Anesthesiology
V 75, No 3A, Sep 1991

## A1025

The EEG does not predict movement in response to surgical incision at 1.0 MAC isoflurane.

R Dwyer, I Rampil, EI Eger II, HL Bennett*.

Dept of Anesthesia, University of California, San Francisco, CA 94143.
*Dept of Anesthesia, University of California, Davis, CA 95817.

We examined whether the electroencephalograph (EEG) can predict if a patient will move in response to surgical stimulation [1].
METHODS In 18 healthy patients (aged 26-58 yrs) undergoing elective surgery, we induced anesthesia with isoflurane in nitrous oxide and oxygen, supplemented in 8 cases by propofol (1.2±0.4 mg/kg; mean dose±SD). After vecuronium 0.08 mg/kg, the trachea was intubated, ventilation adjusted to provide normocarbia and anesthesia maintained with isoflurane alone (in $O_2$). Power spectrum EEG analyses for 2 pairs of leads ($Fp_1$-$T_3$, $Fp_2$-$T_4$) were performed with a microcomputer (Macintosh SE, Apple Computer) in 4 sec epochs. Minimum durations for anesthesia and for 1.0 MAC anesthesia before surgical incision were 30 and 10 min respectively. Before incision all subjects had four equal twitches from train-of-four stimulation. Five EEG variables were analyzed for a 16 sec period immediately before surgical incision and compared between patients who did and did not move in response to surgical stimulation (unpaired T test, Bonferroni's correction).
RESULTS All 5 EEG variables were stable with small inter- and intra-subject variances. Ten patients moved with incision; eight did not. No EEG variable differed significantly between movers and non-movers (Fig.1).

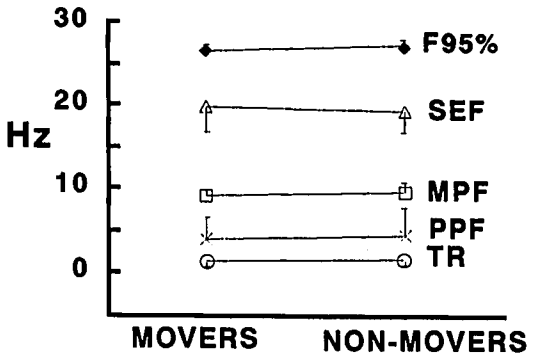


Fig.1. The EEG did not predict which patients would move at incision at 1.0 MAC isoflurane anesthesia. F95=spectral edge frequency for 95% of power;SEF=the highest frequency with significant power;MPF=median power frequency; PPF=peak power frequency; TR=ratio of theta band power to total power (means ± SD).

CONCLUSION At 1 MAC isoflurane, the EEG does not predict whether a patient will move in response to surgical incision.
1.Anesthesiology 1990;73:A532.

## A1026

TITLE : EEG SPECTRAL ACTIVITY : AN OBJECTIVE INDEX OF POST OPERATIVE PAIN IN INFANTS.
AUTHORS : Ph. MEYER M.D., P. JAYAIS M.D., A. BENSOUDA, M.N. MAYER M.D., G. BARRIER M.D.
AFFILIATION : Hopital des Enfants Malades 75015 PARIS FRANCE

Pain evaluation remains a difficult problem in infants based on subjective behavorial reactions (1). Clinical pain score are frequently badely correlated with changes in objective parameters such as blood pressure or heart rate (2). We took the opportunity of monitoring peroperative brain function to correlate a previously described pain score (2) with changes in EEG spectral activity.

After ethical approval and parents consent 18 infants (20 days to 7 months old) referred for short procedures performed either under light halothane anesthesia associated with caudal anesthesia (group A) or deep halothane anesthesia alone (group B) were studied. Pain scores were determined every 30 minutes for 120 minutes. Continuous EEG spectral activity was monitored using Life Scan ®. Spectral edge frequency (SEF) and frequencies distribution were analyzed. Statistical analysis used unpaired T-test and Anova.

As could be expected pain scores differed significantly between the 2 groups at 30, 60 ans 90 minutes. with higher scores in group A. No significant difference was noted at arrival to the recovery room and after 120 minutes Wide individual variations were noted in EEG spectral activity. However a pain score of 15 or more indicating good pain relief was significantly associated with augmentation of total EEG amplitude especially in the slow frequency range ($p < 0.05$). With a score of 10 or less a built up beta$_2$ activity was noted ($p < 0.0001$). SEF did not contribute to evaluation because of frequent bimodal distribution.Using a reproducible clinical pain score, we found a significant correlation between clinical evaluation and EEG high frequency activation indicating cerebral excitation. We did not find significant correlation with other objective indexes such as heart rate or blood pressure values.

It can be concluded that EEG spectral activity could add an objective index of pain evaluation in infants and needs further evalutation.

References : 1) Pain 31 147-176 1987.
2) Intensive Care Med 15 S 37-39 1989.