The choice of anesthetic agent does not predict the occurrence of postoperative delirium in cardiac surgery: A prospective observational study

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Background and goal of the study

Postoperative delirium (PD) in cardiac surgery patients is a major problem and results in increased morbidity. Studies have suggested that a sevoflurane-based anesthesia was better associated with short-term cognitive function than propofol.¹ We sought whether the choice of the anesthetic agent could influence the incidence of PD in a cohort of patients undergoing all types of cardiac surgery with or without cardiopulmonary bypass.

Material and methods

This is a sub-analysis of a large prospective observational trial evaluating the neurologic outcome of adult patients undergoing cardiac surgery (NCT 02006212). A total of 1500 patients will be included for the purposes of the study. In all patients cerebral oxygen saturation (ScO₂) is measured before the induction of anesthesia. Subjects are evaluated for PD during the entire hospital stay. At the ward, the evaluation is performed every 4 to 6 hours. No standard screening tests are used. However, signs and symptoms of hypoactive, hyperactive and mixed delirium are actively searched.

Data are expressed in median (P25-P75) or numbers and percentages. A Mann-Whitney and Chi square tests are used to compare respectively continuous and dichotomous variables between both groups. A binary regression analysis was performed to predict PD. The type and the total dose of anesthetic agents were considered as independent variables. P < 0,05 is considered significant.

Results and discussion

In total 620 patients were analyzed. PD occurred in 20% of the patients.

Table 1: Characteristics and data of patients with or without PD

	PD (N=126)	No PD (N=494)	P
Age (Years)	74 (64-80)	67 (57-75)	< 0,001
	1,93	1,67	
EuroSCORE II	(1,08 – 3,64)	(0,94 – 3,13)	0,013
Male/female	84/42	353/141	0,383
Mean baseline ScO₂ (%)	61 (56-67)	63 (56-69)	0,013
Left baseline ScO₂ (%)	60 (54 -66)	62 (56 – 69)	0,046
Right baseline ScO₂ (%)	60 (56 – 67)	64 (56 – 69)	0,008
Surgery on left sided cavities	87 (69%)	321 (65%)	0,54
Sevoflurane	84 (67%)	322 (65%)	0,84
Midazolam	121(96%)	477 (97%)	0,04
Total dose midazolam per weight (mg/kg)	0,048 (0,033-0,060)	0,048 (0,034-0,058)	0,82
Ketamine	106 (84%)	443 (65%)	0,01
Total dose Ketamine per weight (mg/kg)	0,36 (0,24 -0,48)	0,38 (0,26 – 0,47)	0,55

Table 2: Predictive factors of PD

Variables	P value	Odds Ratio	95% CI for OR
Mean baseline ScO₂	0,309	0,989	0,967-1,011
Sevoflurane	0,691	0,911	0,576-1,441
Dose ketamine/weight	0,228	0,443	0,118-1,665
Dose midazolam/weight	0,339	151	0,0005-4434973
Surgery on left sided cavities	0,855	1,042	0,668-1,628
Age	0,000	1,039	1,021-1,058
EuroSCORE II	0,485	1,021	0,962-1,084

The Hosmer and Lemeshow test showed a chi-square statistic of 6,855 with P = 0,552.

Data are expressed in median (Percentile 25 – Percentile 75)

Conclusions

This is the first large prospective study evaluating the impact of the anesthetic regimen on the incidence of PD. Our preliminary results show that

1. The choice of the anesthetic agent does not influence the incidence of PD in cardiac surgery patients.
2. Age remains the only independent predictor of PD.

References

1. SchoenJ et al. BJA 2011; 106: 840-845