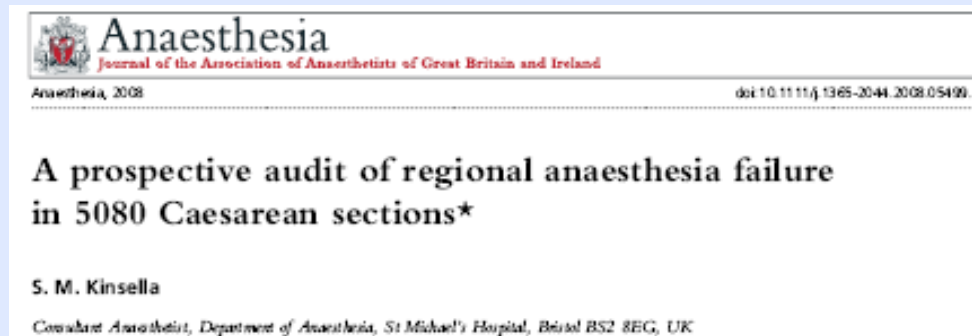


How to reduce failure rate of regional anaesthesia for caesarean section ?



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Define failure

- GA conversion; RCoA standards Cat 4 <1%
Cat 1-3 <3%
- Other anaesthesia
- Pain
- “Inadequate block after adequate time”

- Pre-op
 - change to other anaes or fail achieve adequate block
- Intra-op
 - Pain needing treatment

RCoA Raising the standard. 2004
Riley & Papasin J. Int J Obstet Anesth 2002;11:81
Orbach-Zinger et al. Acta Anaesthesiol Scand 2006;50:1014
Halpern et al. Br J Anaesth 2009;102:240
Kinsella. Anaesthesia 2008;63:822

Failure - the woman's view

- 100 antepartum

Outcome	Rank	Relative value
Pain during cesarean	8.4 ± 2.2	27 ± 18
Pain after cesarean	8.3 ± 1.8	18 ± 10
Vomiting	7.8 ± 1.5	12 ± 7
Nausea	6.8 ± 1.7	11 ± 7
Cramping	6.0 ± 1.9	10 ± 8
Itching	5.6 ± 2.1	9 ± 8
Shivering	4.6 ± 1.7	6 ± 6
Anxiety	4.1 ± 1.9	5 ± 4
Somnolence	2.9 ± 1.4	3 ± 3
Normal	1	0

Failure - the woman's view

- 60 post CS - VAS

1. Discomfort requiring analgesia during operation / post-delivery	12 (2, 34)
2=. Further spinal or epidural pre-operatively	16 (3, 41)
2=. Discomfort requiring analgesia during operation / pre-delivery	16 (2, 55)
4. General anaesthesia (GA) pre-operatively	54 (30, 76)
5. Pain during operation / post-delivery	60 (28, 85)
6. GA because of pain during operation / pre-delivery	66 (20, 83)
7. GA because of pain during operation / post-delivery	71 (38, 90)
8. Pain during operation / pre-delivery	72 (44, 90)

Failure - the woman's view

I would not want a general anaesthetic during my operation

I would rather have a general anaesthetic than feel pain during my operation

Do not want GA	<i>versus</i>	GA preferable to per-operative sensation	-42 (-48, -22)
Do not want GA	<i>versus</i>	GA preferable to per-operative discomfort	-4 (-35, 19)
Do not want GA	<i>versus</i>	GA preferable to per-operative pain	20 (-14, 46)
Wish to be awake for birth	<i>versus</i>	GA preferable to per-operative pain	-18 (-43, 25)

Urgency

<u>Category</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>
Pre-op OR	1	1.29	1.27	2.45
GA conversion	0.7%	1.8%	4.6%	9%
Primary GA	2%	2.1%	2.5%	35%
All GA	3%	3.9%	7.1%	44%

Type of anaesthesia

	<u>Pre-op</u>	<u>Intra-op</u>	<u>Fail satisfactory result</u>
Spinal	1	1	6%
Epidural top-up	3.2	5.7	24%
CSE	1.6	3.0	18%

GA conversion at elective CS:

- Spinal 0.5% - 2.1%
- NTN CSE 0.8%
- 2Sp CSE 0.23%
- SMH CSE 2.6% [complex]

	<u>Spinal</u>	<u>CSE</u>	<u>Epidural top-up</u>
Cat 4	90%	10%	
Cat 1-3	53%	3%	43%

Intraoperative

- Block inadequate (T4-S5 cold; T12 anaesth)

