Межрегиональная научно-практическая конференция с сестринским участием «Избранные вопросы анестезиологии и реаниматологии»

г. Тверь, 7 июня 2018 г.

Есть ли место ингаляционной анестезии в акушерстве?

д.м.н. ОВЕЗОВ А. М.

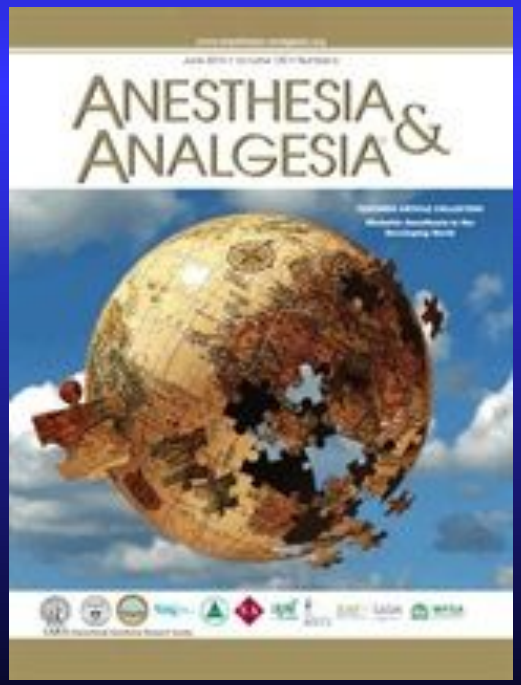
ГБУЗ МО МОНИКИ им. М.Ф. Владимирского

Общая анестезия в акушерстве

Excess in Moderation: General Anesthesia for Cesarean Delivery

Joy L. Hawkins, MD

June 2015 • Volume 120 • Number 6



A prominent finding in the survey was that general anesthesia was used in 44.4% of cesarean deliveries. The authors' conclusions imply that the high rate may be a negative quality indicator. This is certainly a significantly higher rate of general anesthesia than is seen in the United States or in many Western European countries, but how much is too much general anesthesia? What should the rate of general anesthesia for cesarean delivery be, and what evidence can we use to determine that threshold? If 44.4% is too much, is 25% a reasonable goal? Does 15% indicate even better quality care? Is 5%, the often-quoted rate in the United States, too low? Is the rate of general anesthesia for cesarean delivery even a valid quality indicator? There is no evidence-based method to determine the appropriate rate of general anesthesia for cesarean delivery or even data to provide an acceptable range.

Общая анестезия в акушерстве

Choice of Anesthesia for Cesarean Delivery: An Analysis of the National Anesthesia Clinical Outcomes Registry

Jeremy Juang, MD, PhD,*† Rodney A. Gabriel, MD,‡ Richard P. Dutton, MD, MBA,§
Arvind Palanisamy, MBBS, MD, FRCA,*† and Richard D. Urman, MD, MBA*†

Neuraxial anesthesia use in cesarean deliveries (CDs) has been rising since the 1980s, whereas general anesthesia (GA) use has been declining. In this brief report we analyzed recent obstetric anesthesia practice patterns using National Anesthesiology Clinical Outcomes Registry data. Approximately 218,285 CD cases were identified between 2010 and 2015. GA was used in 5.8% of all CDs and 14.6% of emergent CDs. Higher rates of GA use were observed in CDs performed in university hospitals, afte
were American Society of Anesthesiologists c
(Anesth Analg 2017;XXX:00–00)

Частота общей анестезии при кесаревом сечении в США: 5,8% - при плановой операции, 14,6% - в экстренных случаях.

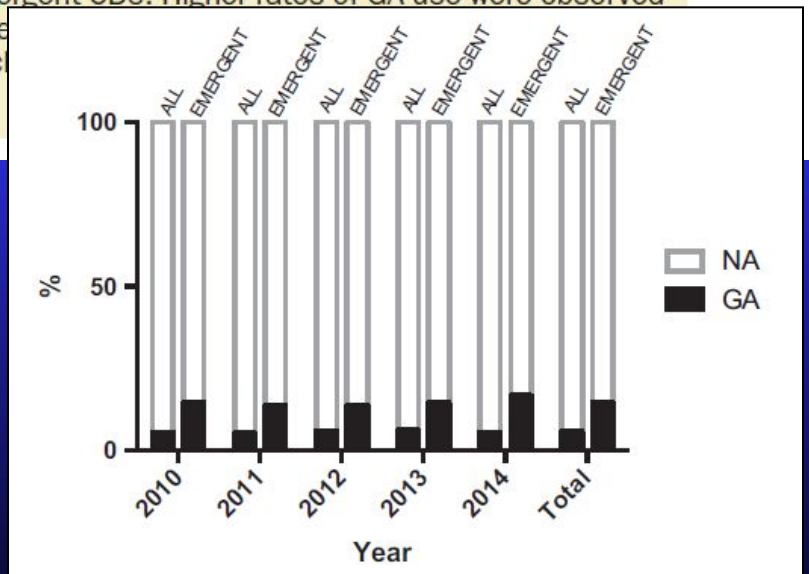


Figure. Percentage of all cesarean deliveries and emergent cesarean deliveries performed under general anesthesia versus those performed under neuraxial anesthesia by year.

Общая анестезия в акушерстве

PRACTICE PARAMETERS

Anesthesiology 2016; 124:270–300

Practice Guidelines for Obstetric Anesthesia

*An Updated Report by the American Society of Anesthesiologists Task Force on Obstetric Anesthesia and the Society for Obstetric Anesthesia and Perinatology**

Общая анестезия при операции кесарево сечение

Показания:

- Отказ пациентки от регионарной анестезии.
- Тяжелая гиповолемия у матери (кровопотеря, шок).
- Острый дистресс плода (выпадение пуповины, длительная брадикардия).
- Врожденные или приобретенные коагулопатии у матери с клиническими проявлениями (кровотечение, гематомы, гипокоагуляция на ТЭГ, лабораторные показатели: МНО более 1,5, АПТВ более 1,5 от нормы, фибриноген менее 1,0 г/л, количество тромбоцитов менее 70×10^9).
- Системные инфекции.
- Некоторые заболевания ЦНС, в первую очередь связанные с высоким внутричерепным давлением (необходима консультация с неврологом, нейрохирургом).
- Заболевания сердца с фиксированным сердечным выбросом или декомпенсацией кровообращения (решается совместно с кардиохирургом).

