Anestesimetoder när det är bråttom vid sectio

Lisa Lundström SFAI 2024

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Valmöjligheter

- Generell Anestesi, med el utan opioid
- Snabb spinal: Rapid sequence SPA
- Aktiv, utvärderad, pg EDA- fyll på

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Säkerhet

- Id band
- Kort checklista
- Preox medan man SPA/EDA/checklista

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Larmsnitt/urakut/omedelbart/Cat 1

Urakut (starta inom 15 min)

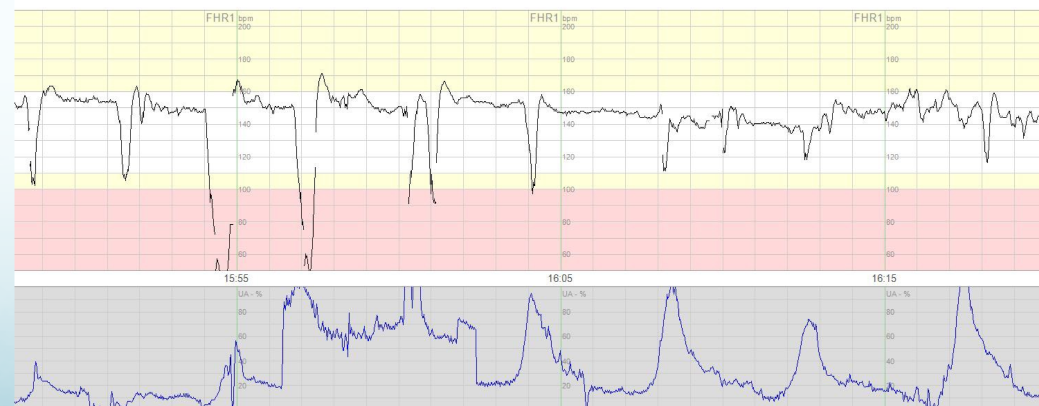
Diagnoser:

- barnet blöder, vasa previa
- ablatio
- navelstängsprolaps ffa preterm,
- uterus ruptur
- Maternell kollaps (ej eklampsi)

Akut brådskande (ofta DDI inom 30 min)

Diagnoser:

- de flesta CTG förändringar



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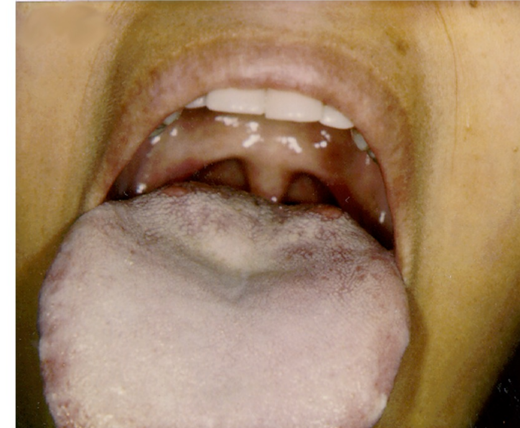
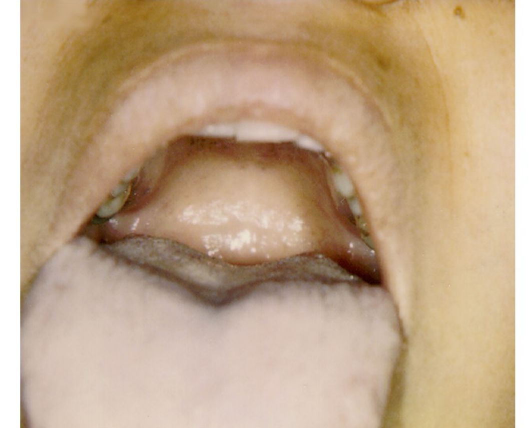
Generell Anestesi- KAN VARA FARLIGT

- Kan uppnås på 4,5 min om pat finns på plats, men vilken tid menas?

- D to Delivery Intervall DDI
- D to Incision Intervall: DII
- (Incision to delivery)
- Vad finns i SPOR?
  - Partus förs ej in
  - **Knivstart**-ja dvs DII
  - Decision finns ej måste (föras in manuellt, larmtid/opanmälan?)

