

A Comparison of Radial Artery Blood Pressure Determination between the Vasotrac device and Invasive Arterial Blood Pressure Monitoring in Children Undergoing Scoliosis Surgery

Mary E. McCann, MD; David Hill, MBBS; Kristi Thomas, RN; Peter C. Laussen, MBBS
Department of Anesthesiology, Children's Hospital Boston, Boston MA

Introduction: A new non-invasive method to measure blood pressure and arterial waveform is now commercially available (Vasotrac, Medwave, Arden Hills, MN). A computer algorithm is used to calculate the arterial pressure, which is displayed along with the arterial waveform every 12-15 beats. Unlike the oscillometric method, circumferential cuff compression is not required. This device may therefore prove to be a suitable alternative to the oscillometric cuff blood pressure, as well as providing many of the advantages of direct invasive blood pressure monitoring. To date this device has been tested in adults^{1,2}, but its usefulness in children is yet to be validated. Currently, only one transducer size is available and smaller sensors may be required for the smaller wrists in younger children and infants. The purpose of this current study is to evaluate usability and accuracy of the Vasotrac blood pressure monitor in adolescent children in a variety of physiological states (prone, supine, and controlled hypotension).

Methods: After receiving IRB approval, 12 children undergoing surgery for idiopathic scoliosis were enrolled in this study. There were 11 females and 1 male and their average age was 14.1 ± 1.0 years. Continuous invasive arterial blood pressure (IABP) and arterial waveforms were obtained via a radial artery catheter and compared to blood pressure and waveforms obtained with the Vasotrac from the opposite radial artery. The anesthetic consisted of primarily a fentanyl/nitrous oxide technique. Controlled hypotension to a mean 50-55 mmHg was induced with intravenous labetalol. Data from these patients were analyzed by determining the correlation coefficient using the Pearson correlation coefficient.

Results: Non-invasive BP measured by the Vasotrac correlated closely with IABP. Waveforms displayed by the two systems were qualitatively similar. The correlation coefficients for systolic, diastolic and mean BP were 0.85, 0.90 and 0.94, respectively (figure).

Conclusions: Our data suggests that the Vasotrac system correlates closely with IABP monitoring in children under normotensive conditions and during pharmacologic-induced hypotension.

References:

1) Belani K, et al. *Anesthesiology* 1999; 91:686-692. 2) Belani K, et al. *Can J Anesth* 1999; 46:488-496.