Общая анестезия в акушерстве

General anaesthesia for operative obstetrics

Matthew Knipe

David Levy

ANAESTHESIA AND INTENSIVE CARE MEDICINE 11:8

A summary of the procedures involved in general anaesthesia for operative obstetrics

Communication	• Multidisciplinary • WHO Surgical Safety Checklist
Preoperative assessment	• Thorough airway assessment essential
Aspiration prophylaxis	• 0.3 M sodium citrate 30 ml (orally) with ranitidine150 mg (orally) or 50 mg (intravenously)
Location	• In operating theatre • Surgeons present and scrubbed • Abdomen draped if emergency
Assistance	• Trained anaesthetic assistant
Positioning	• Left-lateral tilt • Slight head-up position
Monitoring	• As per AAGBI guidelines
Pre-oxygenation	• Facemask with good seal • Aim for fractional end-tidal oxygen concentration >0.9
Induction	• Rapid-sequence induction • Thiopental (5–7 mg/kg) • Succinylcholine (1–1.5 mg/kg)
Intubation	• Cuffed oral tracheal tube • Rehearsed failed intubation drill
Maintenance	• Volatile agent with end-tidal concentration >0.75 MAC with 50% nitrous oxide • Increments of non-depolarizing neuromuscular blocking agent guided by nerve stimulation

Общая анестезия в акушерстве

ПОЛОЖЕНИЕ 9

Этапы	Содержание	Возможные осложнения
Поддержание анестезии после извлечения плода	Фентанил 100–200 мкг, кетамин, тиопентал, бензодиазепины, пропофол Миоплегия: недеполяризующие миорелаксанты рокуроний, атракуриум, векуроний или их аналоги Ингаляция изофлюрана, севофлюрана, десфлюрана севофлюрана до 0,5–1,5 об.% При отсутствии других ингаляционных анестетиков допустима ингаляция закиси азота и кислорода 50% (1:1)	Гипотония матки, кровотечение

Изофлуран? Севофлуран? Десфлуран?

д.м.н. Овезов А.М.

Что выбрать?

REVIEW

CURRENT OPINION

General anesthesia for caesarean section

Sarah Devroe[a], *Marc Van de Velde*[a,b], *and Steffen Rex*[a,b]

Curr Opin Anesthesiol 2015, 28:240–246

MAINTENANCE OF ANAESTHESIA

Notwithstanding limited evidence, sevoflurane has become the maintenance agent of choice in general anaesthesia for caesarean section. In the survey by Murdoch *et al.* [16], sevoflurane was used in 52%, followed by isoflurane (45%) and desflurane (1.6%). Only 0.3% of the anaesthesiologists used propofol for the maintenance of anaesthesia during caesarean section.

В Великобритании поддержание общей анестезии при кесаревом сечении обеспечивается севофлураном в 52%, изофлураном - в 45%, десфлураном - в 1,6% случаев. Только 0,3% анестезиологов используют в этих целях пропофол.

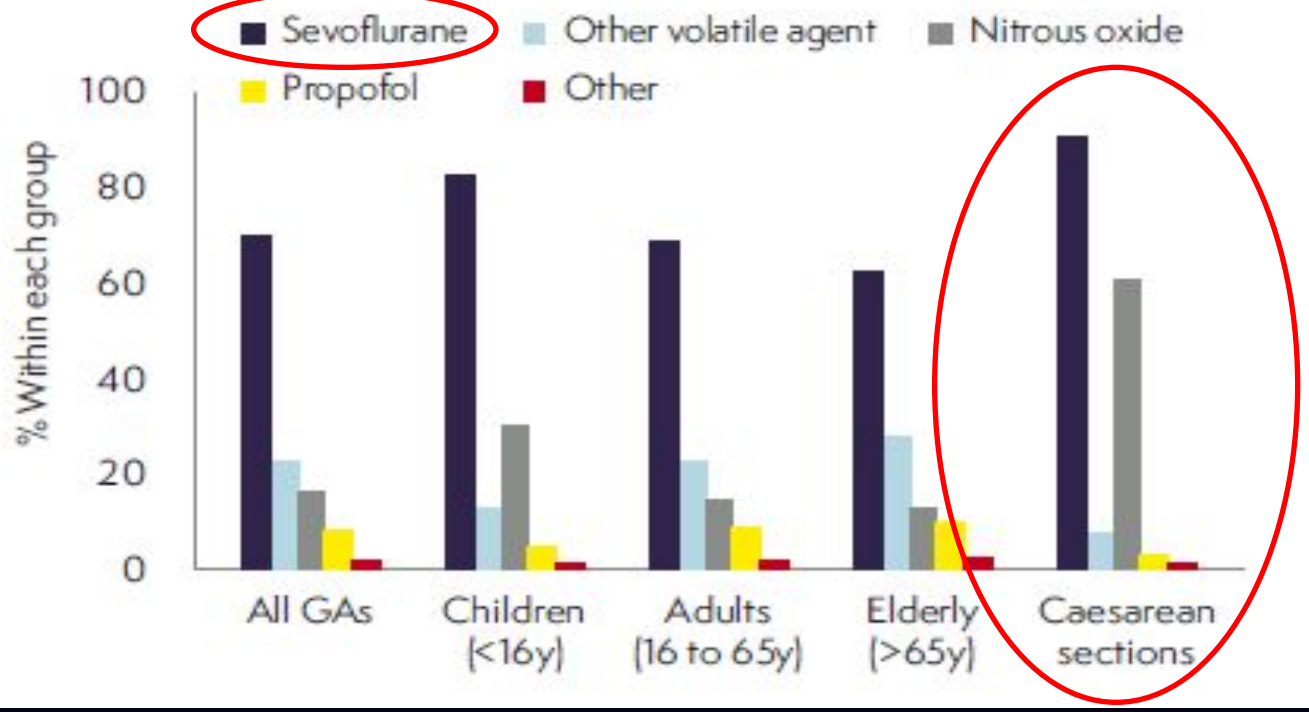
Что выбрать?

RCoA Royal College of Anaesthetists | NIAA | HSRC Health Services Research Centre | NAP National Audit Project

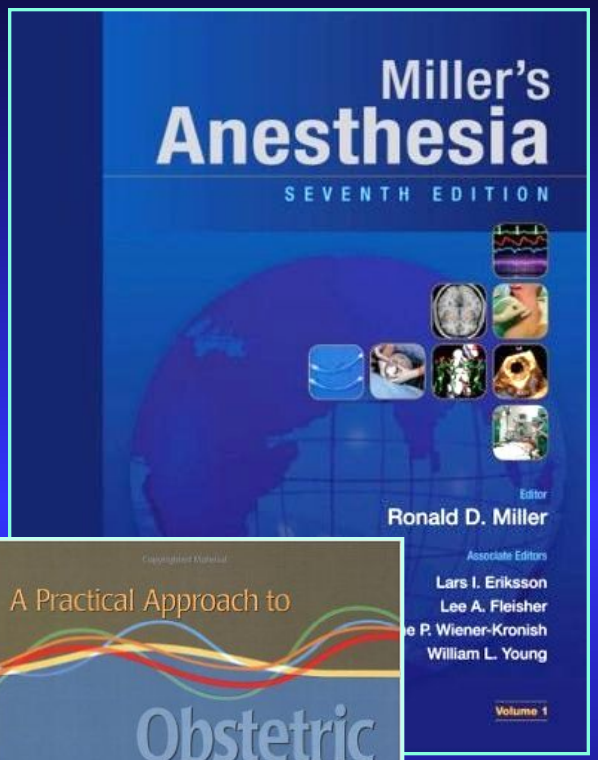
May 2018

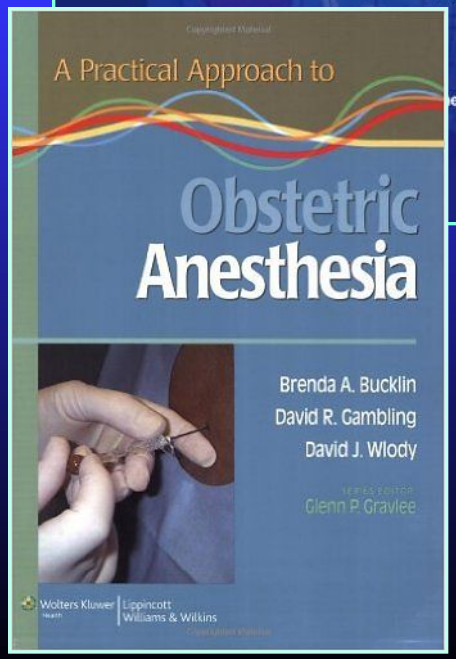
6th National Audit Project: Perioperative Anaphylaxis

Figure 4. Maintenance agent use by age group and in caesarean section



Что выбрать?