Capillary Engorgement
- Increased Class IV, Facial Edema & Swollen Tongue
- Further Engorgement with Labor and Active Pushing

Pinkington et al., BJA 1995; Rocke et al., Anesth 1992; Kodali et al., Anesth 2008

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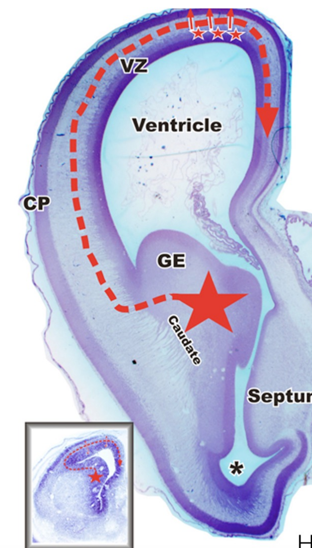
GA- Och kanske inte BÄTTRE FÖR BARNET?

Fetal Morbidity Worse with GA

Emergent	Design	UA pH	Agpar <8	Intubation
Gale '82	R			GA worse
Marx '84	P		GA worse	
Ong '89	R		GA worse	GA worse
Elective	**Design**	**UA pH <7.20**	**Apgar**	**Ventilation**
Evans '89	R	RA worse	GA worse	
Dick '92	P	GA worse	RA worse	GA worse
Ratcliffe '93	R		GA worse	
Roberts '95	R	RA worse	GA worse	GA worse
Mueller '97	R	RA worse	RA worse	GA worse
Sendag '99	R	RA worse	RA worse	
Kolatat '99	P	GA worse	GA worse	

Fetal Morbidity Worse with GA



- Neural Stem/Progenitor Cells (NPCs)
- Neuron Creation, Migration, Differentiation, Synapsis Formation, Reorganization
- GABA agonism
  NMDA antagonism

Jevtovic-Todorovic V, J Neurosci 2003
Soriano S, Anesth 2005; BMJ 2019; A&A 2020
Palanisamy A, et al. Anesth 2011; Behav Brain2017
Hooijamans CR, SR + Meta. Nature Scientific Reports 2023

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SPARA GA till de som verkligen behöver det!

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Regional Anestesi och det FORT..

SPA- rapid sequence Spinal

Anaesthesia
Journal of the Association of Anaesthetists of Great Britain and Ireland

Anaesthesia, 2010, **65**, pages 664–669 doi:10.1111/j.1365-2044.2010.06368.x

ORIGINAL ARTICLE

Rapid sequence spinal anaesthesia for category-1 urgency caesarean section: a case series

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SPA- rapid sequence Spinal

Box 1: Components of the rapid sequence spinal (adapted from reference [4])

- Deploy other staff for intravenous cannulation and monitoring – don't inject spinal till cannula secured.
- Pre-oxygenate during attempt.
- 'No touch' technique – gloves only with glove packet as sterile surface for equipment. Skin prepared with single wipe of 0.5% chlorhexidine solution.
- If no opioid – consider increased dose hyperbaric bupivacaine 0.5% (up to 3 ml); add fentanyl 25 µg if procuring it does not produce unacceptable delay.
- Local infiltration not mandatory.
- One attempt at spinal unless obvious correction allows a second.
- If necessary start surgery when block ≥ T10 and ascending. Be prepared to convert to general anaesthesia – keep mother informed.

- 25 pat, 22 CTG förändringar 3 navelsträngsprolaps
- 3 behövde sövas, deras barn ute vid 16,20 och 33 min, dvs ingen skillnad jmf lyckad spinal (12%)
- Lite mer LA (2,6ml), bara 6 st fick fentanyl
- 8 min ”anestesi” tid , ink tvätt
- **DDI** 23 min

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Rapid sequence spinal anesthesia versus general anesthesia: A prospective randomized study of anesthesia to delivery time in category-1 caesarean section

Susmita Bhattacharya, Sarmila Ghosh, Uddalak Chattopadhya, Dona Saha, Subrata Bisai, Mrityunjoy Saha

ABSTRACT

Background and Aims: Spinal anesthesia is the preferred technique over general anesthesia in caesarean section. General anesthesia is still used for category-1 emergency caesarean section because of time constraints. We usually follow rapid sequence general anesthesia in

RSS jmf GA?

