

Are induction of anesthesia and recovery from anesthesia mirror image?

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The relation between consciousness and EEG patterns has been extensively studied, and it is clarified that changes

of EEG correlate well with anesthetic effect. Usually, anesthesia is considered to be a reversible phenomenon. Then, the question is whether the changes in the brain anesthesia mirror each other during induction and recovery, or not.

When the propofol blood concentration (and hence C_e ; effect-site concentration) was gradually increased and decreased, pattern sequences of raw EEG during induction and recovery, for propofol, showed symmetry. Iwakiri, et al. have shown in their volunteer study that C_e of propofol at loss of consciousness is virtually identical to that recovery of consciousness. These facts indicated that induction and recovery from propofol anesthesia would be symmetrical processes based on the reversal mechanism.

Flaishon, et al. have reported that BIS transiently decreased to 20-30 after bolus administration of propofol 2 mg/kg. After the transient drop of BIS, it increased again, after which the patients regain consciousness. This change of BIS seemed reasonable, but change of raw EEG is quite specific. Just after loss of response large delta wave emerged. Such waveform never be observed when anesthesia was slowly induced. This phenomenon might be due to transient inhomogeneous distribution of anesthetic in the brain.

Finally, induction and recovery from anesthesia seemed symmetric except for rapid induction.