«Идеальная» общая анестезия в акушерстве:

- Простота и удобство.
- Легкая управляемость:
  - ✔ Быстрая индукция.
  - ✔ Возможность быстрого изменения глубины наркоза.
  - ✔ Быстрое пробуждение.
- Стабильность системной и регионарной гемодинамики.
- Отсутствие влияния на плод и тонус матки.

Клинические эффекты севофлурана

Характеристика	Галотан	Изофлюран	Энфлюран	Десфлюран	Севофлюран
Влияние на сердечно-сосудистую систему					
Сократимость	↓↓↓	↓	↓↓	минимальное	↓
Частота сердечных сокращений	↓↓	↑↑	↑	↑↑	не влияет
Сосудистое сопротивление	↓	↓↓	↓	↓↓	↓
Артериальное давление	↓↓	↓↓	↓↓	↓↓	↓
Коронарное обкрадывание	нет	возможно	нет	нет	нет
Спланхнический кровоток	↓	не влияет	↓	не влияет	не влияет
Сенситизация к катехоламинам	↑↑↑	не влияет	↑	не влияет	не влияет
Влияние на дыхательную систему					
Частота дыхания	↑	↑↑	↑↑	↑↑	↑↑
Дыхательный объем	↓	↓↓	↓↓↓	↓↓	↓
$PaCO_2$	не влияет	↑↑	↑↑↑	↑↑	↑
Прочие эффекты					
Церебральный кровоток	↑↑↑	↑	↑	↑	↑
Потребность мозга в кислороде	↓	↓	↓	↓	↓
ЭЭГ-активность	подавление	подавление	эпилептиформная	подавление	подавление
Расслабление матки	умеренное	умеренное	умеренное	умеренное	умеренное
Потенцирование миоплегии	умеренное	значимое	значимое	значимое	значимое
Анальгезия	умеренная	умеренная	умеренная	умеренная	умеренная

(Update in Anaesthesia. WFSA, 2008 / Недашковский Э.В., Кузьков В.В., 2010)

д.м.н. Овезов А.М.

Клинические эффекты севофлурана

ARTICLE IN PRESS

OBSTETRIC ANAESTHESIA

General anaesthesia for operative obstetrics

Rachel Davison

Rowena Cockerham

Learning objectives

After reading this article, you should be able to:

- discuss the specific increased risks posed by general anaesthesia in the obstetric population
- explain the importance of preoxygenation, aspiration prophylaxis and proper positioning in obstetric patients
- list the pros and cons of cricoid pressure

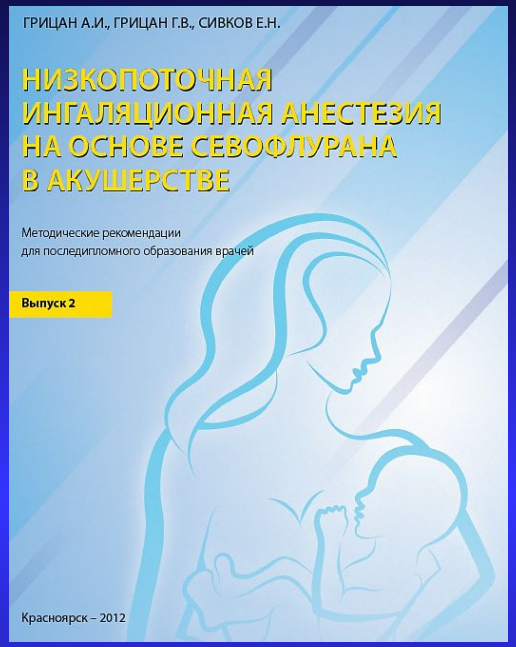
Maintenance of anaesthesia

The goals of anaesthetic maintenance are adequate feto-maternal oxygenation with normocapnia for pregnancy (4–4.2 kPa), adequate depth of anaesthesia and minimal effects on both uterine tone and the neonate. Hypotension should be minimized because the uteroplacental unit has no autoregulation and fetal hypoxia may result. Volatile anaesthetic agents are most commonly used but no one agent is superior to another. Minimum alveolar concentration (MAC) is reduced in pregnancy by 25–40%, particularly if there has been prior labour, but end tidal vapour concentration should be maintained at more than 0.8 MAC to prevent awareness.[7] However, a MAC >1 may result in neonatal depression from transplacental drug transfer and a dose-dependent reduction in uterine tone and contractility.[6] Nitrous oxide may be added to reduce the amount of volatile agent required to prevent awareness whilst limiting the effect on uterine tone.

МАК снижается при беременности на 25-40%, поэтому достаточно использовать концентрацию в 0,8 МАК, чтобы поддерживать нужную глубину анестезии и избежать интранаркозного пробуждения. Использование концентраций более 1 МАК в акушерстве чревато депрессией плода и токолитическим эффектом.

Please cite this article in press as: Davison R, Cockerham R, General anaesthesia for operative obstetrics, Anaesthesia and intensive care medicine (2016), http://dx.doi.org/10.1016/j.mpaic.2016.05.003

Влияние севофлурана на новорожденного



ОЦЕНКА ВЛИЯНИЯ СЕВОФЛУРАНА НА ПЛОД И НОВОРОЖДЕННОГО

Таблица 4. Оценка газового состава пуповинной крови у новорожденных

Показатели	Группы сравнения		p
	I (севофлуран)	II (ТВА)	
pH, ед	7,32±0,02	7,28±0,01	>0,05
PCO_2, мм рт.ст.	38,2±1,8	39,7±1,9	>0,05
PO_2, мм рт.ст.	30,8±2,5	24,0±2,1	<0,05
SaO_2, %	63,7±3,4	54,6±2,2	<0,05
O_2ct, мл/100 г	11,1±1,2	8,5±0,8	<0,05

Для оценки влияния анестетиков на плод и новорожденного, проведен сравнительный анализ газового состава пуповинной крови при рождении ребенка при индукции севофлураном (I группа) и с помощью неингаляционных (внутривенных) анестетиков (тиопетал натрия, кетамин+фентанил по показаниям) (II группа).

Следовательно, при индукции севофлураном наблюдается достоверно более высокий уровень оксигенации пуповинной крови, чем при индукции неингаляционными (внутривенными) анестетиками.

д.м.н. Овезов А.М.