RA / spinal / epidural

	<u>Pain</u>	<u>GA</u>
Spinal	25%	2.5%
Epidural	45%	14%

- Duration

RA / spinal / epidural

	<u>0-60</u>	<u>61-90</u>	<u>>90</u>
Spinal	1	2.4	9.1
Epidural	1	1.4	6.0

Top up volume:

ml	<u>0-14</u>	<u>15-19</u>	<u>20-24</u>	<u>>24</u>
OR	0.75	0.4	1.0	3.19

Predictors of failure to top up epidural for CS:

- Number of top-ups [>2]
- Epidural catheter repositioned (pulled back)
- Prolonged duration of labour epidural
- Anaesthetist who is not a specialist obstetric anaesthetist
- Weight
- Height

Riley & Papasin. Int J Obstet Anesth 2002;11:81
Orbach-Zinger et al. Acta Anaesthesiol Scand 2006;50:793
Habib et al. Anesthesiol 2002;96:P75
Lee et al. Anesth Analg 2009;108:252
Halpern et al. Br J Anaesth 2009;102:240

Improve epidurals during labour....

- 10 ml dilute local anaesthetic top up
- VAS pain scores every 10 minutes after epidural insertion
- Replace epidural catheter if pain score not improving after 3 doses

Table: Median pain scores before epidural insertion and until the mother was comfortable

	Baseline	10 min	20 min	30 min	40 min
1 bolus n = 14	8.5	2.5			
2 boluses n = 49	8	6	2		
3 boluses n = 28	9	7	5	1	
4 boluses n = 4	9.5	9	8	5	2
Resited n = 6	8	7	7		

b.p.m 80
60
40

Pain Score (0 - 10)

Block level - upper (R/L)

Block level - lower (R/L)

Motorblock (R/L)

Resp. rate

Inf rate ml/hr

Under review by the RCOG
OBSTETRIC ANALGESIA/ANESTHESIA
Chart

Initial Assessment of Epidural

Assessment of epidural analgesia / analgesia

ANALGESIA FOR LABOUR

Time

B.P. mm Hg

SpO2

Pain Score (0-10)

Block level - upper (R/L)

Block level - lower (R/L)

Motorblock (R/L)

