The European Society of Regional Anaesthesia & Pain Therapy
ESRA ITALIA

ESRA ITALIAN CHAPTER

30° NATIONAL MEETING

13-15 NOV 2025

NAPOLI
HOTEL RAMADA

Presidents:
Giuseppe Servillo, Fabrizio Fattorini

MZ EVENTS

NEURAXIAL ANESTHESIA/ANALGESIA IN PREGNANT WOMAN WITH SEVERE NEUROLOGICAL MORBIDITY

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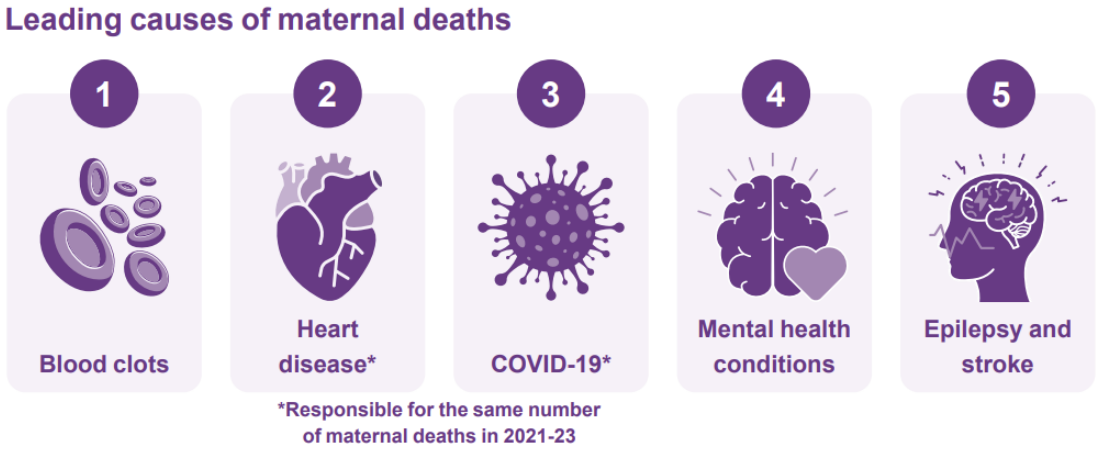
EPIDEMIOLOGY

MBRRACE-UK
Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK

September 2025



Mortality results predominantly from *epilepsy* and *stroke-related causes*

PREGNANCY AND NEUROLOGICAL DISEASES

Neurological disorders in pregnancy can be **pregnancy related**
or can be caused by exacerbation of a **pre-existing neurological condition**

BEFORE CONCEPTION

- detailed diagnosis and evaluation
- planning

Neurological Disorders Complicating Pregnancy - Focus on Obstetric Outcome

Journal of Clinical and Diagnostic Research. 2016 Dec, Vol-10(12): QC06-QC09

BEFORE DELIVERY

Multidisciplinary (obstetrician, anesthesiologist, neurologist, neurosurgeon) evaluation to:

- determine **neurological status**
- optimize **medical therapy**
- determine the **mode and timing of delivery**
- establish **type of anesthesia**
- establish **peripartum management**

Catarci *et al. BMC Anesthesiology* (2025) 25:32
https://doi.org/10.1186/s12871-024-02871-5

Anesthesia for pregnant patients
with symptomatic neurological disease:
13 years' experience from a tertiary care center

EVIDENCE

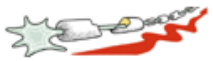
Scarce

Case reports and series, retrospective/prospective cohort studies, systematic review

Only guidance on optimization BEFORE delivery

Lack of exhaustive guidelines regarding anesthetic management IN the delivery room

EPILEPSY



MULTIPLE SCLEROSIS

CEREBROVASCULAR DISEASES

MYASTHENIA GRAVIS

INCREASED ICP CONDITIONS

NEUROMUSCULAR DISEASES

SPINAL DYSRAPHISM

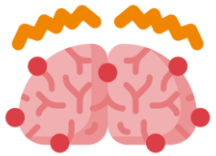
SPINAL CORD INJURIES

MOST COMMON!! (0,7% of the population)

EPILEPSY

Data from EURAP (International Registry of Antiepileptic Drugs and Pregnancy):