Влияние севофлурана на кормление грудью

Pediatric Anesthesia

Pediatric Anesthesia ISSN 1155-5645

REVIEW ARTICLE

Safety of the breast-feeding infant after maternal anesthesia

Priti G. Dalal[1], Jodi Bosak[2] & Cheston Berlin[3]

Table 1 Transfer of commonly used intravenous anesthetic agents in breast milk, NA, not available

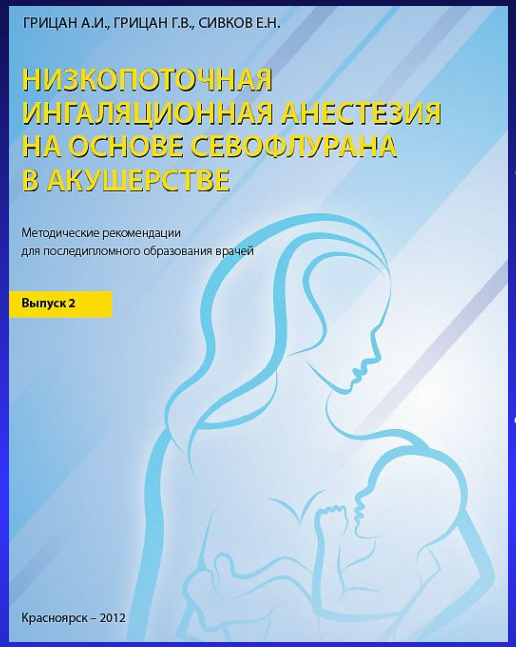
Drug	Dose (mg kg^{-1})	Percentage transferred in breast milk	Milk or colostrum: plasma concentration ratio
Propofol (29–32)	1.5–2.5	0.025%	<1
Thiopentone (29,33,34)	3–5	NA	0.6
Etomidate (29,34)	0.2–0.4	NA	1.2 at 30 min
Ketamine (29)	1–2	NA	NA

Pediatric Anesthesia **24** (2014) 359–371

Volatile anesthetic agents

There are no data related to actual levels measured in the human milk of women administered a volatile anesthetic agent. Desflurane or sevoflurane levels in milk most likely have no clinical importance 24 h after anesthesia due to rapid washout. There have been potential safety issues for occupational exposure to inhaled anesthetic gases (primarily nitrous oxide). The National Institute for Occupational Safety and Health Administration (NIOSH, Centers for Disease Control and Prevention, USA) recommends no worker be exposed to >2 ppm (ceiling concentrations) of the halogenated vapors over a period of 1 h (http://www.cdc.gov/niosh/docs/1970/77-140.html). The use of scavenging systems and minimizing the leaks and spills can help reduce potential risks.

Кесарево сечение и севофлуран



Методика анестезии:

1. Быстрая последовательная индукция (ТВА или ингаляционная)
2. Начальная концентрация севофлурана = 8 об% при FGF = 8 л/мин, через 1 минуту снижается до 2,0 об%.
3. После 5–8 аппаратных дыхательных циклов в данной концентрации севофлурана, поток кислорода снижается до 4 л/мин, после чего делается кожный разрез.
4. В течение двух минут поток кислорода уменьшается до 2 л/мин, далее – до 1 л/мин.
5. После извлечения плода внутривенно вводится фентанил 0,1–0,2 мг и миорелаксант; а концентрация анестетика устанавливается на уровне 1,5–2,1 об% (0,75-1 МАК).

5. В процессе анестезии, в зависимости от этапа операции, концентрация анестетика изменяется в пределах 1,5–2,1 об%. На этапе санации брюшины дополнительно вводится 0,1 мг фентанила, как правило, больше наркотических анальгетиков не требуется, если операция по техническим причинам не задерживается.
6. При использовании закиси азота (N_2O:O_2=1:1; 0,5:0,5 л/мин или 1,0:1,0 л/мин), концентрация севофлурана снижается до 1,0–1,5 об%.
7. На этапе накладывания швов на кожу в течение одной минуты концентрация севофлурана уменьшается до полного его отключения, по завершении операции подача кислорода увеличивается до 8 л/мин.

Кесарево сечение и севофлуран

Anesthesia & Clinical Research

Abreu et al., J Anesth Clin Res 2012, 3:5
http://dx.doi.org/10.4172/2155-6148.1000212

Case Report Open Access

Anesthesia for a Cesarean Section in a Patient with a Congenital Heart Disease and Complete Placenta Previa

Abreu LA[1], Madruga B[1], Gouvea J[1], Zapata Z[1] and Bersot CD[2]*

[1]Department of Anesthesia at the Pedro Ernesto University Hospital, RJ, Brazil
[2]Department of Anesthesia at the Lagoa Federal Hospital, RJ, Brazil

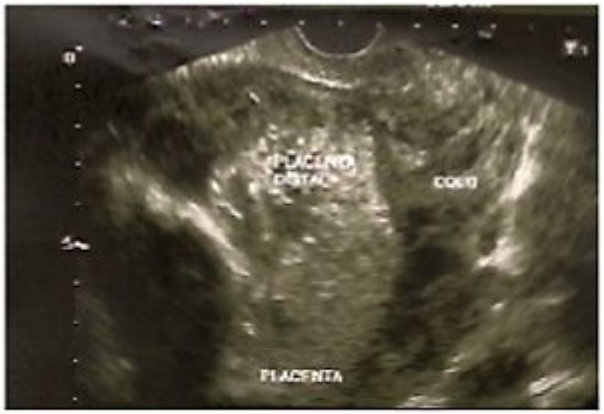


Figure 1: Complete Placenta Previa

Echocardiogram reported CHD presenting a transposition of great arteries (TGA), pulmonary stenosis, ventricular septum defect (VSD) and hypoplasic left ventricle, resuming in a complex congenital cardiac disease with preserved global systolic function and no signs of valvular vegetation. She had a history of endocarditis in 2005.

General anesthesia in rapid sequence was started. Pre-oxigenation for 3 minutes was given and induction was performed: Lidocaine 40mg was followed by Etomidate 15mg, Alfentanyl 1000µg, succinylcholine 80mg waited for 30 second and intubated with a cuff 7.5mm tube using sellick maneuver, anesthesia was maintained with sevoflurane (1 MAC). The newborn was delivered quickly with APGAR score 8 after 5minutes.

Кесарево сечение и севофлуран

J Anesth
DOI 10.1007/s00540-016-2304-0

CLINICAL REPORT

Anesthesia management of cesarean section in parturient with anti-*N*-methyl-D-aspartate receptor encephalitis: a case report

Zhimin Liao[1,2] · Xiaoqin Jiang[1,2] · Juan Ni[1,2]

Received: 21 September 2016 / Accepted: 23 December 2016

Быстрая последовательная индукция: этомидат 14 мг, ремифентанил 80 мкг и сукцинилхолин 100 мг.
Поддержание анестезии: севофлуран 2% + ремифентанил 0,1 мкг/кг/мин.

General anesthesia was prepared. After rapid sequence induction with etomidate 14 mg, remifentanil 80 μg and succinylcholine 100 mg, a 7.0-mm ID tracheal tube was intubated. The infant was born 3 min later and weighed 2250 g. The parturient was administered 3 mg midazolam, 20 μg sufentanil and 10 mg cisatracurium. Anesthesia was maintained with 2% sevoflurane and 0.1 μg/kg/min remifentanil. The patient's vital signs were stable and BIS was 40–50 throughout surgery. The Apgar scores were 9, 10, 10 at 1, 5 and 10 min after delivery. The obstetrician explored the abdomen and the pelvis. Teratoma or other masses were not found. After the surgery, the patient had 4 switches in train-of-four testing with a 50-mA current.

