

Difference Between Pleth Variability Index Obtained from the Finger and the Forehead.

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Background

The pleth variability index (PVI), which is calculated from respiratory variations in perfusion index (PI), has been reported to predict fluid responsiveness. However, PI, especially at the fingers, is more sensitive to vasomotor tone. Therefore, surgical stimuli might be easy to reduce the accuracy of PVI at the fingers. The aim of this study was to confirm whether the effect of surgical stimuli on PVI depends on the site of measurements.

Methods

The study was conducted on 9 patients (ASA I-II, age 28 to 77 yr) with sinus rhythm and normal left ventricular function after induction of general anesthesia. All patients were anesthetized with sevoflurane and remifentanyl and mechanically ventilated with a tidal volume of 8-10 ml/kg at frequency of 12 cycles per minute. PI and PVI, which were calculated by a Radical-7 pulse oximeter, were recorded at the finger and at the forehead simultaneously before and after the skin incision. Data are expressed as median values and the interquartile range (25%-75%). Changes in variables induced by the skin incision were tested with Wilcoxon signed-rank test. A p value of < 0.05 was considered statistically significant.

Results

After the skin incision, the finger PI decreased significantly and the finger PVI increased significantly, whereas the forehead PI and PVI remained stable (Table 1).

Conclusions

This study showed that the PI and PVI recorded at the fingers were more sensitive to vasomotor tone than those recorded at the forehead. These results suggest that the PVI obtained from the forehead may be more reliable predictor of fluid responsiveness under the conditions in which vasomotor tone varies widely.

	Before the skin incision	After the skin incision	
Finger-PI	5.2 (3.8-6.0)	3.4 (1.5-4.1)	p<0.05
Finger-PVI	9.0 (7.0-10.0)	14.0 (8.0-15.0)	p<0.05
Forehead-PI	1.7 (1.4-2.7)	2.0 (1.5-2.6)	NS
Forehead-PVI	9.0 (5.0-10.0)	8.0 (6.0-11.0)	NS

[Table 1. Changes in PI and PVI]