Resp. rate

Inf rate ml/hr

Given by / Checked by

Catheter Removal

Location that the epidural catheter was placed or removed

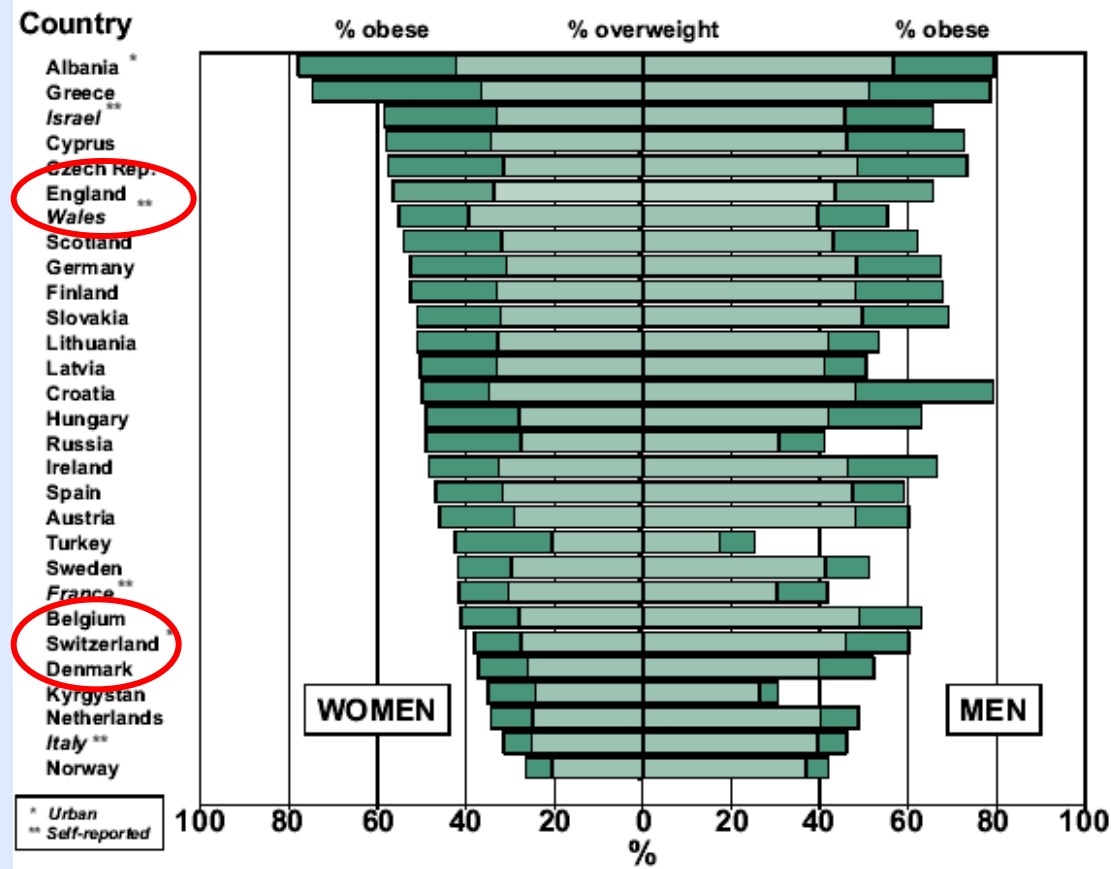
Notes

Date

Time

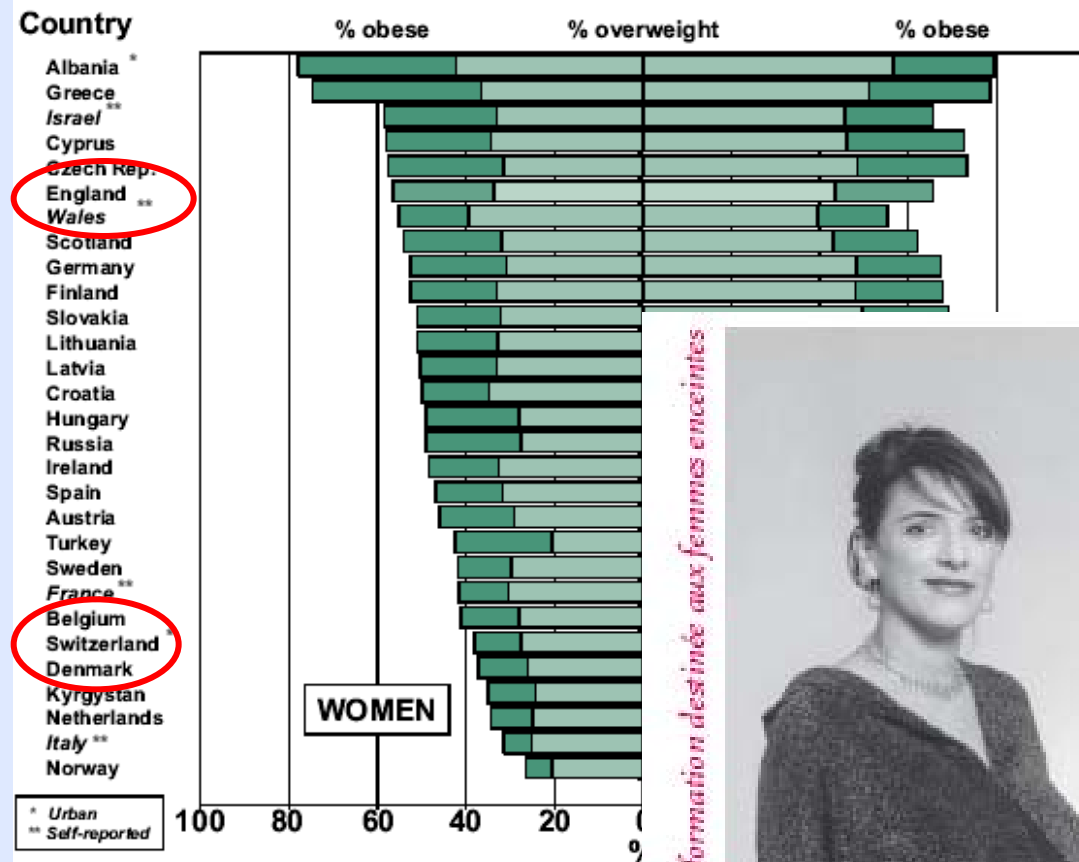
- Ward rounds

Figure 1: Obesity levels in Europe



Source: International Obesity Task Force

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Source: International Obesity Task Force

Information destinée aux femmes enceintes



Information pour femmes enceintes à l'indice de masse corporelle élevé

Obesity

kg	<u><60</u>	<u>60-66</u>	<u>67-77</u>	<u>>77</u>
	0.7	1	1.4	0.9

- BMI >40
 - resite 6.6% versus 2.4%
- >300 lb (136 kg)
 - initial failure 42% Vs 6%
 - success for CS top-up

Drugs used

		Pre-op	Intra-op
<u>Epidural</u>	Adrenaline	No 1	1
		Yes 0.54	0.58
<u>Spinal</u>	Opioid	No 5.5	
		Yes 1	

Akerman et al. Br J Anaesth 2005;94:843
 Saravanan et al. Br J Anaesth 2003;91:368
 Uehlin et al.

