DRUG INTERACTION DISPLAY DURING BALANCED ANESTHESIA: SMART PILOT VIEW™ PRELIMINARY STUDY

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Introduction: General anesthesia combines hypnotic and opioid to benefit from their synergism and control responses to noxious stimulations. But the equilibrium between both drugs may be difficult to find, especially because no predictive measure of their combined effect is available. Recently, Draeger Medical developed a 2-D and time trends display, called Smart Pilot® View, which superimposed the predicted concentration of both drugs, a composite index based on both concentrations (the Noxious Stimulus Response Index) with the probability of response to standardised stimulation as verbal command, incision or laryngoscopy estimated from literature. Lower is NSRI, smaller is the probability of response. The purpose of this pilot study was to assess the relevance of SPV and NSRI in various clinical contexts.

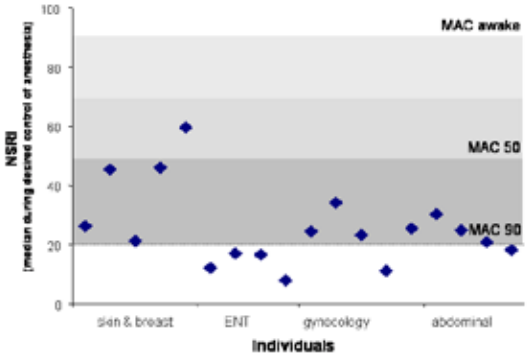

Figure 1

Methods: SPV display was connected to a Zeus anesthesia machine as well as syringe pumps for Zeus-controlled intravenous opioid infusion.

After informed consent, 19 adult patients were included in this descriptive study. They all received a balanced anesthesia combining desflurane with remifentanil. Both drugs were adjusted on BIS, hemodynamics and movement but SPV display was visible for the team and recorded continuously.

Monitoring and drug dosing were examined retrospectively. Correlation was calculated between responses to intubation or incision (MAP, HR or BIS) and NSRI value prior the stimulation. During surgery, NSRI and predicted drug concentrations were extracted only when BIS was in a 40-60 range and MAP within ± 20% from a preoperative reference value, called desired anesthetic control.

Results: MAP response to intubation or incision was significantly correlated with preintubation NSRI ($p<0.05$).[figure1]. During surgery with desired anesthetic control, median NSRI was higher for peripheral than for ENT or abdominal surgery, although the number of patients was insufficient for statistical evaluation [figure2].

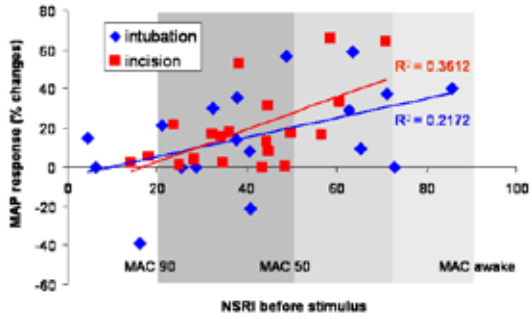

Figure 2

No similar trend could be distinguished in the predicted concentrations of each single drug.

All investigators appreciated the SPV display to adjust one or the other anesthetic drug in case of non desired anesthetic control (BIS or BP out of desired range).

Discussion: Smart Pilot® View may be useful to assess the expected effect of hypnotic-opioid combination and guide drug delivery during balanced anesthesia. The values to recommend (or the position on the display) should be validated for different drug combinations, types of surgery and age ranges.