- 60 st kvinnor randomiserades till rapid spinal el GA på cat 1 sectio
- Längre anestesitid, längre tid till färdigt för kirurgi vid GA.
- Ingen skillnad på Apgar

Table 1: Demographic data and Apgar score

	Group A	Group B	*P* value
Age (years)	28.33±2.35	28.00±3.28	0.653
Height (cm)	153.63±4.64	154.60±5.47	0.450
Weight (kg)	61.46±4.38	61.50±3.93	0.975
Apgar score	7.03±1.99	7.40±1.83	0.461

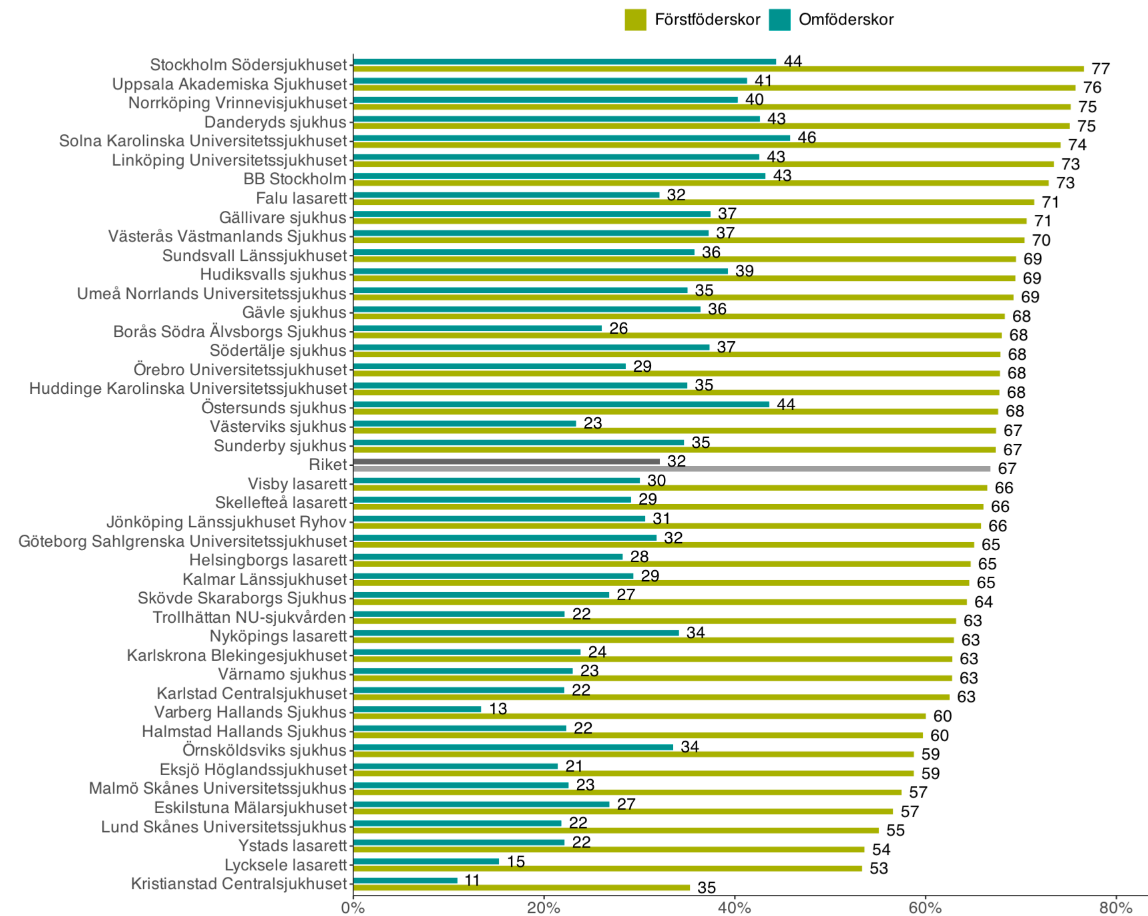
Table 2: Indications of category I caesarean section

Indications	Number of patients in RSGA group (*n*=30)	Number of patients in RSSA group (*n*=30)
Major hemorrhage	18	3
Fetal bradycardia	7	22
Chord prolapse	2	2
Shoulder dystocia	1	2
Uterine rupture	2	1

Table 3: Comparison of time intervals

	Group A (RSGA)	Group B (RSSA)	*P* value
Time for anesthesia	144.80±3.42	131.20±3.40	<0.001
Time for surgical readiness	178.76±4.09	169.93±3.08	<0.001
Incision to delivery time	181.73±6.87	178.26±9.31	0.107
Emergence time	512.13±34.33	222.10±12.80	<0.001

Många kommer ha en EDA..