Кесарево сечение и севофлуран

Rev Bras Anestesiol. 2016;66(4):418–422

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CLINICAL INFORMATION

Perioperative management of a morbidly obese pregnant patient undergoing cesarean section under general anesthesia – case report☆

CrossMark

Case report: Pregnant woman in labor, 35 years of age, body mass index 59.8 kg/m^2. Caesarean section was indicated due to the presumed fetal macrosomia. The patient refused spinal anesthesia. She was placed in the ramp position with cushions from back to head to facilitate tracheal intubation. Another cushion was placed on top of the right gluteus to create an angle of approximately 15° to the operating table. Immediately before induction of anesthesia, asepsis was carried out and sterile surgical fields were placed. Anesthesia was induced in rapid sequence, with Sellick maneuver and administration of remifentanil, propofol, and succinilcolina. Intubation was performed using a gum elastic bougie, and anesthesia was maintained with sevoflurane and remifentanil. The interval between skin incision and fetal extraction was 21 minutes, with the use of a Simpson's forceps scoop to assist in the extraction. The patient gave birth to a newborn weighing 4850 g, with Apgar scores of 2 in the 1st minute (received positive pressure ventilation by mask for about 2 minutes) and 8 in the 5th minute. The patient was extubated uneventfully. Multimodal analgesia and prophylaxis of nausea and vomiting was performed. Mother and newborn were discharged on the 4th postoperative day.

Figura 1 Gestante de 35 anos, com 169 kg e 168 cm.

Интранаркозное пробуждение

Anaesthesia 2018, 73 (Suppl. 1), 61–66 doi:10.1111/anae.14141

Review Article

Complications in obstetric anaesthesia

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ELSEVIER

Best Practice & Research Clinical Anaesthesiology
Vol. 21, No. 3, pp. 327–343, 2007
doi:10.1016/j.bpa.2007.05.002
available online at http://www.sciencedirect.com

BEST PRACTICE & RESEARCH

4

Incidence of and risk factors for awareness during anaesthesia

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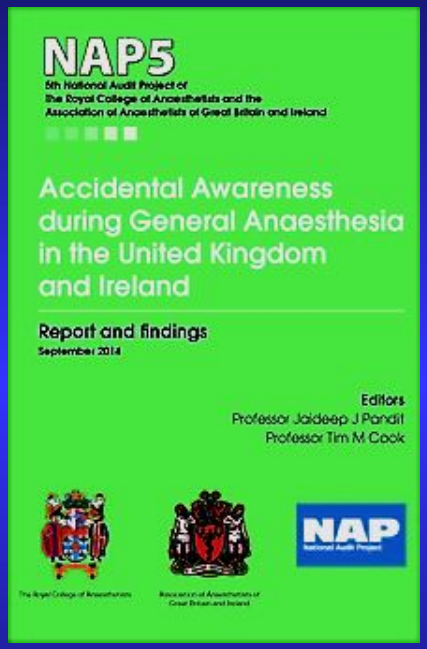
Accidental awareness under general anaesthesia

Accidental awareness under general anaesthesia occurs when a patient experiences a period of recalled consciousness at a time when they think they should be under the influence of general anaesthesia; it is nearly always associated with the use of neuromuscular blockers, preventing the patient from alerting those caring for them. The overall awareness rate for all types of surgery is 1:19,000 [21].

Awareness is more common in patients having obstetric procedures under a general anaesthetic. The 5th National Audit Project (NAP5) carried out by the Royal College of Anaesthetists over a period of one year found that the incidence of awareness in obstetric patients for all procedures was 1:1200, but for caesarean sections, it was 1:670 [21].

Интранаркозное пробуждение

CHAPTER 16 | AAGA in obstetric anaesthesia



	Estimated annual	AAGA	
	Number of cases	Number	Incidence
All obstetric GAs	17,000	14	1:1,200 (0.08%)
CS under GA	8,000	12	1:670 (0.15%)
GA for other procedures	9,000	2	1:4,500 (0.02%)

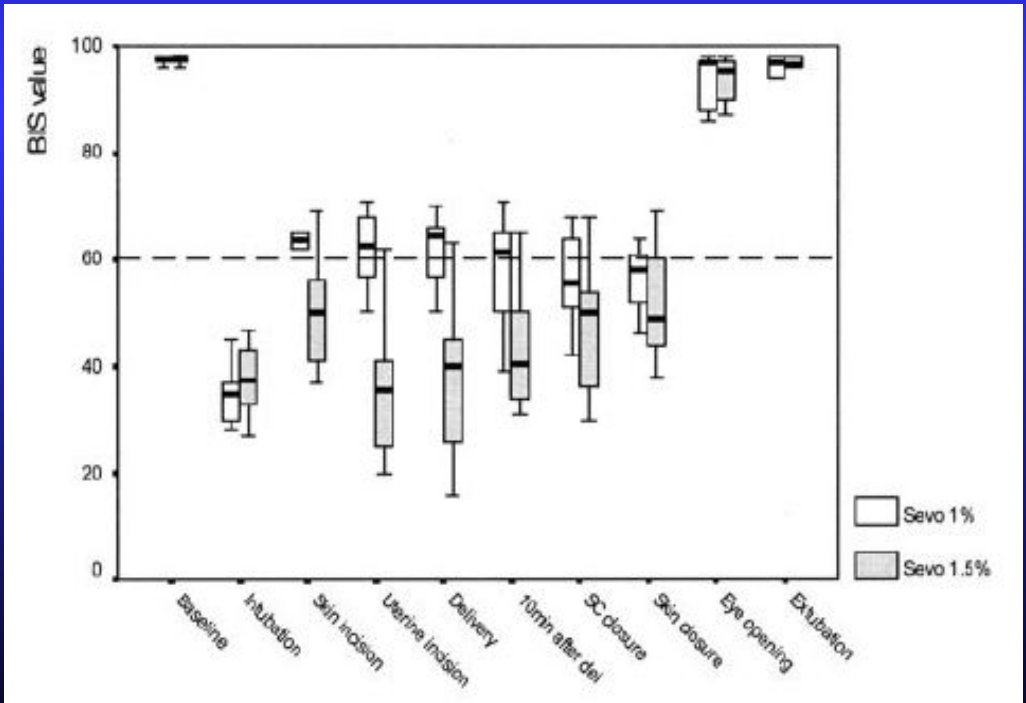
Общая анестезия в акушерстве включает в себя большинство факторов риска для развития интранаркозного пробуждения: использование быстрой последовательной индукции тиопенталом в недостаточной дозировке, нервно-мышечная блокада во время интубации трахеи в совокупности с относительно высоким уровнем ожирения и частотой трудных дыхательных путей, малый промежуток времени от начала анестезии до извлечения плода, слишком поверхностная анестезия без анальгезии.