- Less than 1/3 of women has change in seizure frequency
- Risk of epilepsy is the highest during delivery



Neuraxial techniques can be used **except for those with active manifestations of epilepsy**

EPILEPSY

LABOR ANALGESIA

Labor analgesia reduces stress derived by pain, sleep deprivation and dehydration
Neuraxial analgesia: technique of choice (LA not to overdose!!!)
Systemic analgesia: avoid pethidine

ANAESTHESIA FOR CS

Neuraxial always possible if no active manifestations of epilepsy
For GA avoid etomidate
NMBAs hepatic metabolism is induced by AEDs (shortened duration of action)

Curr Opin Obstet Gynecol 2019, 31:97–109

BJA Education, 21(6): 210–217 (2021)

B. Haider, J. von Oertzen / Best Practice & Research Clinical Obstetrics and Gynaecology 27 (2013) 867–875

(0,1-0,2 % of the population)

MULTIPLE SCLEROSIS

MS in pregnancy	Remission due to estrogen levels suppressing immune mediated disease activity Relapses more common post-partum **Pain & hyperthermia are known triggers for exacerbation of MS symptoms**
Effects of LA on demyelinated fibers	Intrathecal LA was reported to unmask silent demyelination ***BUT these symptoms are transient and reversible***
Neuraxial techniques and relapses of MS	**NO CORRELATION (PRIMS STUDY)** Confavreux C, Hutchinson M, Hours MM, Cortinovis-Tourniaire P, Moreau T. Rate of pregnancy-related relapse in multiple sclerosis. Pregnancy in Multiple Sclerosis Group. *N Engl J Med* 1998; **339**: 285–91
General anesthetics	**Propofol, Fentanyl, Sevoflurane, N2O, Vecuronium OK** **Depolarising NMBAs:** hyperkalaemia by MS-induced denervation **Non-depolarizing NMBAs**: prolonged effect due to decreased muscle mass
Patients with preexisting neurologic deficits Neal JM, Bernards CM, Hadzic A, Hebl JR, Hogan QH, Horlocker TT, *et al.* ASRA Practice Advisory on Neurologic Complications in Regional Anesthesia and Pain Medicine. Reg Anesth Pain Med 2008;33:404-15.	*"a careful risk-to-benefit assessment of regional anesthesia to alternative perioperative anesthesia and analgesia techniques should be considered as these patients may be at **increased risk** of new or worsening injury **regardless of anesthetic technique**"*

MULTIPLE SCLEROSIS

EJA

Eur J Anaesthesiol 2025; **42**:508–517

INFOGRAPHIC

ORIGINAL ARTICLE

Effect of neuraxial anaesthesia or analgesia on postpartum relapse rates in multiple sclerosis

A systematic review

Dimitrios Ioannopoulos, Kleanthi Manika, Panagis M. Lykoudis, Marianna Papadopoulou, Eleftheria Lelekaki, Zoi Tsani and Pinelopi Kouki

OUTCOME

Incidence of MS relapses up to 1 year after childbirth

DESIGN

Systematic review of RCTs and non-RCTs

Table 2 Reported relapses across compared arms with/without neuraxial anaesthesia/analgesia

First author (year)	Sample size of study arms NA vs. W/o NA	Post-pregnancy relapses NA vs. w/o NA [number of Pts with post-pregnancy relapses (%)]
Bouvet *et al.* (2021)[26]	96 vs. 22	26 (27) vs. 5 (23)
Lavie *et al.* (2018)[23]	156 vs. 233	36 (23) vs. 61 (26)
Harazim *et al.* (2018)[27]	18 vs. 53[a]	5 (28) vs. 20 (38)
Jesus-Ribeiro *et al.* (2017)[28]	62 vs. 49	23 (37) vs. 20 (41)
Pasto *et al.* (2012)[29]	65 vs. 284	24 (37) vs. 124 (44)
Dalmas *et al.* (2003)[24]	11 vs. 8	1 (10) vs. 4 (50)
Confavreux *et al.* (1998)[25]	42 vs. 180	1.6 (0.9 to 2.3) vs. 1.2 (1.0 to 1.4)[b]
Bader *et al.* (1988)[30]	14 vs. 18	5 (36) vs. 4 (22)

NA, neuraxial anaesthesia/analgesia; NR, nor reported; Pts, patients; W/o, without. [a] One case lost to follow-up. [b] Mean number of relapses per woman per year (95% confidence intervals).