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Tidslinje med

- Decision EDA ankomst sal SPA Incicsion Deliviery

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EDA- top up, vad har snabbast effekt?

Anaesthesia 2020, 75, 674–682 doi:10.1111/anae.14966

Review Article

Choice of local anaesthetic for epidural caesarean section: a Bayesian network meta-analysis

M. M. Reschke,[1] **D. T. Monks,**[2] **S. S. Varaday,**[3] **Y. Ginosar,**[4] **A. Palanisamy**[3] and **P. M. Singh**[2]

1 Assistant Professor, Division of Obstetric Anesthesia, Johns Hopkins University, Baltimore, MD, USA
2 Assistant Professor, 3 Associate Professor, 4 Professor, Division of Obstetric Anesthesia, Department of Anesthesiology, Washington University in St. Louis, MI, USA

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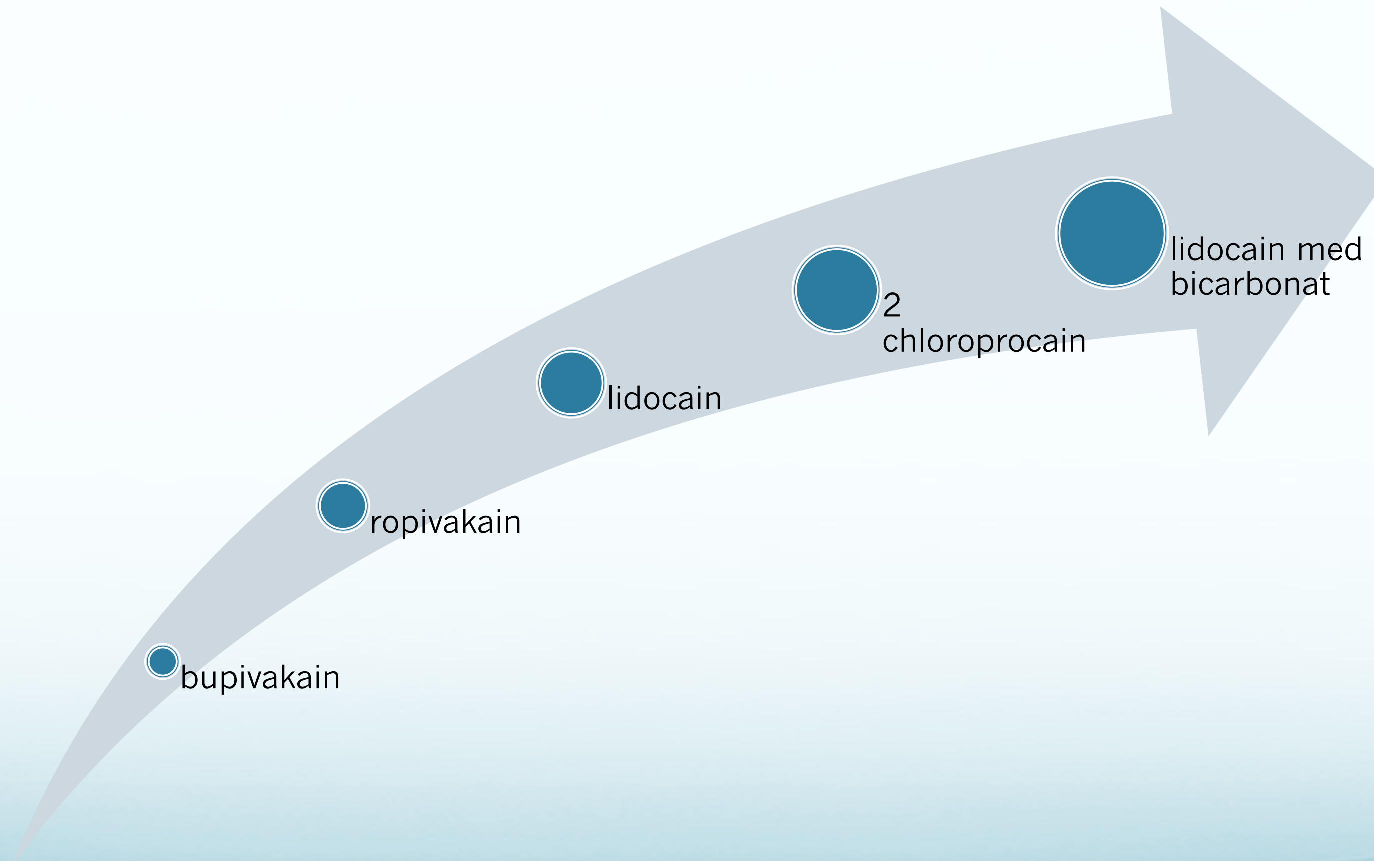
- 14 studier med lidocaine 2%
- 14 med bupivacaine 0,5%
- 6 st med l bupivacaine 0,5%
- 5 st 2- chloroprocaine 3%
- 5 st lidocaine med bic
- 4 st ropivaciaine 0,75%

