A NOVEL, NON-INVASIVE METHOD TO ASSESS CLINICAL SEDATION STATES: EXTENDING THE MOAA/S SCORE WITH TRULY NOXIOUS STIMULATION TO IDENTIFY GENERAL ANESTHESIA

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Introduction: To test the hypothesis that general anesthesia is not a singular threshold but is a continuum of central nervous system depression that is dependent on the degree of nociceptive stimulation, this study was designed to develop a new, non-invasive method to assess clinical sedation states.

Methods: Twenty healthy (ASA I and II) adult male and female subjects were exposed to a steady state effect site concentration of fentanyl (0.8 ng/ml) and increasing levels of propofol using target controlled infusion technology. Propofol was initiated at a target of 0.5 µg/ml and was increased by 0.25 µg/ml. At each target, the subject's responsiveness was assessed using MOAA/S (5 awake and alert, 0 general anesthesia determined by non-responsiveness to trapezius squeeze-TS), followed by TES (transcutaneous electrical stimulation). The propofol target was increased until the subject was unresponsive to 50 mA of electrical stimulation. The concentration-effect relationships were analyzed using logistic regression techniques.

Results: The pre-TES MOAA/S scores associated with each propofol level are shown in Figure 1. The concentration-effect relationships and potencies are plotted in Figure 2. Substantially higher propofol concentrations were required to produce unresponsiveness to TES compared to TS.

Conclusions: A continuum can be seen in subjects transitioning from minimal sedation to non-responsive to TES at 50mA. TS does not readily distinguish between deep sedation and general anesthesia. Adding TES to the MOAA/S method increased the dynamic range of the assessments to include truly noxious stimulation, thereby enabling the identification of states more consistent with general anesthesia.

Figure 1

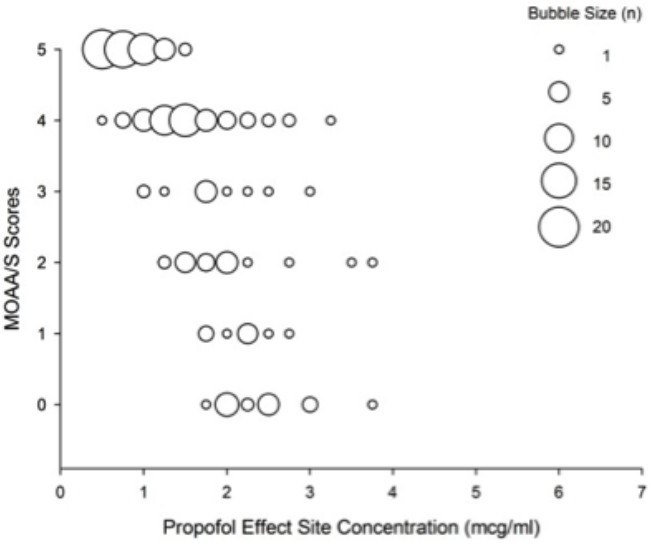

Figure 2