Интранаркозное пробуждение: профилактика

Bispectral Index Values at Sevoflurane Concentrations of 1% and 1.5% in Lower Segment Cesarean Delivery

Ki Jinn Chin, MBBS, and Seow Woon Yeo, MMed

From the Department of Obstetric and Gynecological Anaesthesia, KK Women's and Children's Hospital, Singapore



Anesth Analg 2004;98:1140–4

При кесаревом сечении (индукция тиопентоном 4,5 мг/кг) дозировка севофлурана должна быть не менее 2 МАК пробуждения (1,5%), что надежно предотвращает интранаркозное пробуждение при адекватной анестезиологической защите и отсутствии влияния на плод (Апгар = 8,5 б. на 1 минуте и 9 б. - на 5-ой)

Интранаркозное пробуждение: профилактика

British Journal of Anaesthesia **112** (5): 871–8 (2014)
Advance Access publication 13 February 2014 · doi:10.1093/bja/aet483

BJA

NEUROSCIENCES AND NEUROANAESTHESIA

Survey on the adequacy of depth of anaesthesia with bispectral index and isolated forearm technique in elective Caesarean section under general anaesthesia with sevoflurane†

F. Zand, S. M. R. Hadavi*, A. Chohedri and P. Sabetian

Results. Positive IFT responses were seen in 41%, 46%, and 23% of the parturients at laryngoscopy, intubation, and skin incision, respectively. BIS could not reliably differentiate between IFT responders and non-responders during these three stages. The receiver operating characteristic curve cut-off points for BIS to predict IFT responders with 100% sensitivity were 34, 37, and 27, respectively, for these stages. In all stages of the operation *after* skin incision, more than 90% of parturients had no IFT test response, and BIS values between 40 and 63 were associated with negative IFT results. During a structured interview within 12–24 h after the operation, no patient had evidence of explicit recall of intraoperative events.

Даже при отставании BIS-мониторинга на ранних этапах кесарева сечения от истинной глубины угнетения сознания (интубация, разрез, извлечение плода), использование ингаляционной анестезии севофлураном (1,5 об% - 0,8 МАК) предотвращает развитие интранаркозного пробуждения.

Ингаляционная индукция

Sevoflurane Anesthesia for Elective Cesarean Section

Akira ASADA, Mitsugu FUJIMORI,
Shoji TOMODA* and Atsuo HIDAKA*

Sevoflurane anesthesia was given to sixteen women who had been scheduled for elective cesarean section. The maternal systolic blood pressure significantly decreased during the anesthesia induction. Both the anesthesia induction and emergence were smooth and rapid. These findings were supported partially by the pharmacokinetic analysis of sevoflurane concentration in the maternal artery and expired gas mixture. Spontaneous uterine contractions were good in 12 patients, fair in two and poor in two. The measured blood loss was 752 ± 257 ml including amniotic fluid. No blood transfusion was given to any patient. The median value of the Apgar score at one minute was seven (range three to nine). No neonate was intubated for resuscitation. No abnormal maternal laboratory data were found, including liver and kidney function tests and blood cell counts one week after the operation. No adverse effect of sevoflurane on the neonate was found one week after the delivery and three months after the discharge. (Key words: Sevoflurane, Cesarean section, Pharmacokinetics)

(Asada A, Fujimori M, Tomoda S et al.: Sevoflurane Anesthesia for elective cesarean section. J Anesth 4: 66–72, 1990)

Ингаляционная индукция

Anesthesiology
1999; 90:1475–6

Sevoflurane Induction for Emergency Cesarean Section in a Parturient in Status Asthmaticus

Jocelyn C. Que, M.D., D.P.B.A., Vivienne O. Lusaya, M.D., D.P.B.A.†*

Anesthesiology 2001; 95:553–5

Mask Induction with Sevoflurane in a Parturient with Severe Tracheal Stenosis

Emily F. Ratner, M.D., Sheila E. Cohen, M.B., Ch.B., F.R.C.A.,† Yasser El Sayed, M.D.,‡ Maurice Druzin, M.D.§*

Методология VIMA севофлураном нередко служит методом выбора в трудных клинических ситуациях в оперативном акушерстве, начиная с 1990 года.

Inhalation induction of anesthesia with sevoflurane for emergency Cesarean section in an amphetamine-intoxicated parturient without an intravenous access

Sir,

I report a case of a parturient without an intravenous access who presented with placental abruption and severe fetal bradycardia following acute amphetamine intake and required emergency Cesarean section under general anesthesia.

Acta Anaesthesiol Scand 2003; 47: 1180–1182

Ингаляционная индукция

Anesthesiology
1997; 86:1392-4

Sevoflurane Inhalation Induction for Emergency Cesarean Section in a Parturient with no Intravenous Access

David J. Schaut, M.D., Rajesh Khona, M.D.,† Jeffrey B. Gross, M.D.‡*

International Journal of Obstetric Anesthesia (2002) 11, 296–300

doi:10.1054/ijoa.2002.0961, available online http://www.idealibrary.com on IDEAL®

CASE REPORT

Sevoflurane induction for emergency caesarean section: two case reports in women with needle phobia

G. R. Simon, C. J. Wilkins, I. Smith

Departments of Anaesthesia, North Staffordshire Hospital, Stoke-on-Trent and The Royal Wolverhampton NHS Trust, Wolverhampton, UK

SUMMARY. Needle phobia is an unusual but well-recognised clinical entity. It is claimed that it may affect up to 10% of the general population and may prevent potential patients from seeking medical care, thereby reducing its apparent incidence in the hospital population. Its occurrence in a parturient requiring urgent caesarean section presents special challenges to the anaesthetist. This report discusses the clinical, ethical and medico-legal dilemmas presented by two such cases that were successfully managed by inhalational induction of general anaesthesia using sevoflurane. © 2002 Elsevier Science Ltd. All rights reserved.

Ингаляционная индукция

Update on general anaesthesia for Caesarean section

South Afr J Anaesth Analg 2011;17(1)

Dyer RA
Deputy Head, Department of Anaesthesia, Faculty of Health Sciences, University of Cape Town
Correspondence to: Prof Rob Dyer, e-mail: rob.dyer@uct.ac.za

Inhalational agents

Sevoflurane and desflurane have been evaluated for maintenance of GA with no adverse maternal or neonatal effects. Sevoflurane was not associated with more rapid recovery than isoflurane.[9] Sevoflurane has also been successfully used for induction of anaesthesia for CS, in patients with needle phobia, or absence of venous access.

Ингаляционная индукция: методология

Методика с предварительным заполнением контура:

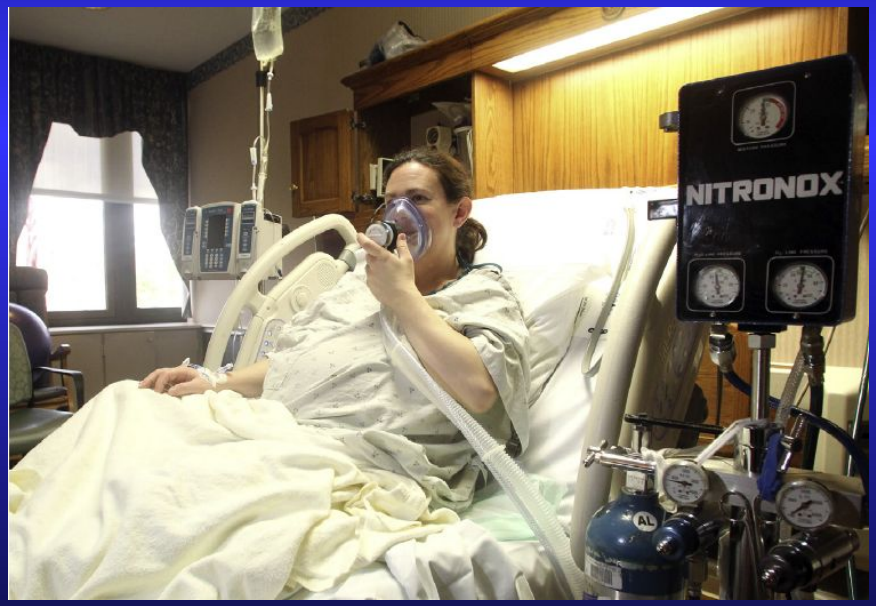
1. Заполняют контур наркозного аппарата смесью, содержащей не менее 6 об.% Севорана:
   - ✔ Закрывают тройник дыхательного контура;
   - ✔ Устанавливают на испарителе 8 об.% и поток кислорода 8 л/мин.
   - ✔ Ждут 1,5 мин или 7-8 раз сжимают мешок-резервуар после его наполнения.
2. Накладывают маску на лицо пациента, просят дышать спокойно и ровно.
3. Плотно удерживают маску на лице пациента, наблюдая за состоянием его сознания, частотой и глубиной дыхания, показателями кровообращения
4. В течение 1 минуты наступает утрата сознания, начинается и заканчивается период ажитации.
5. Индукция закончена.