Snabbast?



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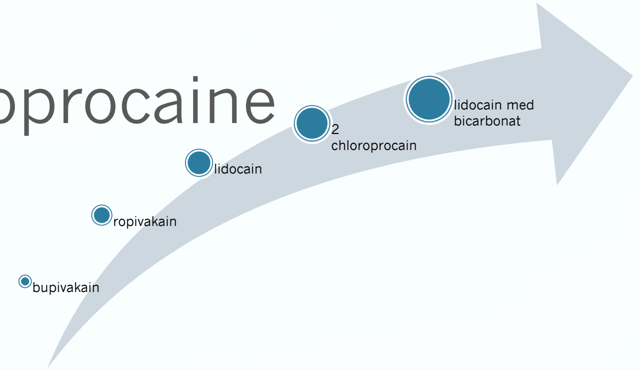
Tid till kir anestesi

- 13,4min - 14,1 min lido med bic och 2 chloroprocaine
- Ropi 17-18 min
- Bupi 19,8 min



- Tänk på att ingen förberedelse behövs, dvs lägga på sida, tvätta etc..

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Chronic Pain Medicine

ORIGINAL CLINICAL RESEARCH REPORT

Comparison of Chloroprocaine Versus Lidocaine With Epinephrine, Sodium Bicarbonate, and Fentanyl for Epidural Extension Anesthesia in Elective Cesarean Delivery: A Randomized, Triple-Blind, Noninferiority Study

Nadir Sharawi, MD, MSc, FRCA,* Prannal Bansal, MD,* Matthew Williams, MD,* Horace Spencer, MS,† and Jill M. Mhyre, MD*

See Article, p 663

BACKGROUND: For emergent intrapartum cesarean delivery (CD), the literature does not support the use of any particular local anesthetic solution to extend epidural analgesia to cesarean anesthesia. We hypothesized that 3% chloroprocaine (CP) would be noninferior to a mixture of 2% lidocaine, 150 µg of epinephrine, 2 mL of 8.4% bicarbonate, and 100 µg of fentanyl (LEBF) in terms of onset time to surgical anesthesia.
METHODS: In this single-center randomized noninferiority trial, adult healthy women undergoing CD were randomly assigned to epidural anesthesia with either CP or LEBF. Sensory blockade (pinprick) to T10 was established before operating room (OR) entry for elective CD. On arrival to the OR, participants received the epidural study medications in a standardized manner to simulate the conversion of "epidural labor analgesia to surgical anesthesia." The primary out-

