General Anesthesia with Target Controlled Infusion of Propofol and Remifentanyl for Planned Caesarean Section in a Parturient with Unruptured Intracranial Aneurysm

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What do we know about unruptured Intracranial Aneurysms?

The incidence of cerebral aneurysm in general population is 2%.

In pregnancy the incidence is similar, but the rupture is more common.

Rupture causes subarachnoid hemorrhage.

Regardless of the anesthetic technique, the main objective is to maintain stable the transmural pressure.

Which anesthetic technique for a planned caesarean section?

General Vs Spinal/epidural

No formal recommendations or guidelines for patients with unruptured intracranial aneurysms.

Case description

30Yo ♀, 39 weeks gestation .

Admitted for elective caesarean section.

Indication : unruptured intravascular carotid aneurysm.

History of left anterior cerebral artery aneurysm clipping 1 year before.

Without any other known pathology.

Premedication:

30mL PO NaCitrate 0.3M
10mg EV Metoclopramide
50mg EV Ranitidine
+ 2g Cefazolin

Monitoring:

Pulse oximetry
Bispectral index depth of anesthesia
Peripheral body temperature,
Continuous direct arterial pressure measurement
5 channel ECG
Neuromuscular function
Diuresis

TCI Remi Ce 2,5 ng/mL

Ce 4

Ce 2,0

puncture for
arterial line

FaceMask O₂ 100%

3 min

TCI 1%Propofol 3,3mL/Kg/h

Ce4,6

Intubation

Ce3,2

80mg Rocuronium

MAP 91mmHg

MAP104mmHg

LOC (corneal reflex)
total 114mg Prop
Ce 4,6mcg/mL

...9 min after intubation

♀ 3395 g

Apgar 5 1min
9 5min

Assisted mask
ventilation

1min45sec

No further medical
intervention

Remi Ce 2,0 Ce2,5

170mg Sugamadex

Ce 2,5

Extubation

Propofol Ce 3,2

Ce1,3

Ocitocin 5 IU bolus perfusion (10IU in 1LNaCl 0,9%)
1g paracetamol and 40 mg parecoxib

General Anesthesia in Obstetrics

- Airway management: oropharyngeal edema;
- Increased risk for aspiration;
- Faster desaturation in apnea.

Neuraxial Anesthesia in Cerebral Aneurysm

Substantial leakage of cerebrospinal fluid following dural puncture can cause lowering intracranial pressure, thereby increasing wall stress and the risk of aneurysm rupture.

Choice of anesthetic management in this case

- Intubation and skin incision represent noxious stimuli that may result in aneurysm rupture;
- Opioids obtund this response, but may depress the fetus;
- Remi by TCI allows tight control of concentrations;
- FDA information : Remi Ce of 2ng/mL does not cause respiratory depression in the adult. In the fetus Remi elimination is fast.

Learning Points

In a caesarean section in a parturient with a cerebral aneurysm Total intravenous anaesthesia with TCI of Remi allowed titration of the opioid concentration in order to obtund sympathetic responses to intubation and incision providing safe maternal anesthesia with minimal side effects in the neonate.