MULTIPLE SCLEROSIS

Table 1: Anesthetic implications of multiple sclerosis[12]

Demyelination affecting	Clinical signs and symptoms	Anesthetic implications
Brain	Depression, fatigue, painful seizures, pain syndromes, sensory deficits	Interaction with antidepressants, anticonvulsants agents used for treatment of pain
Corticospinal tracts	Upper motor neuron type of paralysis with spasticity, hyperactive deep reflexes, up going Babinski	Upregulation of acetylcholine receptors, altered response to muscle relaxants: N-M monitoring
Brain-stem, optic tracts, cranial nerves	Visual-impairment, nystagmus, diplopia, trigeminal neuralgia, dysarthria, dysphagia, depressed pharyngeal, laryngeal reflexes	Interaction with pain medications used for trigeminal neuralgia, risk of aspiration-Use of Sellick's manoeuvre, H_2 blockers, proton-pump inhibitors, antiemetics
Brain-stem and spinal cord	Autonomic dysfunction with cardiac dysrhythmia, Impaired control of ventilation, reduced response to raised pCO_2, diaphragmatic paralysis, ventilatory problems due to reduced respiratory muscle strength, limb-weakness, paresthesias, sensory deficits, Pain-medications/drugs for spasticity	Cardiac dysfunction hypotension with inhalational agents, regional techniques with poor response to fluid loading and pressor agents. Hypoventilation, hypoxaemia, apnea, respiratory failure postoperative O_2/mechanical ventilation indicated. Cardiovascular, respiratory monitoring essential. Resistance/sensitivity to N-M blockers, N-M monitoring essential
Others	Even 0.5° rise in body temperature can cause exacerbation	Core and surface temperature monitoring

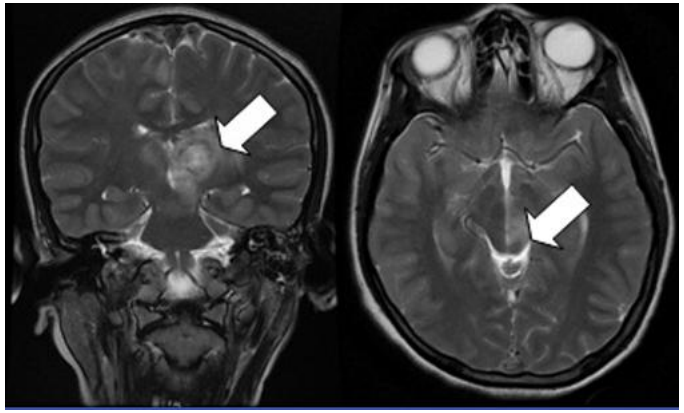
Short Review

Anesthetic management for parturients with neurological disorders

Nesrine Abd El-Rahman El-Refai

CEREBROVASCULAR DISEASES

- **INTRACRANIAL HAEMORRHAGE & SUBARACHNOID HAEMORRHAGE**
- **ACUTE ISCHEMIC STROKE**
- Postpartum conditions (CEREBRAL VENOUS SINUS THROMBOSIS, POSTPARTUM ANGIOPATHY, PRES)



➡ **The risk from MRI is generally considered lower after the 1st trimester**

CEREBROVASCULAR DISEASES

- **ICH & SAH** (cerebral aneurysm, AVM, HELLP syndrome, vasculitis)