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Data and Side Effects

	CP (n = 33)	LEBF (n = 34)	P
ry into the operating room, n (%)			
	1 (3)	5 (15)	.296[b]
	7 (21)	5 (15)	
	7 (21)	4 (12)	
	18 (55)	20 (59)	
y into the operating room, n (%)			
	23 (70)	22 (65)	.725[b]
Median (Q1, Q3)	620 (550, 690)	500 (432, 599)	.003[c]
Mean ± SD	655 ± 258	558 ± 269	
Induction to surgery start (min)			
Median (Q1, Q3)			.094[c]
Mean ± SD	22.0 ±	± 5.6	
Surgery duration (min)			
Median (Q1, Q3)	70 (50, 86)	56.5 (50.2, 66.2)	.158[c]
Mean ± SD	70.7 ± 25.6	61.1 ± 16.7	
Phenylephrine (µg)			
Median (Q1, Q3)	1800 (1445, 2295)	1840 (1278, 2766)	.843[c]
Mean ± SD	2336 ± 2004	2112 ± 1269	
Ephedrine use, n (%)	4 (12)	5 (15)	.756[b]
Intraoperative pain[d], n (%)	11 (33)	7 (21)	
Mild (1–3)	3 (9)	4 (12)	
Moderate (4–7)	6 (18)	2 (6)	
Severe (8–10)	2 (6)	1 (3)	
Intraoperative pain treatment, n (%)	7 (21)	4 (12)	.297[b]
Fentanyl (IV)	5 (15)	1 (3)	
Epidural LA	4 (12)	3 (9)	
Nitrous oxide	0	1 (3)	
Combination therapy	2 (6)	1 (3)	
Side effects, n (%)			
Nausea	15 (45)	13 (38)	.549[e]
Vomiting	2 (6)	7 (20)	.081[b]
Pruritus	7 (21)	11 (32)	.341[e]

Tid till kir anestesi

Conversion of labour epidural analgesia to surgical anaesthesia for emergency intrapartum Caesarean section

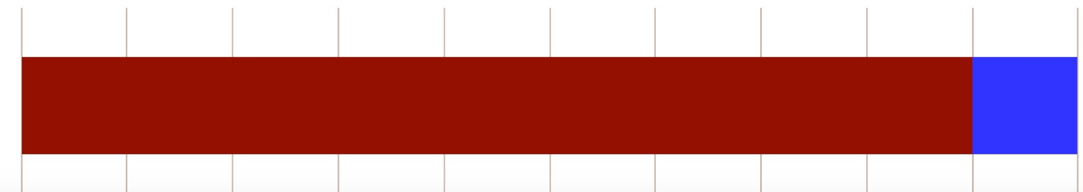
N. Desai[1,3,*] and B. Carvalho[2]

[1]Guy's and St Thomas' NHS Foundation Trust, London, UK, [2]Stanford University School of Medicine, Stanford, CA, USA and [3]King's College London, London, UK

*Corresponding author: Neel.Desai@gstt.nhs.uk

Tip #8: Implement "Fastest" Anesthesia Combo

Study	Agent	Time	Comment
Gaiser, IJOA 1998;7:27-31	Chloro 3% + Bicarb	3.1 min	Extension T4
	Lido 1.5% + Bicarb	4.4 min	Extension T4
Lam, Anaes 2001;56:790-4	Lido 2% + Epi+Bicarb	5.2 min	Extension T6
	Lido 2% + Epi	9.7 min	Extension T6



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Shia et al BMC Anesthesiology 2024 24:33

Table 4 Intraoperative outcomes of parturients underwent emergency cesarean section under general or neuraxial anesthesia

Variables	GA group	EA group	CSE group	*P* value
DDI, min	7[6,7][b]	6[6,7][b]	14[11.5,20.5]	$P<0.0001$
DDI ≤ 5, n(%)	65(19.3%)	26(19.0%)	0	
5 < DDI ≤ 10, n(%)	253(75.1%)	104(75.9%)	14(20.9%)	
10 < DDI ≤ 15, n(%)	14(4.1%)	3(2.2%)	23(34.3%)	
15 < DDI ≤ 20, n(%)	3(0.9%)	4((2.9%)	12(17.9%)	
20 < DDI ≤ 30, n(%)	2(0.6%)	0	15(22.4%)	
DDI > 30, n(%)	0	0	1(1.5%)	
DII, min	5[4,5][b]	5[4,5.5][b]	12[8, 17]	$P<0.0001$
OAII, min	1[1,2][a,b]	2[1,3][b]	5[3, 8]	$P<0.0001$
Blood loss, mL	400[380,565][b]	400[400,500][b]	390[350,500]	$P<0.0001$
Transfusion, n (%)	14(4.2%)[a]	0	0	0.01
Vasoactive drug, n (%)	12(3.6%)	5(3.6%)	6(9.2%)	0.108
Hospitalization, day	6[5,7][b]	6[6,7][b]	6[5,6.5]	0.001

