Does the use of AnestAssist improve time to emergence during TIVA Anesthetic during cases with neuromonitoring?

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ABSTRACT

METHODS

With the lack of access to clinically oriented commercially available target-controlled infusions (TCI) or pharmacokinetic simulation programs, the anesthesiologist, in the North America, who is administering a total intravenous anesthetic (TIVA) is at a disadvantage as to the appropriate concentrations of propofol and remifentanil to use to maintain an appropriate surgical plane of anesthesia while achieving a short time to extubation. In the past there have been computer based pharmacokinetic simulation programs, e.g., STANPUMP, IVASIM, or RUGLOOP that allowed simulation and infusion pump control or alternatives to computer based system such as manual slide rule systems. With the advent of the personal handheld device pharmacokinetic simulation programs are now available as plug-in play apps. Now with the proliferation of electronic anesthesiology recent pharmacokinetic simulation programs can be an integrated component such examples are SmartPivot View (Drager Medical, Lubeck, Germany) and Navigator Suite (GE Healthcare, Helsinki, Finland). These programs bring the use of pharmacokinetic simulation programs from the academic setting to the daily clinical setting of the anesthesiologist.

OBJECTIVE

To assess AnestAssist, an application for the iPhone platform created by Mark Palma to predict time to extubation during intracranial procedures. The AnestAssist app utilizes pharmacokinetic models from Schnider and Marsh for propofol and Minto for remifentanil, and interactions/synergism models from Kern.

METHODS

13 patients undergoing intracranial surgery between the ages of 24-79 years old (average of 53 with standard deviation of 17yrs) were randomized to two groups, which were adjusted to maintain a propofol effect site concentration between 2-5µg/ml; and a remifentanil effect site concentration between 2.8-9.5ng/ml. The time to extubation was tracked using our electronic record (PIMS) system.

RESULTS

For the 13 cases where AnestAssist was utilized the average time to extubation from discontinuing the infusion was 16 and 9 min for propofol and remifentanil respectively. The effect site concentration that is calculated by AnestAssist at emergence appears to correlate to the levels noted by Vuyk and Mertens for return of consciousness. To further assess the value of this program on decreasing the time to emergence, a larger patient population is needed.

CONCLUSIONS

For the 13 cases where AnestAssist was utilized the average time to extubation from discontinuing the infusion was 16 and 9 min for propofol and remifentanil respectively. The effect site concentration that is calculated by AnestAssist at emergence appears to correlate to the levels noted by Vuyk and Mertens for return of consciousness. To further assess the value of this program on decreasing the time to emergence, a larger patient population is needed. 2. A blinded anesthesiologist group is needed, and 3. A further assess the value of this program on decreasing the return to consciousness with concentrations of propofol below 2µg/ml and remifentanil below 2ng/ml.

REFERENCES