д.м.н. Овезов А.М.

Ингаляционная анальгезия родов

Inhaled Nitrous Oxide for Labor Analgesia

Sarah A. Starr, MD*, Curtis L. Baysinger, MD



Ингаляция закиси азота с кислородом (1:1, Энтонокс) - наиболее распространенный вид ингаляционной аутоанальгезии в родах. Используется в 50% случаев в Финляндии, Норвегии, Англии, Австралии и Новой Зеландии; в 60% - в Великобритании и в 70% родов в Швеции.

The first use of nitrous oxide for obstetrics is credited to Russian physician Stanislov Klikovich, who developed a machine that delivered 80% nitrous oxide with 20% oxygen.[18] Klikovich published the first study of nitrous oxide in laboring women in 1881,

Ингаляционная анальгезия родов

Society for Obstetric Anesthesia and Perinatology

Section Editor: Cynthia A. Wong

Nitrous Oxide for the Management of Labor Pain: A Systematic Review

Frances E. Likis, DrPH, NP, CNM,* Jeffrey C. Andrews, MD,*† Michelle R. Collins, PhD, CNM, RN-CEFM,§ Rashonda M. Lewis, JD, MHA,*† Jeffrey J. Seroogy, BS,* Sarah A. Starr, MD,‖ Rachel R. Walden, MLIS,¶ and Melissa L. McPheeters, PhD, MPH*†

RESULTS: We identified a total of 58 publications, representing 59 distinct study populations: 2 studies were of good quality, 11 fair, and 46 poor. Inhalation of nitrous oxide provided less effective pain relief than epidural analgesia, but the quality of studies was predominately poor. The heterogeneous outcomes used to assess women's satisfaction with their birth experience and labor pain management made synthesis of studies difficult. Most maternal adverse effects reported in the literature were unpleasant side effects that affect tolerability, such as nausea, vomiting, dizziness, and drowsiness. Apgar scores in newborns whose mothers used nitrous oxide were not significantly different from those of newborns whose mothers used other labor pain management methods or no analgesia. Evidence about occupational harms and exposure was limited.

CONCLUSIONS: The literature addressing nitrous oxide for the management of labor pain includes few studies of good or fair quality. Further research is needed across all of the areas examined: effectiveness, satisfaction, and adverse effects. (Anesth Analg 2014;118:153–67)

Ингаляционная анальгезия родов

Box 2
Maternal side effects of nitrous oxide administration: contraindications to use

Maternal side effects

- Nausea and vomiting
- Dizziness
- Drowsiness
- Respiratory depression
- Unconsciousness

Contraindications

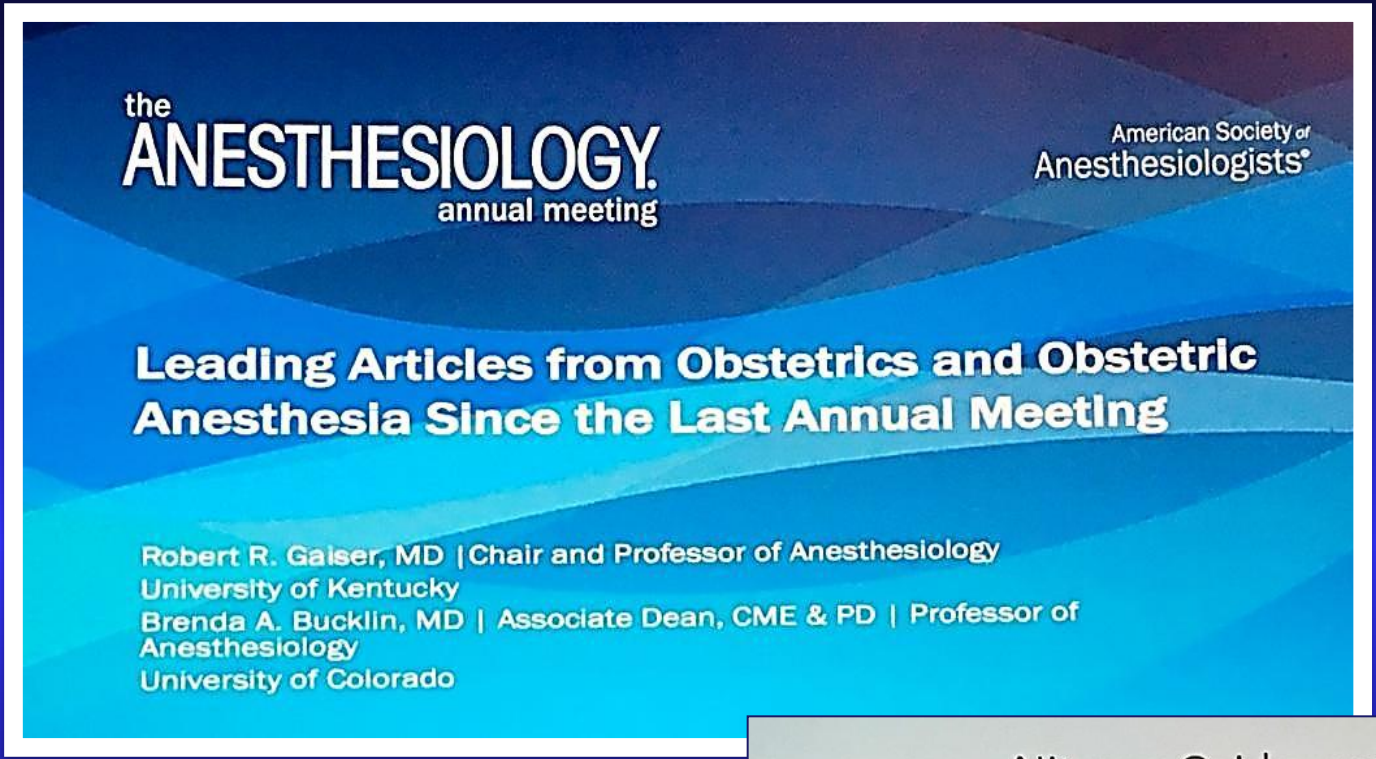
- Absolute
  - Recent pneumothorax
  - Recent retinal surgery
  - Recent middle ear or sinus infection
  - Known vitamin B12 deficiency
- Relative
  - Pernicious anemia
  - Extensive bowel resection due to Crohn disease
  - Vegans who do not consume legumes
  - Methionine synthetase deficiency or reduction

Should Nitrous Oxide Be Used for Laboring Patients?

