

tional and Kapodistria



ABSTRACT

The selection of anαesthetic medications for both induction and maintenance in the context of neurosurgery with MEP (Motor Evoked Potentials) monitoring requires thoughtful deliberation. Propofol is often favored for induction due to its rapid onset and smooth emergence, while inhalational agents such as sevoflurane or desflurane are commonly used for maintenance as they offer good control over the depth of anesthesia.

The aim of this research was to contrast the impact of sevoflurane or propofol, combining with Remifentanil, on Motor Evoked Potentials (MEPs) and Corticobulbar MEPs under equivalent levels of anαesthesia depth, as monitored by the bispectral index (BIS).

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INTRODUCTION

Intraoperative neurophysiological monitoring has been demonstrated to alert the surgical team for potential injury.

The purpose of this study was to compare the effects of sevoflurane and propofol combined with Remifentanil on Transcranial electric Motor-Evoked Potentials (TceMEPs) and Corticobulbar MEP's and during comparable depth of anaesthesia, guided by bispectral index (BIS).

METHODS

Selection of patients: scheduled craniotomy for resection or partial removal of brainstem tumours

The patients were divided in two groups. Group receiving sevoflurane : **GrS n=20** & Group receiving propofol : **GrP n = 20.**

G.A. induction in both groups using: propofol 2 mg/kg fentanyl 1mcg/kg rocuronium 0,6mg/kg

G.A. maintenance remifentanil: 0.25-0.35 µg/kg/min GrS : Sevoflurane 1,5% GrP: 6 mg/kg/hr BIS monitoring in both groups: 35-45

The influence of anaesthesia on intraoperative motor evoked potential changes during Neurosurgery.

RESULTS

- The amplitudes of TceMEPs were significantly higher in the GrP than those in the GrS (p<0.05) at all study points.
- The latencies were shorter in the GrP than those in the GrS $(135\pm15 \text{ vs } 165\pm22)$, p<0.05) at all study points.
- No differences were recorded in latency and amplitude while recording SSEPs between the two Groups.

METHODS

Neuromonitoring

Recordings were carried out in: MEP's The abductor pollicis brevis

The abductor hallucis

Corticobulbar MEP's

masseter orbicularis oculi and oris Mentalis Cricothyroid, vocalis, tongue muscles. **SSEPs** Cortical and peripheral: Median and posterior tibial nerve stimulation.

Amplitudes and latencies of MEPs & SSEPs were recorded at 30, 60, 90 and 120 minutes after the induction of anaesthesia.

DISCUSSION

Several factors can influence the monitoring of MEPs (Motor Evoked Potentials) during neurosurgery. These factors include low blood pressure, hypo- or hyperthermia, hypercapnia, hypoxemia, severe anemia, and elevated intracranial pressure (ICP). These factors can result in misleading indications of nerve damage, such as increased latency and decreased amplitude of MEPs.

The selection of anaesthetic medications for the initiation and maintenance of anaesthesia should be carefully considered, as they can impact both the amplitude and latency of motor potentials.

Although propofol appears to be a more preferable option, it is essential to also take into account the influence of anaesthesia depth and blood pressure in future research endeavors.



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CONCLUSIONS

Anaesthesia with propofol has more favorable effects than Sevoflurane during the monitoring of TceMEPs under comparable BIS levels.

MEPs are exquisitely sensitive to inhalational agents.

> Bad neuromonitoring is worse than no neuromonitoring



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