Increased risk of bleeding from **AVM** in pregnancy

Neurological Disorders Complicating Pregnancy - Focus on Obstetric Outcome

Journal of Clinical and Diagnostic Research. 2016 Dec, Vol-10(12): QC06-QC09

CEREBROVASCULAR DISEASES

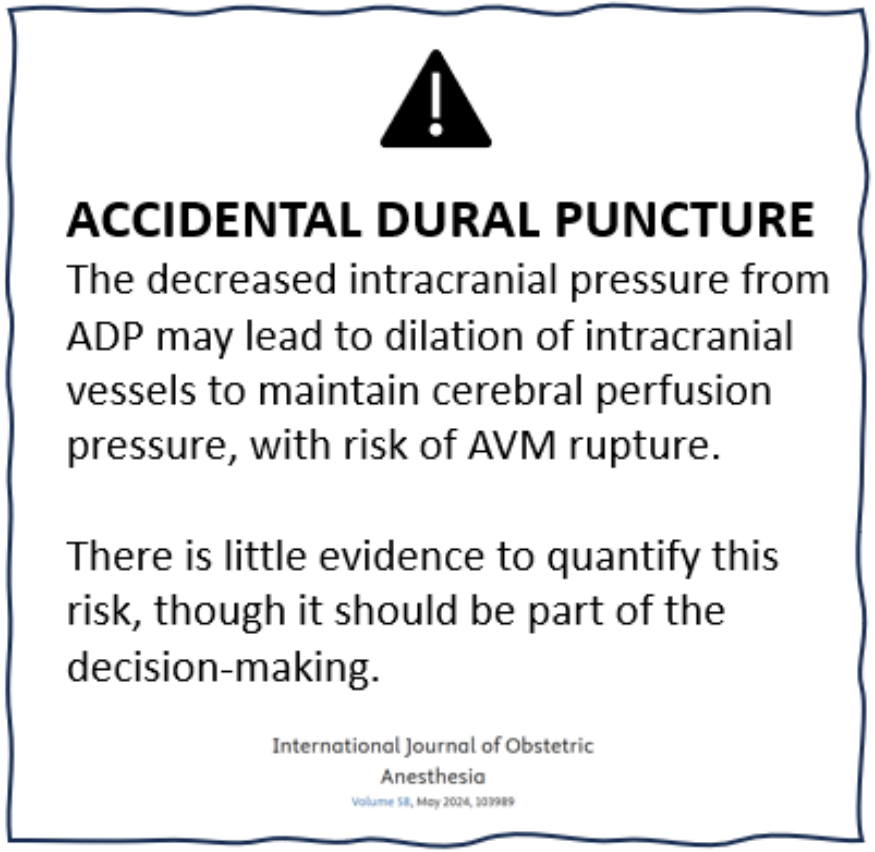
- **ICH & SAH** (cerebral aneurysm, AVM, HELLP syndrome, vasculitis)

MODE OF DELIVERY	No evidence to recommend mode of delivery (CS safer to prevent rupture by controlling BP??)
INITIAL MANAGEMENT	Airway protection, CV support and neuroprotection
GA	If urgent delivery of the fetus/Reduced level of consciousness, confusion, severe haemodynamic complications (hypo-/hy pertension, arrhythmias), or need of neurosurgical intervention. **TIVA may provide smoother control of BP and prevent exacerbation of cerebral oedema.** **Magnesium sulphate or lidocaine infusions in addition to remifentanil may be useful.**
NEURAXIAL ANESTHESIA	Women with minor symptoms (haemodynamically stable and conscious)
ICU	To be considered
PREVENTION OF VASOSPASM AFTER SAH	**Triple H-therapy** (hypertensive and hypervolemic hemodilution) not based on high levels of evidence. The pregnant woman is relatively hypervolemic and hemodiluted compared with the no pregnant state. - Magnesium sulfate - Nimodipine is potentially teratogenic

Neurological Disorders Complicating Pregnancy - Focus on Obstetric Outcome

Journal of Clinical and Diagnostic Research. 2016 Dec, Vol-10(12): QC06-QC09

CEREBROVASCULAR DISEASES



CEREBROVASCULAR DISEASES

- **ACUTE SCHEMIC STROKE**

rarer form of stroke in pregnancy (67/100.000)

RISK FACTORS	Pre-eclampsia, eclampsia, hypertension, CS, prothrombotic states, older age, black ethnicity, greater parity and multiple gestation
THERAPY	**Thrombolysis, anticoagulation and antiplatelet** medications. Thrombolysis in pregnancy is controversial and carries the additional risks of placental abruption, systemic bleeding and fetal loss.
GOALS	**BP control** and especially avoidance of hypotension (paramount for both maternal and fetal outcomes).
OBSTETRIC MANAGEMENT	**Expectant** unless there are difficulties in achieving haemodynamic targets to improve cerebral perfusion, and fetal delivery is judged to be of benefit to the mother.
ANESTHETIC MANAGEMENT	Consider: (1) timing of anticoagulant/antiplatelet drug dosing (2) patient's neurological status. **Regional anaesthesia to prefer if it is safe to perform.**
NEUROPROTECTIVE STRATEGIES	Elevation of the head, prevention of major swings in arterial pressure, avoidance of hypercapnia and hypoxia and hyperosmolar therapy.
ICU	Strongly considered.

