AGE-DEPENDENT ACTIONS OF SEVOFLURANE ON HEART RATE VARIABILITY

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INTRODUCTION

The degree of autonomic control of the cardiovascular system decreases with age. However, the actions of anesthetic agents have not been described on the autonomic function in elderly patients. The objective of the present study was to determine the effects of sevoflurane on the Autonomic Nervous System (ANS) activity in both young and elderly patients.

METHODS

Five young and five elderly unpremedicated neurosurgical patients consented for the study. During stable surgical stimulation, body temperature and ETCO_2 , every patient successively received two MAC concentrations of sevoflurane (0.5 & 1 MAC) in O_2/Air mixture ($\text{FiO}_2=0.5$). Heart rate variability (HRV) analysis was used to determine the ANS function showing a characteristic power spectrum with two main regions, a high frequency band (HF: 0.15-0.4Hz) and a low frequency band (LF: 0.04-0.15Hz). The HF component is mediated solely by parasympathetic function while the LF component reflects the effects of both sympathetic and parasympathetic nerve activity. LF/HF is the ratio of the integrated power at the low (LF) and high (HF) frequency bands.

RESULTS

The mean ($\pm$ S.D.) age and weight of consented patients were 44.14 ± 9.59 yrs and 84.39 ± 12.4 kg for the young group and 75.14 ± 9.59 yrs and 74.39 ± 12.4 kg for the elderly. The figure below shows a scatter diagram for the actions of sevoflurane on LF/HF ratio. Mean and S.D. are indicated by the horizontal and vertical bars respectively.

DISCUSSION

These preliminary data suggested that the effects of sevoflurane are age-dependent. The age dependency of the actions of anesthetic agents and techniques on ANS function has to be elucidated for better perioperative hemodynamic control in the elderly.