Hypothesized Difference = 0

	Mean Diff.	DF	t-value	p-value
5 min PI, 20 min PI	-4.424	15	-5.687	<.0001

Figure 2



Discussion

Easy and rapid detection of a functioning epidural catheter is important, especially in the laboring patient. After infusion of a small amount of local anesthetic solution (3ml), the average PI doubled from baseline to 5 minutes.

Authors' Conclusions

"PI is a sensitive indicator of a standard test dose of 1.5% lidocaine with 1:200,000 epinephrine (p-value=0.0001... Early detection of proper catheter placement is paramount in the obstetrical patient. We have devised a sensitive and reliable monitor for early detection of epidural anesthesia onset by measuring tissue perfusion changes in the lower extremities."

1. Kakazu CZ, Wu T, Chen BJ, and Kwan WF; Toe Perfusion Index as an early detection device for Proper Epidural Catheter Placement in Obstetrical Patients. *Anesthesiology* 2004, 101:A-1187.