1/5000 women

MYASTHENIA GRAVIS

- ✓ Higher numbers of **operative vaginal deliveries and CS** due to pelvic floor muscles weakness
- ✓ Involuntary muscles like the uterus not involved
- ✓ **Respiratory compromise** (requiring mechanical ventilation), **bulbar involvement**, **autonomic dysfunction**

(PRE)-ECLAMPSIA AND MG

Magnesium sulphate can precipitate myasthenic crisis

and should be **given where ventilatory support can be provided**

(alternatives as phenytoin or barbiturates to be considered)

MYASTHENIA GRAVIS

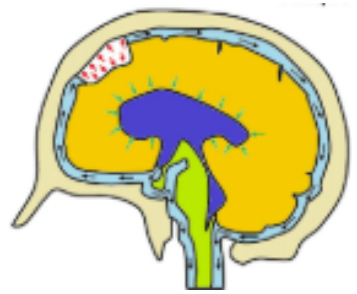
GENERAL ANESTHESIA	NEURAXIAL ANESTHESIA
Must be administered cautiously **Non-depolarising NMBAs** to be reduced (1/10 of the normal dose) **Suxamethonium** may need increased dosing (up to 2 mg/kg) as patients with MG tend to be resistant to its effects **Volatile agents** cause muscle weakness **Sugammadex** is preferred (neostigmine may precipitate a cholinergic crisis at higher doses) **Oxytocin** at the smallest effective dose in patients with autonomic dysfunction	Recommended to minimise the risk of myasthenic crisis caused by pain Safe if profound/high sensory and motor blockade are avoided (high blocks can precipitate respiratory weakness and require ventilatory support) **CSE** with low dose LA and opioid or slowly **titrated epidural** = good options

INCREASED ICP CONDITIONS

IDIOPATIC INTRACRANIAL HYPERTENSION, BRAIN TUMORS, CHIARI I MALFORMATION, etc

(0,5% of the american population)

RISKS OF NEURAXIAL ANESTHESIA:



- **MAJOR CONCERN:** POTENTIAL FOR HERNIATION OR ICH AFTER DURAL PUNCTURE
- **Subdural/subarachnoid hematoma after epidural/spinal anesthesia**
- **epidural injection can cause an increase in ICP by compression of the dural sac**

(NO clear clinical significance, though **slow injection of incremental volumes of LA is recommended**)

→ Sastry R, Sufianov R, Laviv Y, *et al.* Chiari I malformation and pregnancy: a comprehensive review of the literature to address common questions and to guide management. Acta Neurochir (Wien) 2020; 162:1565–1573.

→ Knafo S, Picard B, Morar S, *et al.* Management of Chiari malformation type I and syringomyelia during pregnancy and delivery. J Gynecol Obstet Hum Reprod 2021; 50:101970.

→ Simpson A, Ferguson C. Anaesthetic management of obstetric patients with Chiari type I malformation: a retrospective case series and literature review. *Int J Obstet Anesth* 2024; **60**, 104232

CURRENT OPINION **Neurologic disease in the obstetric patient** **Curr Opin Anesthesiol** 2024, 37:453–459
DOI:10.1097/ACO.0000000000001405

INCREASED ICP CONDITIONS

Neuraxial anaesthesia for the parturient with intracranial pathology

C. Warrick[1], W. Schievink[2] and M. Zakowski[2,*]

BJA Education, 25(1): 38–45 (2025)

Intracranial pathology

↓

New onset neurological symptoms
OR lesion may grow/change during pregnancy
OR no imaging available

↓

Obtain imaging with new onset of neurological symptoms
OR within 2 months of expected birth

