

Print

Close

A251

October 18, 2008
2:00 PM - 4:00 PM
Room Hall E2-Area K,

FORE-SIGHT® Cerebral Oximeter: A Possible Solution to Methylene Blue Interference

Gregory W. Fischer, M.D., David L. Reich, M.D.
Anesthesiology, Mount Sinai School of Medicine, New York, New York

Introduction: Methylene Blue (MB) is administered in cardiac surgery to patients for treatment of vasoplegic syndrome (VS). VS is a recognized and relatively common complication of cardiopulmonary bypass (CPB).^{[i],[ii]} Hypotension, low systemic vascular resistance (SVR) and increased requirements for fluids and vasopressors are its hallmarks. Despite advancements in patient care, VS is still a significant problem that is associated with an increase in morbidity and mortality.^[iii] The conventional treatment has been hemodynamic support with vasopressors. Although norepinephrine is usually sufficient to restore adequate SVR, vascular tone can be refractory to norepinephrine in certain instances.^[iv] In these cases, MB can be used to increase SVR.

However, the use of MB interferes with non-invasive oximetry monitors. Therefore, patients are at risk of compromised brain oxygenation if MB is being utilized. For example, MB interferes with pulse oximeter measurements. A notable decrease in SpO₂ measured saturation is commonly observed when MB is administered intravenously. This effect is caused by the large spectral absorption peak for MB coinciding with one of two pulse oximeter light source wavelengths (660 nm), causing the low false SpO₂ reading following MB infusion.^{[v],[vi]}

We recently reported that MB interferes with the INVOS cerebral oximeter (Somanetics Corporation, Troy, MI).^[vii] At the onset of MB administration, the regional cerebral oxygen saturation (rSO₂) reading of the INVOS can drop significantly and remain at false low values, rendering the monitor useless when MB is used.

Methods: The FORE-SIGHT® (CASMED, Branford, CT, USA) a new four-wavelength cerebral oximeter has recently become available for routine clinical use. We report on three cardiac cases where the FORE-SIGHT monitor was used during MB administration to determine if MB interferes with the monitor.

Results: Demographics: 3 male subjects (2 Caucasian, 1 African American). Procedure: Patient 1 and 2: Mitral valve replacement. Patient 3: left ventricular assist device implantation. MB dosage: 2mg/kg bolus over 30 minutes, followed by 0.5mg/kg/h for 6 hours. MB administration did not appear to affect SctO₂ measurement made by the FORE-SIGHT cerebral oximeter (Figure).

Conclusion: Our results suggest that the FORE-SIGHT cerebral oximeter can be used to reliably detect brain oxygen desaturation events in cases where Methylene Blue is administered to treat vasoplegic syndrome. These results are preliminary and a more comprehensive study will be performed to thoroughly evaluate the use of the FORE-SIGHT with MB administration.

Figure 1: Recorded SctO₂ values with methylene blue administration timing shown.^{[figure1][i]} *Ann Thorac Surg* 61 (1996) (6), pp. 1714–1720

[ii] *Journal of Thoracic and Cardiovascular Surgery* 1983; 86:845-57

[iii] *Ann Thorac Surg* 77 (2004) (2), pp. 496–499

[iv] *J Thorac Cardiovasc Surg* 1998; 116(6):973—80.

[v] *Anesthesiology*. 1986 Oct;65(4):435-6.

[vi] *Am J Emerg Med*. 1999 Jan;17(1):59-67.

[vii] *Anesth Analg*. 2007 Aug;105(2):549-50.

Anesthesiology 2008; 109 A251

Figure 1