Michael G. Richardson, MD[a,*], Brandon M. Lopez, MD[b], Curtis L. Baysinger, MD[a]

Anesthesiology Clin 35 (2017) 125–143
http://dx.doi.org/10.1016/j.anclin.2016.09.011

Ингаляционная анальгезия родов



Robert Gaiser, MD
Lexington, KY

ASA | Anesthesiology
Annual Meeting
Boston, MA, USA,
20-25 October 2017

Nitrous Oxide, anyone?

J Clin Anesth 2017; 40: 45

- What are the characteristics of women who chose nitrous?
- 146 (3%) women chose nitrous.
- 72% were nulliparous; > 50% wanted a “nonmedical” delivery.
- Conversion to neuraxial: 63%
- Only a small number opted to use nitrous oxide during labor.

Bottom line: Analgesia was minimal, and most converted to neuraxial analgesia.

Обезболивание родов севофлураном

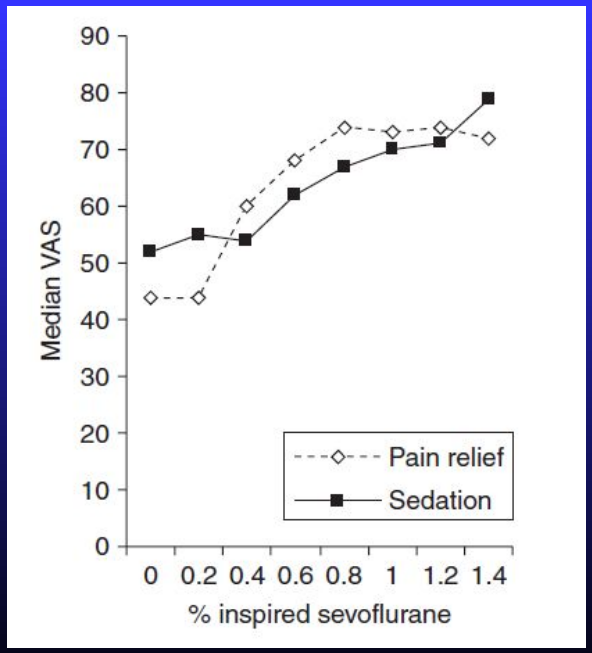
British Journal of Anaesthesia **98** (1): 105–9 (2007)
doi:10.1093/bja/ael326

BJA

OBSTETRICS

Analgesia with sevoflurane during labour: I. Determination of the optimum concentration†‡

S. T. Yeo[1,3]*, A. Holdcroft[1], S. M. Yentis[1] and A. Stewart[2]



Оптимальная концентрация севофлурана для обезболивания первого периода родов - 0,8%. Эта концентрация обеспечивает необходимый запас прочности и уравновешивает уровень седации и хорошей анальгезией.

Conclusions. We concluded that the optimal sevoflurane concentration in labour was 0.8%. This concentration allows a safety margin and balances the risk of sedation with the benefit of pain relief in labour.

Обезболивание родов севофлураном

Contents lists available at ScienceDirect

Trends in Anaesthesia and Critical Care

journal homepage: www.elsevier.com/locate/tacc

REVIEW

Hazards of labour pain and the role of non-neuraxial labour analgesia

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[b] Barts and the London School of Medicine and Dentistry, Queen Mary University of London, United Kingdom

Trends in Anaesthesia and Critical Care 4 (2014) 109–114

Севофлуран в дозировке 0,8 об% (0,4 MAC) с успехом используется для ингаляционной анальгезии, контролируемой пациентом в первом периоде родов, гораздо чаще, чем Энтонокс, несмотря на преобладание седативных эффектов препарата над анальгетическими.

Sevoflurane in oxygen (0.8% sevoflurane with oxygen) has been used in labour analgesia. MAC of sevoflurane is 2. Hence 0.8% sevoflurane would constitute to 0.4 MAC. This would be sedative MAC or MAC sedate. It can be administered as patient controlled inhalational analgesia to the parturient. Sevoflurane has no analgesic properties hence the labour analgesia is thought to be caused principally because of the sedative effect rather than the analgesic effect. Its advantages are the sevoflurane's quick onset and offset and better acceptance by the parturients as it is not pungent to smell. There is some evidence to suggest that sevoflurane in oxygen provides useful pain relief during the 1st stage of labour and is greater as compared to Entonox® and although greater sedative effects were observed with sevoflurane than Entonox®, it was preferred to Entonox®.[39]

Whether or not volatile anaesthetics interfere with the progress of labour, by inhibiting uterine contractility remains to be determined with sevoflurane as well.

Обезболивание родов севофлураном

PR210

SEVONOX STUDY: A COMPARISON OF 0.8% SEVOFLURANE & ENTONOX FOR LABOUR ANALGESIA

K. W. S. Ng[1,*], Y. Chan[1], I. I. Shariffuddin[1], C. C. W. Yim[1], I. L. Md Latar[1], R. Eltringham[2], Y. Moy[1]

Results: Two parturients dropped out of the study. Of the remaining 48 parturients, 24 were randomized into each arm. As seen in Table 1, there were no significant differences in median VAS scores for Overall Pain experience, Overall Recall and Pain Scores at the first and last hour of labour between groups. There were no significant differences in adverse effects between groups although the numbers were greater on the Entonox® arm.

Table 1: Summary of Parameters

Parameter	Sevoflurane N=24	Entonox N=24	P Value
Median(IQR [Range])			
Overall Pain Score	4.5 (2.5-9.0 [0.0-10.0])	5.0 (2.0-9.5 [1.0-10.0])	0.908
Pain score at first hour	5.5 (4.0-7.0 [2.0-10.0])	6.0 (4.0-7.8 [0.0-10.0])	0.950
Pain score at last hour	8.0 (8.0-10.0 [2.0-10.0])	9.0 (8.0-10.0 [5.0-10.0])	0.616
Overall Recall	8.0 (7.3-10.0 [0.0-10.0])	8.5 (6.0-10.0 [4.0-10.0])	0.940
Patients(%)			
Instrumental Delivery	1.0 (4.2%)	5.0 (20.8%)	0.097
LSCS	6.0 (25.0%)	2 (8.3%)	0.121
Nausea and Vomiting	1.0 (4.2%)	4.0 (16.7%)	0.156
Epidural	None	2.0 (8.3%)	0.399

Conclusion: From our study, it can be seen that 0.8% Sevoflurane is comparable to Entonox with a similar safety profile. However, given the portability of the Sevoflurane inhaler, its use in remote areas where Entonox is unavailable or contraindicated makes it a viable alternative for labour analgesia.

Обезболивание родов севофлураном

Вес
2290 г
Рост
47 см
Апгар
7-8

Беременность 37-38 недель.
I срочные самопроизвольные роды.
ХБП V стадии, программный диализ.
Вторичносморщенные почки.
ХГН: IgA-нефропатия.

Цит. по презентации Е.Ю. Упрямовой, 2018

Ингаляционные анестетики – нужны ли они в акушерстве?

Современная ингаляционная анестезия способна решить ряд проблем акушерской анестезиологии, связанных с использованием общей анестезии: интранаркозного пробуждения, иглофобии,, обеспечение пациенток с низкими резервами, аутоанальгезия в родах и др.

д.м.н. Овезов А.М.

БЛАГОДАРЮ ЗА ВНИМАНИЕ!