↓

Do not proceed	Consult neurosurgery/neurology before neuraxial procedure	Reasonable to proceed
Space-occupying lesion with significant mass effect	Space-occupying lesion with small/localised mass effect OR Hydrocephalus or signs of increased ICP with CSF flow obstruction	No clinical signs of increased ICP OR Stable neurological symptoms with no signs of increased ICP (not progressing) OR Communicating hydrocephalus

INCREASED ICP CONDITIONS

Anaesthesia and neurological disorders in pregnancy

Y. Metodiev[1,*] and F. Braveman[2]

[1]Cardiff & Vale University Health Board, Cardiff, UK and [2]University of Minnesota, Minneapolis, MN, USA

BJA Education, 21(6): 210–217 (2021)

NEURAXIAL ANALGESIA NOT CONTRAINDICATED IN MILDER FORMS OF INTRACRANIAL DISEASES

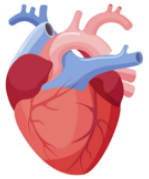
NON NEURAXIAL LABOR ANALGESIA MAY ALSO HAVE HARMFUL EFFECTS ON ICP

GA FOR CS HAS PHYSIOLOGIC EFFECTS ON ICP AND CEREBRAL HAEMODYNAMICS

NO significant outcome differences between vaginal delivery and CS and NO increased risk with neuraxial anesthesia for patients with CM I

NEUROMUSCULAR DISEASES

- **Myotonic dystrophy** (DM) *most common muscular dystrophy in adults*
- **SMAs** *most common in childbearing age is type 2*



Association with cardiomyopathies or alterations in the myocardial conduction system.

The ability to increase CO in response to stress during delivery may be limited due to a reduced functional reserve.

Right ventricular modifications in patients with pulmonary hypertension.

Respiratory involvement may vary significantly between different neurological diseases.

Reduction in inspiratory muscle strength results in restrictive pulmonary impairment with a progressive decrease in force vital capacity.

Weakness of expiratory muscles leads to inadequate clearance of airway secretions. Hypoventilation may also be associated with impaired cough.

= MULTISYSTEMIC DISEASES

NEUROMUSCULAR DISEASES

LABOR

Neuraxial techniques can mitigate the risks of GA
(early labor epidural to extend to surgical anesthesia if required)

CS

often required due to abdominal and truncal muscle weakness
POST-CS ANALGESIA: Low-dose spinal opioids (respiratory function monitored!) or **regional blocks** (QLB and TAP)

RISKS OF NA

may be challenging due to severe scoliosis **(consider US guidance!)**

not properly titrated blocks may worsen respiratory function/precipitate heart failure

SPINAL DYSRAPHISM

Open spinal dysraphisms
- Myelomeningocele
- Myelocele
- Hemimyelomeningocele
- Hemimyelocele

Closed spinal dysraphisms

With subcutaneous mass

Lumbosacral
- Lipomas with dural defect
  - Lipomyelomeningocele
  - Lipomyelocele
- Terminal myelomeningocele
- Meningocele

Cervicothoracic
- Non-terminal myelocystocele
- Meningocele

Without subcutaneous mass

Simple dysraphic states
- Intradural lipoma
- Filar lipoma
- Tight filum terminale
- Persistent terminal ventricle
- Dermal sinus

Epidural space and ligamentum flavum may not be present!!

- 'Open' lesions or evidence of lumbosacral neurological deficits requires additional investigation.

Low-lying spinal cord + conus medullaris and tethered spinal cord are frequent

- 'Closed' lesions with no signs of lumbosacral neurologic deficits are typically safe for neuraxial anesthesia.

Walsh E, *et al*. *Reg Anesth Pain Med* 2021;**46**:258–267. doi:10.1136/rapm-2020-101792

SPINAL DYSRAPHISM

MRI scan is mandatory to assess:

- *level of termination of the conus medullaris*
- *if spinal cord tethering is present*
- *masses or cysts and evaluation of CSF volume*
- *levels where ligamentum flavum is intact and if it can be accessed*

Neuraxial techniques are not contraindicated in all cases

EPIDURAL: if ligamentum flavum is intact but **risk of incomplete analgesia**.

SPINAL: if MRI scan suggests that the subarachnoid space can be accessed **without injuring the spinal cord**.

