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INTRODUCTION

The MAC value of a volatile anaesthetic is based on movement reactions and may mainly reflect effects on the spinal cord. Therefore, EEG burst suppression MAC (MAC_{BS}) has recently been suggested as a measure of anaesthetic effects on the brain [1]. The present study was performed to evaluate the influence of different doses of Remifentanil (R) on MAC_{BS} of Sevoflurane (Sevo).

METHODS

After approval from the ethics committee and informed written consent, unpremedicated patients were randomly assigned to receive one of five infusion rates of R (R0 = control group, 0 μ g/kg/min; R05 = 0.05 μ g/kg/min; R1 = 0.1 μ g/kg/min; R2 = 0.2 μ g/kg/min; R4 = 0.4 μ g/kg/min). MAC_{BS} was determined using Dixon's "Up and Down" method:

With Sevo mask induction, patients received a pre-determined concentration of Sevo.

If burst suppression occurred after a 15 min equilibration, Sevo concentration of the next patient in this group was reduced by 10%.

If the EEG did not show burst suppression, Sevo concentration of the next patient was increased by 10%. In each group, measurements were performed until six independent crossover pairs (i.e. two subsequent patients with and without EEG burst suppression) occurred.

MAC values in each group were calculated using logistic regression.

RESULTS

MAC_{BS} of Sevo was 2.98. In R groups, MAC_{BS} was increased (R05: 4.25, R1: 3.81, R2: 4.39, and R4: 4.52).

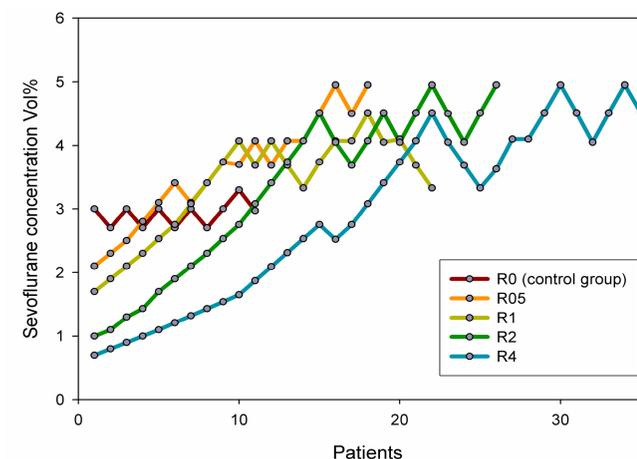


Figure 1: Dixon's Up and Down for each group, showing the Sevoflurane concentration needed to induce BS. The graph shows - in contrast to our expectation - that Remifentanil did not reduce MAC_{BS} of Sevoflurane.

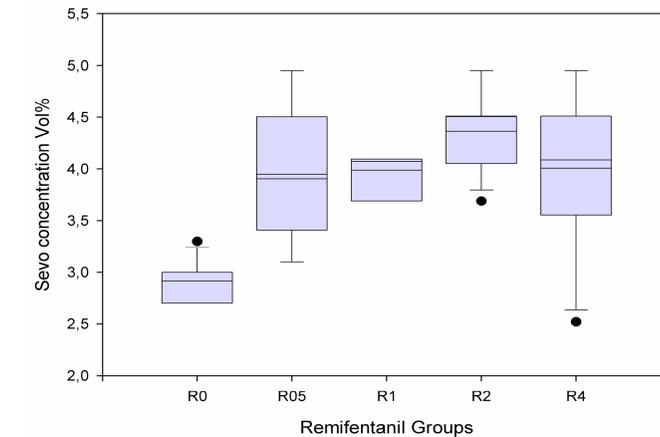


Figure 2: Box plots of the mean value of the cross-over pairs in each Remifentanil group.

DISCUSSION

Reduction of MAC (skin incision) by R may mainly reflect spinal and peripheral effects, while MAC_{BS} is not reduced by R. In contrast to expectations, there was no synergistic effect of R on MAC_{BS} . The increase of MAC_{BS} by R may be due to a reduction of external input, reduction of excitatory effects of Sevoflurane, or an increased resistance against state transitions.

REFERENCE

[1] Pilge S. et al.: Brit J Anaesth 2014