



Concurrent CSF manometry and subsequent neuraxial anaesthesia for a pregnant woman requiring emergency caesarean section, in the context of a history of idiopathic intracranial hypertension

Background

Neuraxial anaesthesia are commonly administered for patients requiring caesarean sections. In patients with Idiopathic Intracranial Hypertension (IIH), it is important to determine the cerebral spinal fluid (CSF) opening pressure prior to the administration of neuraxial anaesthesia, in order to provide optimize outcomes for both the patient and the fetus.

Normal intracranial pressure ranges between 10-15 mmHg. In ICH, administration of spinal anaesthesia can further increase the volume of fluid in the subarachnoid space, acutely raising intracranial pressures¹.

Aim

To provide clinicians in the field of Obstetrics and Gynaecology (O&G) with an understanding on the pregnant patient with a history of IIH, and the need to assess pre-operatively the opening CSF pressures before proceeding with neuraxial anaesthesia. An emergency situation may result in the choice for general anaesthesia instead.

Case

A 36-year-old G5P4, 35+4 weeks gestation with known DCDA twins which were being closely monitored for worsening fetal growth restriction (FGR) and new raised UAPI above the 95th centile.

She was admitted, given a course of intramuscular steroids for fetal lung maturation, and planned for a caesarean section subsequently.

Pregnancy issues

- 1) Intracranial hypertension – known to a private Neurologist
- Pt was on Acetazolamide pre-pregnancy, unmedicated antenatally
- Stable visual fields throughout pregnancy, cleared by private Neurologist for routine intrapartum care, including the use of neuraxial anaesthesia
- 2) DCDA twins – planned for CS as mode of delivery owing to 4 previous caesareans, and first twin with breech presentation, FGR.
- 3) Anti-cardiolipin antibody positive - no PMH of thrombosis
- 4) Chronic hypertension which developed into pre-eclampsia
- Raised urine PCR 50, but otherwise normal investigations
- Titrated up to Methyldopa 250mg TDS at the time of delivery
- 5) BMI 33 - Weight 112.4 kg
- 6) IVF pregnancy
- 7) Allergy: Morphine



Obstetrics History:

- P1 – 2002. 37/40. Emergency CS. APH
P2 – 2003. 38/40. Elective repeat CS.
P3 – 2005. 38/40. Elective repeat CS.
P4 – 2007. 38/40. Elective repeat CS with tubal ligation
P5 – 2023. Current DCDA twins, IVF pregnancy

Current Pregnancy:

A pos, antibody neg. Rubella immune. Serology (Hep B/C/HIV): Neg
NIPT low risk. OGTT neg.
US 24: T1 EFW 52th, T2 EFW 18th
US 27: T1 EFW 91st, T2 EFW 11th
US 32: T1 EFW 75th, T2 EFW 19th
US 34: T1 EFW 54th, breech. T2 EFW < 2nd, Normal DVP/dopplers.
US 35: Both twins with N DVP. T2: UAPI >95th centile

References:

- ¹ Alves et al. Multidisciplinary management of idiopathic intracranial hypertension in pregnancy: case series and narrative review. [Internet]. 2021 Mar [cited 2023 Aug 2]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9659994/>
- ² Smith JL. Whence pseudotumor cerebri? J Clin Neuroophthalmol. 1985 Mar;5(1):55-6. PMID: 3156890.
- ³ Thaller M, Wakerley BR, Abbott S, et al Managing idiopathic intracranial hypertension in pregnancy: practical advice Practical Neurology 2022;22:295-300.
- ⁴ Pregnancy and Medicines Breastfeeding Guide. The Royal Women's Hospital. Accessed on 1 Oct 2023. Available from: <https://thewomenshpg.org.au/acs/hcn.com.au/medicines/acetazolamide/>

Idiopathic Intracranial Hypertension (IIH)

IIH refers to a raised intracranial pressure with no discernable causes despite imaging and other investigations. It differs from secondary intracranial hypertension (secondary to tumours or neoplasms).^{1,2} Obesity is a major risk factor for IIH.

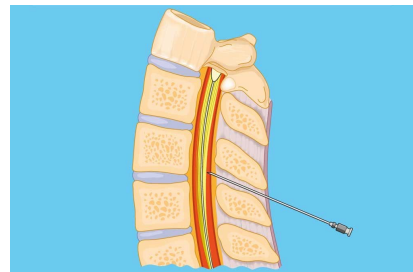
Symptoms may include, but are not limited to:²

- Headache, papilledema, double vision, visual obscurations and vision loss

These symptoms may possibly increase in severity during pregnancy, for example the progressive loss of visual fields may become permanent in certain cases³.

The main first line medication utilized in ICH is Acetazolamide (Pregnancy Class B3). Acetazolamide is a carbonic anhydrase inhibitor which functions by reducing cerebrospinal fluid (CSF) production. There are case reports linking to birth defects with antenatal use⁴.

Neuraxial anesthesia is contraindicated in patients with intracranial hypertension secondary to space occupying lesions, owing to the risk of herniation. However, in IIH patients there is a uniform swelling of the brain that prevents herniation, so neuraxial anesthesia can be considered¹.



Case - continued

The patient's private Neurologist was contacted by the anaesthetic team, who reassured that the patient's intracranial pressure had been stable at 38 cm H₂O (27.9 mmHg). He offered the option of measuring the CSF opening pressures, and discarding CSF prior to the administration of spinal anaesthesia.

With the patient's consent, a pre-spinal anaesthesia lumbar puncture to determine intra-cranial pressure prior to a technically difficult caesarean section. The rate of CSF flow with the lumbar puncture was 8.8 mmHg, hence it was determined that the intracranial pressures were normal, and there were no further contraindications to the subsequently administered spinal anaesthesia.

An uncomplicated caesarean section was subsequently conducted by our experienced Obstetrics team with 2 healthy live DCDA twins delivered. The patient was well debriefed during her uneventful postnatal stay, and was subsequently discharged home.

Discussion

A multi-disciplinary approach to the management of high-risk patients with IIH has benefits in reduction of maternal morbidity rates.

In this case, good communication between the Anesthetics and Obstetrics with the patient's Neurologist resulting in a thoughtful approach to ensure safe opening CSF pressures prior to the administration of the spinal anaesthesia resulted in a good patient outcome with no complications