Laryngoscopy after induction and Valsalva may BOTH increase ICP

Walsh E, *et al*. *Reg Anesth Pain Med* 2021;**46**:258–267. doi:10.1136/rapm-2020-101792

SPINAL DYSRAPHISM

ELSEVIER

International Journal of Obstetric Anesthesia

Volume 24, Issue 3, August 2015, Pages 252-263

Review article

Spinal dysraphisms in the parturient: implications for perioperative anaesthetic care and labour analgesia

C.J. Murphy [a], E. Stanley [b], E. Kavanagh [b d], P.E. Lenane [b c], C.L. McCaul [a b d]

84 patients (41 complex spinal dysraphism)

success in 80% of cases

15 spinal/CSE and 52 epidural without serious complications

The most common issues were suboptimal analgesia or block height

"If a neuraxial technique is chosen, authors recommend a slowly titrated epidural to limit alterations in CSF flow dynamics. An experienced anesthesiologist should site the epidural to reduce the likelihood of a dural puncture"

(Anesth Analg 2017;125:913–24)

SPINAL CORD INJURIES

Pragmatic approach to neuraxial anesthesia in obstetric patients with di… column, spinal cord and …

Elisa Walsh,[1] Yi Zhang,[1] Hannah Madde…

Walsh E, *et al*. *Reg Anesth Pain Med* 2021;**46**:25

be considered.[80 81] It can be difficult to precisely define a satisfactory block in an insensate parturient. In some cases, the resulting block 'level' may be identified where previously spastic limbs become flaccid.[68]

Short Review

Anesthetic management for parturients with neurological disorders

Nesrine Abd El-Rahman El-Refai

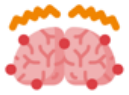
MODE OF DELIVERY	Vaginal delivery and CS are both options
AUTONOMIC DYSREFLEXIA	**high BP + bradycardia** (tachycardia may also occur) main concern during labor and delivery especially for injuries at **level T6 or above** useful for the amelioration of AH *High concentrations and volumes of LA should be avoided at all times, especially in patients with nerve compression, large disc herniation, or spinal stenosis.*
SPINAL ANESTHESIA	superior to epidural for hemodynamic protection against AD.

*the only one supported by RCTs

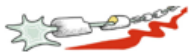
ECLAMPSIA

SYMPTOMS	persistent frontal and occipital headache, blurred vision, scotoma, photophobia, altered mental status and **seizure (tonic-clonic convulsion)**
MAGNESIUM SULFATE	**4 g iv over 5-15 min + infusion of 1 g/h over 24 h (NICE)** **4-6 g loading dose + 1-2 g/h (ACOG)** superior to phenytoin and BDZ (antivasospastic effect)
GOALS	prevent maternal injury and ensure cardiorespiratory stability reduce BP to a safe range prevent hypotension to ensure cerebral perfusion & uteroplacental blood flow
IF CONVULSION ARE PRESENT	**lorazepam 4 mg** during labor for generalized seizures or **propofol** (1%, 3-4 mL in repeatable bolus) if in advanced labor or near delivery (the woman may have a normal delivery or a low forceps application with an acceptable level of consciousness)
CAESAREAN SECTION	***REGIONAL ANESTHESIA*** Consciuos, stable patient with no coagulopathy or other contraindications ***GENERAL ANESTHESIA*** Indications: GCS < 9, severe coagulopathy (HELLP syndrome), pulmonary edema, other severe complications Risks: high BP during tracheal intubation Medications: propofol infusion during surgery (avoid etomidate)

CONCLUSIONS ON NEURAXIAL TECHNIQUES



EPILEPSY — BENEFICIAL in stable patients

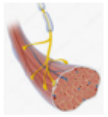


MULTIPLE SCLEROSIS — NOT CONTRAINDICATED

CEREBROVASCULAR DISEASES — NOT CONTRAINDICATED in stable patients

MYASTHENIA GRAVIS — NOT CONTRAINDICATED

INCREASED ICP CONDITIONS — MAY BE PRECLUDED



NEUROMUSCULAR DISEASES — CAN MITIGATE THE RISKS OF GA

SPINAL DYSRAPHISM — MAY BE PRECLUDED

SPINAL CORD INJURIES — NOT CONTRAINDICATED

THANK YOU FOR YOUR ATTENTION AND ... SAVE THE DATE!