Comparison of Intraoperative Brain Condition, Hemodynamics and Postoperative Recovery Between Desflurane And Sevoflurane In Patients Undergoing Supratentorial Craniotomy.

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ABSTRACT

- **OBJECTIVE**: To compare the postoperative recovery between desflurane & sevoflurane in patients undergoing supratentorial craniotomies.

- **METHODS**: Fifty three patients (18-60yr) undergoing elective supratentorial craniotomy randomized into group S (Sevoflurane) or group D (Desflurane) and received 0.8-1.2 MAC of either desflurane or sevoflurane with N₂O and oxygen. Subdural ICP was measured and brain condition was assessed using a 4-point scale. Recovery characteristics, vitals, post operative complication were recorded. Cognitive behaviour [evaluated with Short Orientation Memory Concentration Test (SOMCT)] and neurological outcome at the time of discharge [assessed with Glasgow Outcome Scale (GOS)] were compared between the two groups.

- **RESULTS**: The emergence, extubation and recovery times and SOMCT scores were similar between the two groups. The two groups had similar mean ICP, brain condition, intraoperative and post operative vitals, post operative complications and neurological outcome.

- **CONCLUSIONS**: Patients undergoing elective supratentorial craniotomy receiving sevoflurane or desflurane had similar intra- operative brain condition, hemodynamics and post operative recovery profile.

BACKGROUND

- Post operative recovery is reported to be faster with desflurane than sevoflurane anaesthesia.
- Desflurane is often criticized in neurosurgery due to the concerns of cerebral vasodilatation and increase in ICP.
- Studies directly comparing recovery after desflurane & sevoflurane are scarce.

OBJECTIVE

- **Primary objective**: To compare the intraoperative and recovery characteristics, Glasgow outcome scale (GOS) of the patients.
- **Secondary objective**: To compare the intraoperative brain condition, intra and post operative hemodynamics, postoperative complication & neurological outcome on discharge between the two agents.

METHODS

- 53 patients (18-60yr) for elective supratentorial craniotomy randomized into group S (Sevoflurane) & D (Desflurane) [Figure 1].
- Short Orientation Memory Concentration Test (SOMCT) score noted.
- Anesthesia induction: fentanyl+propofol+ vecuronium, Maintenance:0.6 N₂O:D₂O=1:0.8-1.2 MAC des./sevo.+ vecuronium
- Flow rate @ 2 l/min & PaCO₂ maintained @30±2 mm Hg.
- Pin sites infiltrated with bupivacaine & IV mannitol (1g/kg) given.
- Subdural ICP measured using a 20G cannula placed in subdural space & connected to a transducer placed at mastoid process level.
- Brain condition assessed on a 4-point scale: 1: perfectly relaxed; 2: satisfactory relaxation; 3: firm brain; and 4: tight brain.
- Change in position, further PaCO₂ & additional mannitol ± furosemide administered when brain condition was of grade 4.
- Sevo./Des. tapered at skin suturing and stopped after skin dressing.
- Vitals recorded as baseline, post induction, intubation, post intubation, at pin application, at 15mins interval till tapering of des./sevo. & then at 1min interval till 10mins after tracheal extubation.
- All patients received ondansetron & paracetamol.
- Hypotension ± Tachycardia — [Sevo/Des up to 1.2MAC — fentanyl —proparacaine] (Figure 2).
- Hypotension ± Sevo/Des upto 0.8MAC ± IV fluid — mephentermine.
- Labetolol & atropine for emergence HTN & bradycardia respectively.
- Emergence time: Time anesthetic discontinuation — eye opening.
- Extubation time: Time anesthetic discontinuation — extubation.
- Recovery time: Time anesthetic discontinuation — ability to recall name and date of birth.
- Postoperatively (3hrs) vitals recorded at 15mins interval and SOMCT evaluated at every 15mins for first hour & then half hourly for next 2h.
- Neurologic outcome assessed with Glasgow outcome scale (GOS).

RESULTS

- In patients undergoing elective supratentorial surgery there is no difference in post operative recovery, intraoperative brain condition, hemodynamics and post operative hemodynamics and post operative recovery between sevoflurane and desflurane.
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CONCLUSION

Table1. Patient characteristics & anesthetic details

Table2. Intraoperative and recovery characteristics, hospital & ICU stay & Glasgow Outcome Scale (GOS) of the patients.