Electroencephalogram alone cannot save lives.

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Argomento: Anestesia generale

Introduction: Recently, Wildes et al reported a reduced mortality in electroencephalogram (EEG) guided general anesthesia, compared to usual care group. (4/614 vs 19/618, $P = 0.004$) [1]. We wondered if this result is a consistent signal of reduced mortality in EEG guided anesthesia or not.

Method; We searched Pubmd and Embase, dated up to Feb. 2019, and retrieved randomized controlled trials of EEG guided anesthesia reporting mortality data.

Result: Nine studies were included. Overall data showed no difference in mortality. (Figure 1) When dividing the studies into those which showed any differences in the EEG parameters or anesthetics consumption, and those which did not (Table 1) we found a mortality reduction only in the subgroup of patients which showed difference. Sensitivity analyses didn’t change the result.

Conclusion: This result may indicate that EEG guidance itself would not improve survival, but EEG guided reduction of anesthetic depth improves survival.

References

1. Wildes TS, Mickle AM, Ben Abdallah A, et al. Effect of Electroencephalography-Guided Anesthetic Administration on Postoperative Delirium Among Older Adults Undergoing Major Surgery: The ENGAGES Randomized Clinical Trial. *JAMA*. 2019;321(5):473-483. doi:10.1001/jama.2018.22005

Figure 1. Forest plot of mortality in electroencephalography guided anesthesia versus control

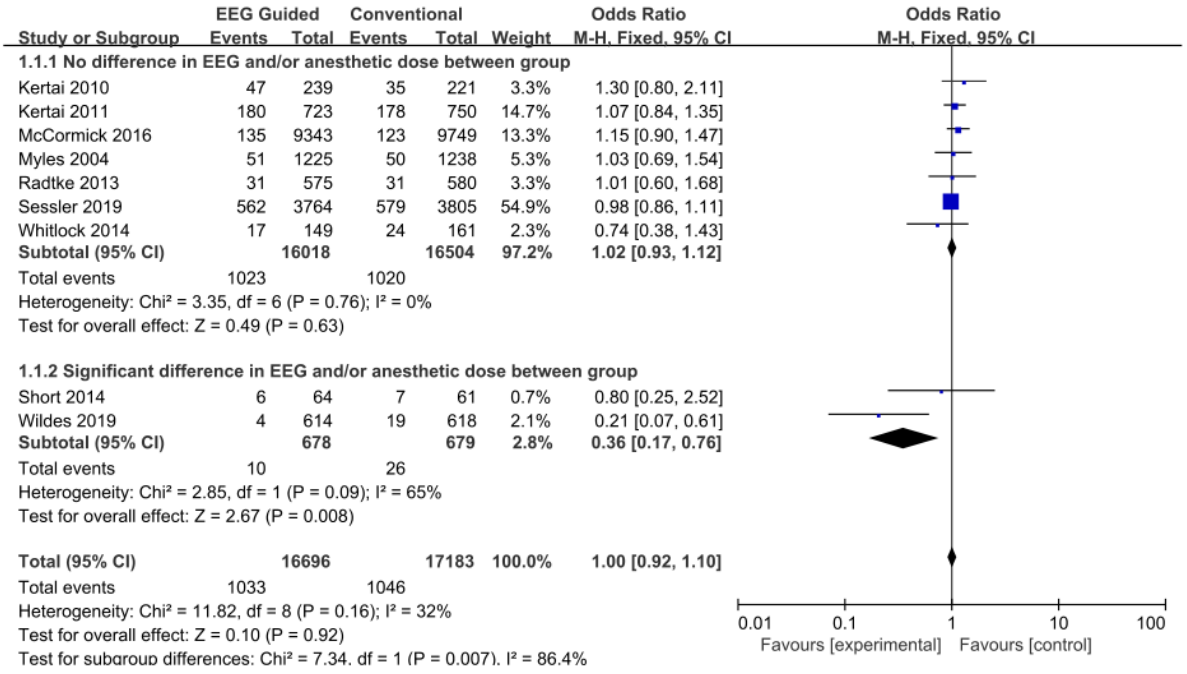

Table 1. Characteristics of included studies

First author and published year	Type of anesthesia	BIS or MAC		*P* value	Study identifier	Population
		EEG guided	Control			
Kertai 2010	Inhalation agents	Not reported. But in the main RCT, no difference in BIS or MAC		0.51(BIS), 0.10(MAC)	Substudy of B-Unaware†	High risk of awareness, Cardiac surgery
Kertai 2011	Inhalation agents	42.9 ± 8.0	43.3 ± 9.4	0.50	Substudy of B-Unaware	High risk of awareness, Noncardiac surgery
McCormick 2016	TIVA 20.7%/21.0 %	Not reported, but values after double low event are similar				Adult elective non cardiac surgery
Myles 2004	TIVA 43%/42%	BIS N/A* MAC 0.57 (0.43-0.72)	MAC 0.61 (0.43-0.78)	0.169	B-Aware	High risk of awareness
Radtke 2013	TIVA 31.0%/25.7 %	39.0 ± 7.2	38.7 ± 7.4	0.472	N/A	Older than 60 yrs, general anesthesia expected to last> 60min

Sessler 2019	Inhalation agents	N/A, but similar portion (75%) showed no change of MAC after triple low event				Non cardiac surgery adult patients using inhalation anesthetics
Whitlock 2014	Inhalation agents	N/A, but proportion of intraoperative time with BIS<20 was not different		0.88	Substudy of BAG-RECALL†	High risk of awareness
Short 2014‡	TIVA 9%/7%	0.64 (0.59 to 0.69) 48 (46 to 49)	0.98 (0.92 to 1.05) 39 (38 to 41)	<0.001 <0.001		>= 60years, ASA III or IV, G/A >2hrs, expected hospital stay >=2 days
Wildes 2019	Inhalation agents	0.69 (0.62 to 0.77)	0.80 (0.71 to 0.86)			>= 60years major surgery with G/A

EEG monitors were bispectral index in all studies. TIVA; total intravenous anesthesia, BIS; bispectral index, N/A; not available, MAC; minimum alveolar concentration, *; BIS was turned off in control group, †; B-Unaware and BAG-RECALL study didn't report mortality, ‡; Control group of this study aimed to maintain BIS lower(35) than study group(50).