Data were expressed as median [P25, P75] or number (percentage); *DDI* Decision to delivery interval, *DII* Decision to incision interval, *OAII* Onset of anesthesia to incision interval

[a] $p<0.05$ in comparison with EA group

[b] $p<0.05$ in comparison with CSE group

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Överens om:

- **Snabbast:** 6-13min till kir anestesi
  - Lidocain med bic el adr om extra behövs: ropivakain påfyllning efter 30 min
  - 2 chloroprocaine 3%
- **Mellan**: ca 15 min till kir anestesi
  - Ropivakain 0,75%- säkert, behöver ej fyllas på . + fentanyl minskar anslagstiden
- **Långsammast** anslag:
  - Bupivakain, dessutom risk för ion-trapping i fostret. Hjärtpåverkan.

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Hur gör vi i Skandinavien?

- 2016
- 25 olika Läkemedelskombinationer rapporterades

International Journal of Obstetric Anesthesia (2016) 25, 45–52
0959-289X/$ - see front matter © 2015 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.ijoa.2015.08.007

www.obstetanesthesia.com

ORIGINAL ARTICLE

The extension of epidural blockade for emergency caesarean section: a survey of Scandinavian practice

K. Wildgaard,[a] F. Hetmann,[b] M. Ismaiel[a,c]

Sweden

Drug combinations	Frequency
0.75% ropivacaine	17 (29.3%)
0.75% ropivacaine + sufentanil	12 (20.7%)
0.75% ropivacaine + fentanyl	9 (15.5%)
2% lidocaine + sufentanil + adrenaline	5 (8.6%)
2% lidocaine + adrenaline	4 (6.9%)
2% lidocaine + sufentanil	2 (3.4%)
0.75% ropivacaine + sufentanil + morphine	2 (3.4%)
1% ropivacaine + fentanyl	2 (3.4%)
0.5% bupivacaine	1 (1.7%)
2% lidocaine + fentanyl + adrenaline	1 (1.7%)
1% lidocaine + adrenaline	1 (1.7%)
2% mepivacaine + adrenaline	1 (1.7%)
2% mepivacaine + fentanyl + adrenaline	1 (1.7%)
Not reported	1 (1.7%)

Data are number (%).

2 chloroprocaine 3%

- Licenspreparat i Sverige
- Används mkt i USA

> Chloroprocaine is an ester class local anesthetic with labeled indications to provide anesthesia through infiltration, peripheral nerve, epidural, and caudal block. Due to its low potential for systemic toxicity, chloroprocaine has been used to identify inadvertent intravascular epidural catheter insertion in pregnant and non-pregnant adults.[1]
>
> The most common application for chloroprocaine is the obstetric setting, where it is used to provide fast onset epidural anesthesia when urgent or emergent cesarean delivery is indicated.[2][3] Large doses of chloroprocaine can be administered in this setting because of the low potential for maternal and fetal toxicity.[4]

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Erfarenheter från våra förlossningskliniker med 2 chloroprocain eller lidocain med bic

- Danderyds Sjh
- Östra Sjh, 2 chloroprocain, mkt snabbt anslag
- SÖS på G med Chloroprocaine
- Gävle Lidocain med bic + adr. 5-7min anslagstid från det att börjar spruta

FR GÄVLE

Dra upp:

Blandningsschema

1. Dra upp 17ml av lidocain 20mg/ml (i 20ml-spruta).
2. Dra upp 1 ml av adrenalin 0,1mg/ml i en 1 ml- spruta, och spruta ned i 20 ml-sprutan lidocain.
3. Dra upp 3 ml natriumbikarbonat 50mg/ml i en 3 ml-spruta ned i 20 ml-sprutan med lidocain och adrenalin.

