ORIGINAL RESEARCH

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Changes of autonomic tonus of the heart during induction of general anesthesia with two intravenous anaesthetics

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Abstract

Background: Induction of general anesthesia with midazolam or thiopental is often associated with cardiovascular changes.

Material and methods: The study group involved 94 patients. The analysis of heart rate variability and the changes in cardiac vegetative tonus was performed after premedication with fentanyl solution and after induction of general anesthesia with midazolam combined with fentanyl (midazolam group) or thiopental combined with fentanyl (thiopental group).

Results: After administration of fentanyl in doses of 1.0 mkg/kg for premedication there were no significant changes of heart rate variability and vegetative heart tonus in both groups. Administration of midazolam 0.2-0.3 mg/kg combined with fentanyl 1.0 mkg/kg for induction of general anesthesia leads to a significant reduction of heart rate variability. The LFun (marker of sympathetic heart tonus) reduced by 24.2% (69.1 (95%CI 65.9-72.3) vs 52.4 (95%CI 42.9-70.0) (p=0,02), meantime the HFun (marker of parasympathetic cardiac tonus) enhanced by 34,9% (30,9 (95%CI 27.6-34.1) vs 47.5(95% CI 30.4-57.4) (p=0.01). Administration of thiopental 6.0-7.0 mg/kg combined with fentanyl 1.0 mkg/kg for induction of general anesthesia leads to a significant reduction of heart rate variability.

Conclusions: Administration of fentanyl solution in doses 1.0 mkg/kg for premedication is not associated with significant changes of vegetative tonus of the heart. Administration of midazolam in combination with fentanyl for induction of general anesthesia leads to significant decrease of heart rate variability and enhanced parasympathetic cardiac tonus. Induction of general anesthesia with thiopental and fentanyl leads to enhanced sympathetic tonus of the heart.

Key words: heart rate variability, sympathetic heart tonus, parasympathetic heart tonus.