

## **COMPARISON OF ASLEEP AWAKE ASLEEP (AAA) TECHNIQUE/ MONITORED ANAESTHESIA CARE (MAC) TECHNIQUE FOR AWAKE CRANIOTOMY**

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**BACKGROUND:** Awake craniotomy is an important technique used for Brain tumor excision from eloquent cortex, Epilepsy foci removal surgery, Deep brain stimulation, Less commonly for mycotic aneurysms, A-V malformation near cortical areas. **AIMS AND OBJECTIVES**

Maintaining patients cooperation by provision of optimal analgesia, sedation, anxiolysis and comfortable position, Achieving homeostasis with safe airway, adequate ventilation and hemodynamic stability., Ensure minimal interference with electrocorticographic recording during mapping. To show the feasibility of dexmedetomidine and scalp block with 0.5% bupivacaine for cortical mapping.

**Material methods** in both group Dexmedetomidine infusion & scalp block given

In group A: l-gel 2nd generation LMA for airway management after inj propofol 2 mg/kg

In group B: Nasopharyngeal airway for same

**Observations:** group A better airway management & less complications

**Conclusion:** AAA method is superior than MAC method.

### INTRODUCTION

Awake craniotomy is popular since 2 decades. It is usually performed for epilepsy surgery, temporal lobectomy, which encroaches eloquent cortex, motor, speech areas, Deep brain stimulation, for AV malformation which needs intraoperative functional testing, Cortical mapping, which requires patient to be awake. Main advantage of awake surgery is to define limits of resection & avoid Postoperative neurological deficits.

## **MATERIAL AND METHODS:**

- 30 adult patients with mass near the eloquent area with ASA grade I & II, Age group 18 to 60 years were selected for awake craniotomy. Patients were informed in detail about procedure. Proper counselling of each patient done. After giving informed consent Scalp block was given with 0.25% bupivacaine blocks supraorbital, supratrochlear, zygomaticotemporal, Auriculotemporal, greater & lesser occipital, greater auricular nerves for better analgesia.

## **PREMEDICATION**

- INJ. Glycopyrrolate 0.04 mg/kg, INJ. Ondansetron 0.08 mg/kg,
- INJ. Fentanyl 1 mcg/kg were given Intravenously.
- Benzodiazepine premedication was avoided because of its residual sedative and amnesic effects during intra operative assessment phase.
- O<sub>2</sub> mask was applied with O<sub>2</sub> flow 4L/MIN. Urinary catheter was inserted for patients comfort for long operative procedure and for diuretic administration. INJ. Cefazolin 1gm was given for infection prophylaxis.
- After premedication, INJ. Dexmedetomidine 1 mcg/kg (Loading dose) Intravenously given over 10 minutes. At the same time scalp block was given by using Bupivacaine 0.25% max. 30 ml

In GROUP A: patients were managed by ASLEEP AWAKE ASLEEP technique in following manner.

Before induction patients were pre oxygenated with 100% O<sub>2</sub> for 3 minutes.

- patients were induced by INJ. PROPOFOL 2.5 mg/kg intravenous dose. After induction, 2nd generation LMA (Igel) no. 3 for female patients and no. 4 for male patients was inserted, cuff inflated, bilateral air entry checked and after confirming air entry Igel was fixed patients were put on spontaneous plus assistance mode on ventilator. Of Dräger Fabius GS work station
- With Igel Etco<sub>2</sub> sample line was attached to monitor Etco<sub>2</sub> intra operatively.

## **Patients were maintained by**

- By Igel O<sub>2</sub> (2l/min) + N<sub>2</sub>O (2l/min) + Sevoflurane (0.5-2%) was started.
- Dexmedetomidine infusion was started at the rate of 0.5 mcg/kg/hr.

In GROUP B patients were managed with Monitored Anaesthesia care (MAC) technique by following manner

Dexmedetomidine loading dose of 1 mcg/kg followed by infusion of 0.5 mcg/kg/hour. Nasopharyngeal airway inserted and oxygen was attached to it with flow of 3-4 liters/min, EtCO<sub>2</sub> sample line attached.

**POSITION:**

- Patients were positioned in RIGHT OR LEFT LATERAL position according to site of lesion.
- SNIFFING position was achieved to help facilitate and patent airway.
- A tent was made under the drape to allow direct communication with patients.

