Scandinavian SSAI clinical practice guideline on the use of single shot remifentanil for rapid sequence induction of general anaesthesia for emergency caesarean section in healthy parturients

Mette Legaard Andersson, Peter Bengtsson, Camilla Edvinsson, Gjertrud Hustad, Jarno Jokelainen

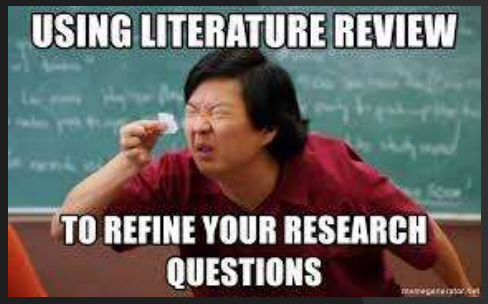
Clinical question

- ‘Should single shot remifentanil be used for rapid sequence induction of general anaesthesia in healthy parturients for emergency caesarean section?’
- Because traditionally we refrain from using opioids at induction of GA for CS due to fear of respiratory depression in the neonate.

PICO

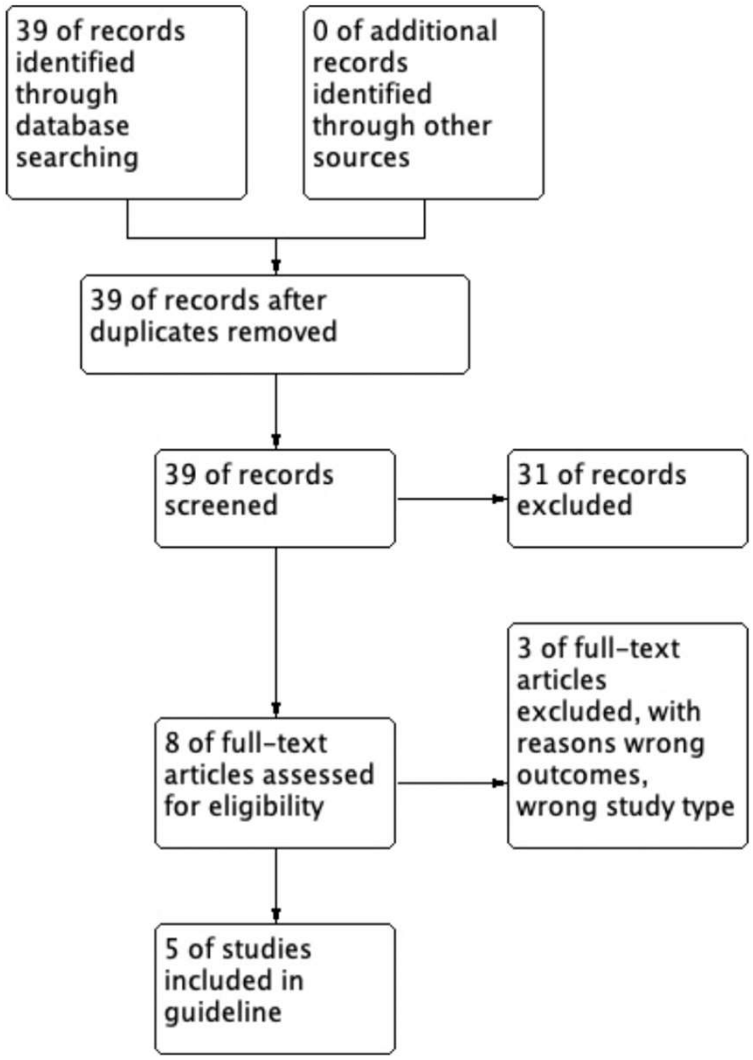
- P: Healthy parturients undergoing emergency CS in GA
- I: Any dose of single shot remifentanil for RSI but excluded studies with infusion of remifentanil
- C: Placebo, i.e. no opioids for induction of GA
- O: Neonatal ventilatory support and APGAR. Maternal highest BP at time of or immediately after intubation, and maternal awareness

Literature search

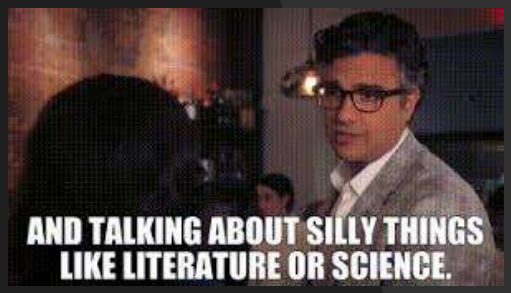


- We included systematic reviews of randomized clinical trials and randomized controlled trials (RCTs). A preliminary literature search found no studies on emergency CS alone, hence all categories of CS were included.
- We systematically searched PubMed (January 1966 to 25 February 2020), for systematic reviews of RCTs and RCTs comparing single shot remifentanil with placebo on 25 February 2020. No language restriction was employed.