20 ml sprutan innehåller nu 21 ml.

- Lidocain 17mg/ml.
- Adrenalin 5 micg/ml.
- Natriumbikarbonat 7,5 mg/ml.

Kopians giltighet garanteras endast utskriftsdatumet

3. Starta vätsketillförsel med varm 1000 ml Ringer Acetat.
4. Lidocain-blandningen doseras med 16-20 ml (såsom med Ropivacain), ge 3 ml initialt, avvakta 2 minuter och ge sedan resten av den mängden som är tänkt ge. Ges med uppdelade doser under 3 minuter. Den lägre dosen om patienten är kortväxt.
5. Mät blodtryck varje minut och behandla ev. blodtrycksfall enl. gängse rutiner vid spinalsnitt (efedrin, "flytta uterus", vätska).
6. Bedövningen anses OK när känsla för kyla är blockerad från T6 - S5 och känsla för smärta är blockerad från TH 8. Blockaden ska vara bilateral.
7. Om bedövningen anses otillräcklig kan katetern dras 1 cm och sen ges ytterligare 5 ml Lidocain 20 mg/ml. Detta förutsätter att kateter ligger minst 4 cm inne i epiduralrummet.
8. Slutgiltig kontroll av bedövningen innebär att operatören nyper med peang i operationsområdet. Detta ska inte vara smärtsamt.
9. Effektdurationen kan vara kort. Om mamman under operationen börjar känna att bedövningen börjar gå ur, fyller man på i EDA-katetern med 6-7 ml Ropivacain 7,5 mg/ml.

4.1. Avslut

garanteras endast utskriftsdatumet

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Östra sjh (10 000 förlossningar)

- Placentalösning
  - Sufenta 20ug
  - Ampress (2 chloroprocain 3%) 30mg/ml 10 ml

- Sectio
  - Sufenta 20ug
  - Ampress 30mg/ml 18-20 ml

Vi har/vill ha 2 chloroprocaine 3% alt lidocaine 20mg/ml + bic på mitt sjukhus för snabb EDA påfyllning?

- 1)Ja
- 2)Jag blev inspirerad- tar det med mig och vill/ser till att vi kan börja
- 3)Nej

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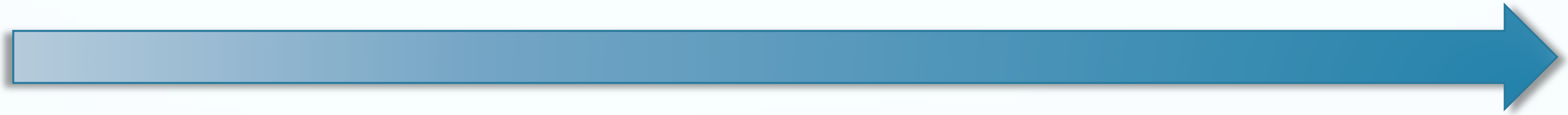
Tiden tickar....



- Beslut

incision

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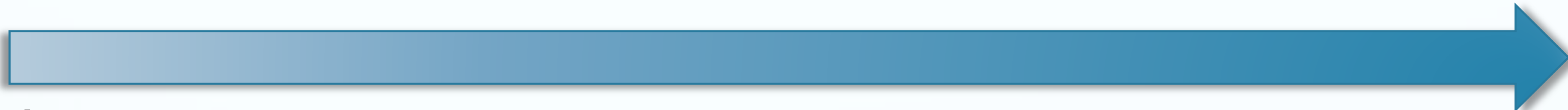
Tiden tickar....



GA:	pat på op avd	pat på sal	incicion?	
EDA:	pat på op avd-fyller på eda, pat på sal			incicion ?
SPA:	pat på op avd	pat på sal	SPA	incicion ?

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Sammanfattning

- Undvik Generell Anestesi: ”sällan” nödvändigt och farligt
- Rapid Sequense Spinal — DDI 23 min DII ?
- EDA:
  - Om bråttom:
    - lidocaine med bic+adrenalin eller
    - chloroprocaine 3% — 6-13 min till incision DII
  - Annars: ropivacain 0,75% + fentanyl. — Ca 17 min till incision DII

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