**INTRA OPERATIVE PERIOD:**

- After position, operation was started and surgeons were told to inform 15 min before the craniotomy was expected to over.
- All inhalational agents were stopped in group A, laryngeal mask airway was removed and dexmedetomidine infusion was reduced to 0.3 mcg/kg/hr. In both groups.
- Within 15 to 25 minutes after stopping inhalation agent patients were awake, conscious, and comfortable.
- Patients were put on nasal prongs with O<sub>2</sub> flow 3 l/min.
- Intraoperative awareness was assessed by PRST score. BIS was only available for 5 patients of AAA & 5 patients of MAC technique. It was managed between 60-70.
- After patients were fully awakened,

When neurosurgeon performed speech testing and cortical mapping patients remained alert and oriented throughout the awake portion without speech impairment. Patients were watched for convulsion, respiratory depression and vitals.

- Dexmedetomidine infusion was increased to 0.5 mcg/kg/hr after the resection of tumour. Remaining surgery was conducted with same rate. At the time of skin closure, Dexmedetomidine infusion was stopped and patients were awakened, oriented, following verbal commands before dressing.

- After monitoring for 30 minutes patients were shifted to postoperative.
- Postoperative course of patients was noticed in form of vitals, complications, mean hospital stay
- At least patient satisfaction score & surgeon satisfaction score noticed.

## RESULTS

- Patients Etco<sub>2</sub> remain within limit ranging from 26 to 32 mm of Hg during entire operation in group A. In group B ETCO<sub>2</sub> was slightly elevated. 4 patients of B group developed shortness of breath, anxiety they were converted into full general anaesthesia due to hypercapnia 46.7 mm of Hg (mean) and desaturation of 91%.
- group A all patients maintain Etco<sub>2</sub> 32.7 (mean) mm of Hg
- There was not a single episode of hypercarbia and respiratory depression, or desaturation in any of patients during entire operation in group A.

Intraoperative seizures were present in 4 patients (3%) in group A, 7 patients (5%) in group B which was present during mapping due to touching of functional areas of cortex., stopped by cold saline irrigation

Nausea and Bradycardia was present Perioperatively in 2 patients in each group which was due to deep cortical resection near midline treated accordingly. by coordinating with surgeon to reduce traction, administration of anticholinergic more effective than antiemetic.()

10 patients in group B (7.4%) have tight brain which was relieved by increasing Dexmedetomidine infusion rate, and furosemide

Postoperative vitals were normal in both groups & no complications noted ( $P > 0.05$ )

Mean hospital stay was more 3.98 days in group B, whereas 3.80 days in group A.

Patients satisfaction score was good with AAA & satisfactory with MAC.

Surgeon satisfaction score was excellent with AAA & good with MAC.

## DISCUSSION

**Management of anaesthesia for awake craniotomy varied as evolution in various anaesthetic drugs, technique, as well as gazzates available for Anaesthesia**

- Awake craniotomy poses unique challenges especially for the anaesthetist who is faced with an unprotected airway and limited access to the patient due to positioning and pinning of the head.(1)
- So, appropriate patient selection, counseling is important for this method.(2)
- Patient require sedation or general anaesthesia until the brain is exposed and again at the end of surgery while the cranium is closed.

.In present study we have compared Two well-known techniques .Both groups patients premedicated in same manner.We have used Dexmedetomidine in both groups as it provides sedation without cognitive impairments (8)

scalp block was given with 0.25% bupivacaine (max.30ml) to decrease pain.(9)intraoperative sedation was assessed by Ramsey sedation score ( RSS )was managed around 3 before mapping,and 2 after mapping. sedation should be titrated as under sedation cause anxiety , hypertension, tight Brain & oversedation causes desaturation, problem of correspondence during mapping..(11,13)

In group A airway was managed by second generation LMA(Igel) as it can be removed with minimum access & with out causing Laryngeal irritability.(7)

Scalp block provide Perioperative&post operative analgesia.no patient have emergence hypertension as we have not intubate any patient(2,10)

Complications observed in our study were comparable with study of Ezenonu CL,(12) in terms of complications, haemodynamics stability, hospital stay(12)

Mean hospital stay was less in group A.,but was statistically insignificant.scientists are inventing method for outdoor awake craniotomy (10)

Patients satisfaction score & Surgeon satisfaction score was more in favour of AAA technique than MAC.

#### LIMITATIONS::

Limitations of our study were we have done study in limited number of cases.large scale study required.

Study design for day care surgery or earlyambulation surgery for uneventful tumor resection should be done.

BIS monitoring for depth of Anaesthesia is more useful than RSS, which was available for only 5 patients of each group.

## **CONCLUSION**

- Dexmedetomidine is noble, newer anaesthetic agent used in neuro Anaesthesia
  - Awake craniotomy was more effectively conducted by AAA than MAC in terms of better airway management. & Less incidence of complications, less hospital stay.
- . In Nutshell AAA technique is more effective than MAC technique for awake craniotomy.

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