Figure 9. Local anesthetic used for epidural anesthesia for CS

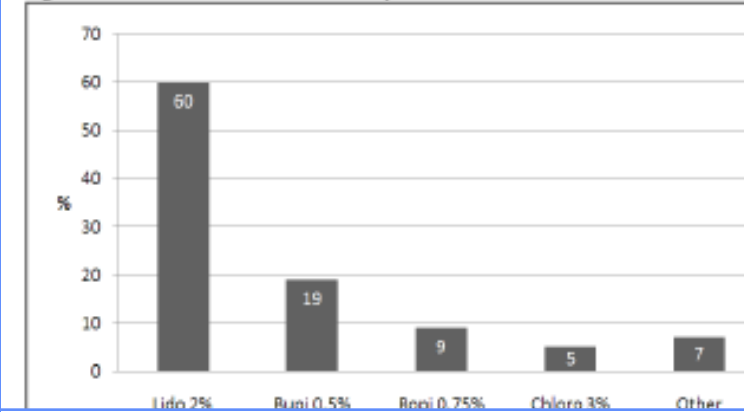
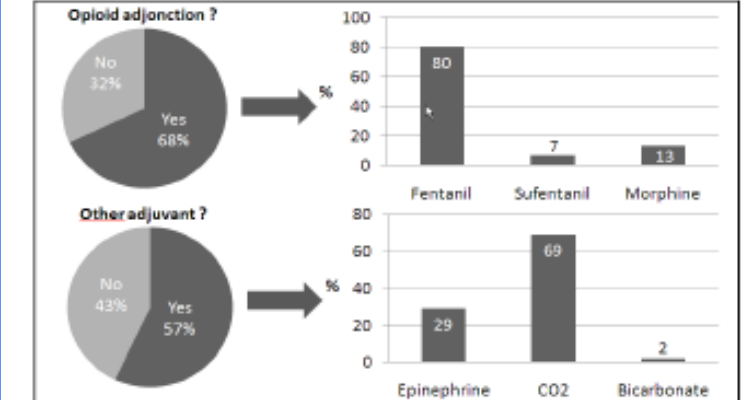


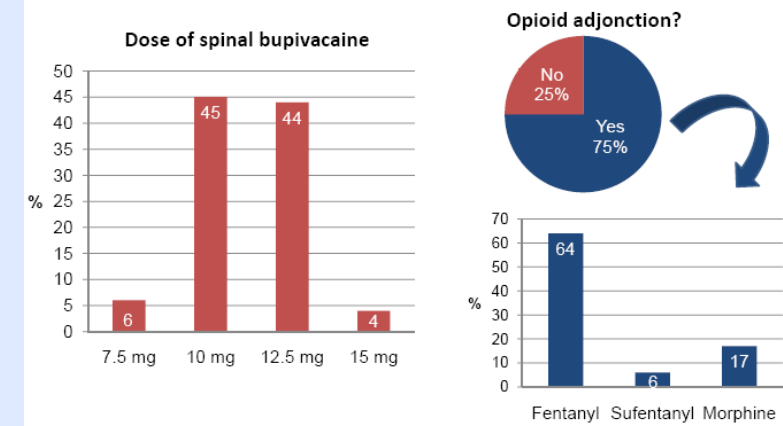
Figure 10. Adjuvants used for epidural anesthesia for CS



3. Anaesthesia for caesarean section : spinal anaesthesia

Spinal solution content

17



Lessons

- Choice of anaesthesia for category 1 CS
- Use spinal rather than epidural
- 'Practice' CSE
- Test the block – have a plan
 - redo regional block
 - proceed with caution

Lessons

- Spinal
 - use opioid
- Epidural
 - during labour - resite poor epidural
(= slow onset, multiple top-ups, pulled back)
 - adrenaline
 - top up catheter after 45-60 min

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Obesity

Epidural

kg	<60	60-66	67-77	>77
	0.7	1	1.4	0.9

RA

BMI	<25	25-30	30-35	35-40	>40
	0.8	1	0.7	0.95	1.8

- BMI >40
 - resite 6.6% versus 2.4%
- >300 lb (136 kg)
 - initial failure 42% Vs 6%
 - success for CS top-up