Prisma flow diagram



Literature



- Five studies in all were found, whereof two systematic reviews, resulting in data from four RCTs:

- Behdad et al. 2013
- Heesen et al. 2013
- Ngan Kee et al. 2006
- Noskova et al. 2015
- White et al. 2019

Evidence profile

Single shot remifentanil compared to no opioids for rapid sequence induction in healthy parturients undergoing caesarean section in general anaesthesia

Patient or population: **rapid sequence induction in healthy parturients undergoing caesarean section in general anaesthesia**
Intervention: **Single shot remifentanil**
Comparison: **no opioids**

Outcomes	№ of participants (studies and design)	Study limitations (risk of bias)	Inconsis-tency	Indirect-ness	Impre-cision	Publica-tion bias	Overall quality	Event rate or mean score/value*		Relative risk or mean difference (95% CI)	Importance
								With no opioids	With Single shot remifentanil		
Neonatal ventilatory support	311 (4 RCTs)	No serious limitations	No serious limitations	No serious limitations	Very serious limitations	No serious limitations	⨁⨁◯◯ LOW	8 per 100	9 per 100 (4 to 19)	1.1592 (0.5540 to 2.4255)	Critical
Neonatal 1 min Apgar score 0-7	311 (4 RCTs)	No serious limitations	No serious limitations	No serious limitations	Serious limitations	No serious limitations	⨁⨁⨁◯ MODERATE	10 per 100	19 per 100 (11 to 33)	1.8009 (1.02 to 3.1796)	Important, but not critical
Neonatal 5 min Apgar score 0-7	311 (4 RCTs)	No serious limitations	No serious limitations	No serious limitations	Serious limitations	No serious limitations	⨁⨁⨁◯ MODERATE	1 per 100	1 per 100 (1 to 19)	1.0192 (0.6188 to 14.7305)	Critical
Maternal highest SBP at/after intubation	311 (4 RCTs)	No serious limitations	No serious limitations	No serious limitations	Very serious limitations	No serious limitations	⨁⨁◯◯ LOW	Mean 155.65 mmHg	Mean 136.38 mmHg (115.96 to 156.8)	19.27 mmHg (-1.15 to 39.69)	Important, but not critical
Maternal awareness (assessed as BIS > 60% at intubation)	151 (1 RCT)	No serious limitations	No serious limitations	No serious limitations	Very serious limitations	No serious limitations	⨁⨁◯◯ LOW	0 per 100	0 per 100 (0 to 0)	0.9870 (0.0198 to 49.1116)	Important, but not critical

***The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI).**
CI: **Confidence interval**

GRADE assessment of the five factors that can reduce the quality of evidence (study limitations, inconsistency, indirectness, imprecision and publication bias):
No serious limitations: **Most evidence is from studies with low risk of the factor**
Serious limitations: **Most evidence is from studies with moderate risk of the factor**

Results and recommendations

- **Neonatal effects of single shot remifentanil for RSI of GA in emergency CS**

- We found no statistically significant differences in neonatal critical outcomes; that is neonatal ventilatory support and neonatal 5 min APGAR score $\leq$ 7.

- We suggest that single shot remifentanil can be used for RSI of GA in emergency CS without compromising the safety of the neonate

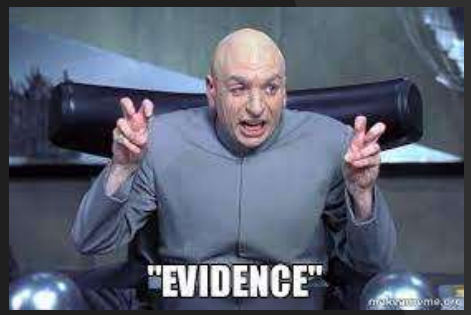
Results and recommendations

- **Maternal effect of single shot remifentanil for RSI of GA in emergency CS**

- We found a statistically significant lower maternal systolic blood pressure at/after intubation in the remifentanil group compared to no opioids.

- We suggest that single shot remifentanil should be used for RSI of GA in emergency CS to reduce the maternal hypertensive response during intubation

Quality of evidence



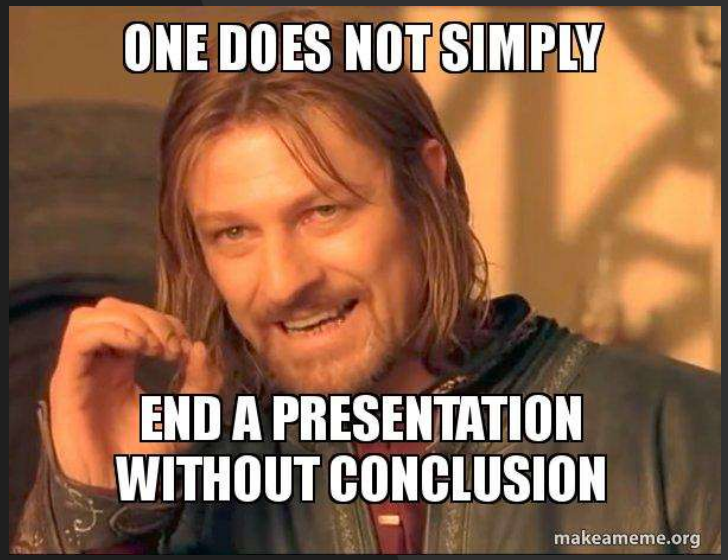
Neonatal outcomes:

- Regarding APGAR 5 min we regard the quality of evidence to be moderate (critical outcome)
- Regarding ventilatory support of the neonate, we regard the quality of evidence to be low (critical outcome)
- Regarding APGAR 1 min we regard the quality of evidence to be moderate (important outcome)

Maternal outcomes:

- Regarding the hemodynamical stability of the mother, we regard the quality of evidence to be low (important outcome)
- Regarding maternal awareness, we regard the quality of evidence to be low (important outcome)

- Limitations in the guideline work are foremost the lack of sufficiently powered studies, which leads to a low to moderate evidence level and a weak recommendation.
- Also, a lack of studies regarding the use of remifentanil in emergency CS, has forced us to extrapolate data from elective CSs.



- We found no statistically significant difference in neonatal outcomes but a statistically lower maternal systolic blood pressure at/after intubation in the remifentanil group compared to no opioids.

- As of today, there is little or no documentation looking at how healthy and vulnerable parturients may differ in their need and tolerance for opioids used during CS. There is also lack of trials to part emergency CSs from the elective ones.

- The certainty of the evidence is low to moderate and further research is needed to make a strong recommendation.