

ADAPT-2: A Randomized Clinical Trial to Reduce Intraoperative EEG Suppression in Older Surgical Patients Undergoing Major Noncardiac Surgery

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BACKGROUND:

Recent limited evidence suggests that the use of a processed electroencephalographic (EEG) monitor to guide anesthetic management may influence postoperative cognitive outcomes; however, the mechanism is unclear.

METHODS:

This exploratory, single-center, randomized clinical trial included patients who were ≥ 65 years of age undergoing elective noncardiac surgery. The study aimed to determine whether monitoring the brain using a processed EEG monitor reduced EEG suppression and subsequent postoperative delirium. The interventional group received processed EEG-guided anesthetic management to keep the Patient State Index (PSI) above 35 computed by the SEDline Brain Function Monitor (Masimo, Inc, Irvine, CA), while the standard care group was also monitored, but the EEG data were blinded from the clinicians. The primary outcome was intraoperative EEG suppression. A secondary outcome was incident postoperative delirium during the first 3 days after surgery.

RESULTS:

All outcomes were analyzed using the intention-to-treat paradigm. Two hundred and four patients with a mean age of 72 ± 5 years were studied. Minutes of EEG suppression adjusted by the length of surgery was found to be less for the interventional group than the standard care group (median [interquartile range], 1.4% [5.0%] and 2.5% [10.4%]; Hodges-Lehmann estimated median difference [95% confidence interval {CI}] of -0.8% [-2.1 to -0.000009]). The effect of the intervention on EEG suppression differed for those with and without preoperative cognitive impairment (interaction $P = .01$), with the estimated incidence rate ratio (95% CI) of 0.39 (0.33–0.44) for those with preoperative cognitive impairment and 0.48 (0.44–0.51) for those without preoperative cognitive impairment. The incidence of delirium was not found to be different between the interventional (17%) and the standard care groups (20%), risk ratio = 0.85 (95% CI, 0.47–1.5).

CONCLUSIONS:

The use of processed EEG to maintain the PSI >35 was associated with less time spent in intraoperative EEG suppression. Preoperative cognitive impairment was associated with a greater percent of surgical time spent in EEG suppression. A larger prospective cohort study to include more cognitively vulnerable patients is necessary to show whether an intervention to reduce EEG suppression is efficacious in reducing postoperative delirium.