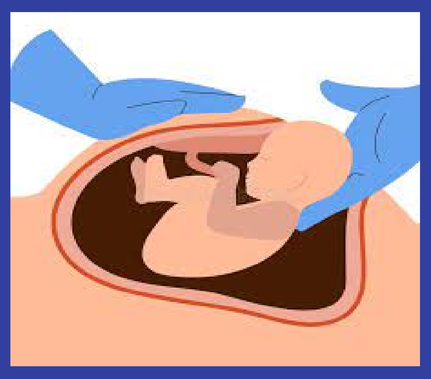
Differences in Pain-Related Patient-Reported Outcomes Between Women Receiving Spinal - versus General Anesthesia for Cesarean Delivery Are Minor: Analysis of Registry findings



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BACKGROUND & AIM

Spinal anesthesia is the gold standard for pain management after Cesarean Section (CS). It provides excellent and prolonged post-operative analgesia [1].

Common indications for General Anesthesia (GA) are urgency of CS, contraindications or maternal refusal of neuraxial anesthesia [2] and in some countries, lack of equipment to carry out neuraxial anesthesia.

The aim of this analysis was to evaluate pain-related patient-reported outcomes (PROs) after CS in women who received spinal anesthesia (SA) compared to GA.

We hypothesized that PROs in women receiving SA would be better compared to those with GA.

METHODS

PAIN OUT, an international, perioperative pain registry, offers clinicians standardized methodology for assessing perioperative management of pain and multi-dimensional Patient Reported Outcomes (PROs) **on the first day after surgery**. All participating hospitals obtained ethical approval.

Women after CS filled in the International Pain Outcomes questionnaire. These ratings served as the basis for creating a multi-dimensional '**Pain Composite Score' (PCS)**. The PCS_{total} is the mean of 12 continuous PROs evaluating pain intensity, its interference with function and emotions and side-effects. **Three sub-scores** were created addressing **pain intensity, pain-related interference and side effects** .

Primary endpoints were adjusted mean differences in the PCS_{total} between women treated with SA *vs.* GA. **Secondary endpoints** were the adjusted mean differences in the PCS sub-scores. A **tertiary analysis** included the association between the PCS and spinal morphine and intraoperative I.V. dexamethasone.

The association between the PCS and anesthesia technique was analyzed with multi-level linear regression models. The PCS served as the dependent variable and all models were controlled for age, pre-existing chronic pain, opioid administration on the obstetric ward and income level of the country of origin (high vs. low/middle income). In the **basic models**, the main independent variable was type of anesthesia (results not shown here). In the **complex models**, spinal morphine and intraoperative i.v. dexamethasone were also included as independent variables.

The regression coefficients can be interpreted in standard deviations (≥0.1 small, ≥0.3 medium, ≥0.5 large effect size). Positive and negative regression coefficients indicate worse vs better outcomes, respectively. $P<0.05$ values were considered as significant.

RESULTS

4,518 women underwent CS and provided assessments of multi-dimensional pain-related outcomes, a median of 23:00 hours after surgery.

Women were cared for in 23 obstetric wards, in 13 high- & 11 low-middle income countries.

86% (n = 3 879) of women underwent surgery with SPINAL anesthesia and 14% (n = 639) with GENERAL anesthesia.

A high proportion of women in both anesthesia groups reported severe pain, pain-related interference with movement, coughing and taking a deep breath and would have liked more pain treatment than they had received (**Figure 1).**

In the complex regression models **(Table 1, A-D)**, only the PCS_{total} was significantly different between SA vs GA. This was a small effect size. Differences for the sub-scales were NOT significant. There was no association with country of origin.

Spinal morphine was administered to 22% of women. This was associated with BETTER outcomes for PCS_{total} ,the intensity and interference subscales. Effect sizes were small to medium. Administration of spinal morphine was associated with increased in side effects (medium effect size).

Intraoperative i.v. dexamethasone was associated with improved outcomes for all PCS. These were small to medium-sized effects**.**

CONCLUSIONS

Findings from a large sample of women indicate that pain-related PROs on the first day after CS were only marginally better in women receiving SA compared to GA.

The effect was probably moderated by the spinal morphine, administered to only a fifth of women. None of the sub-scores, pain intensity, pain-related interference and side-effects were better in SA vs GA treated women.

Limitations related to this analysis include lack of information about urgency of CS, about the surgical technique and the status of the new-born.

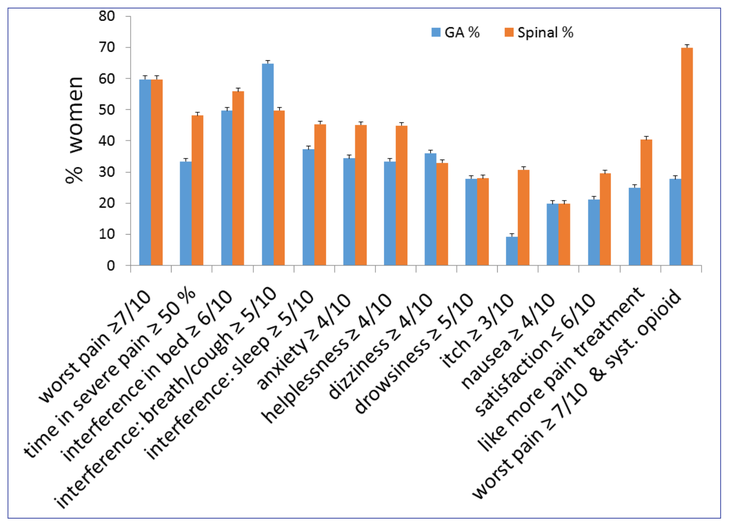

Figure 1 Dichotomized patient-reported out-comes of women receiving SA vs GA. Medians with 95% CI.

Table 1 Results for the COMPLEX model regression

A Complex Model | Pain Composite Score: TOTAL						
Variable	**Reference**	**β_z**	**95%CI**		**P**	**Effect size**
(intercept)		0.10	-0.33	0.13	0.367	
Spinal	(*vs.* GA)	-0.13	-0.26	-0.00	**0. 049**	small
Age	(standardized)	-0.02	-0.05	0.01	0.169	N/S
Pre-existing chronic pain	(*vs.* no)	0.22	0.12	0.33	**0.000**	small
High income country	(*vs.* no)	0.20	-0.07	0.48	0.159	N/S
Spinal morphine	(*vs.* no)	-0.18	-0.32	-0.04	**0.010**	small
Intra-op dexamethasone	(*vs.* no)	-0.34	-047	-0.21	**0.000**	small-medium
Systemic opioid (ward)	(*vs.* no)	0.13	0.04	0.21	**0.003**	small

B Sub-Score: PAIN INTENSITY						
Variable	**Reference**	**β_z**	**95%CI**		**p**	**Effect size**
(intercept)		-0.07	-0.29	0.06	0.570	
Spinal	(vs. GA)	-0,06	-0,18	0,06	0,331	N/S
Age	(standardized)	0,02	-0,01	0,05	0,195	N/S
Pre-existing chronic pain	(vs. no)	0,14	0,04	0,25	**0,005**	small
High income country	(vs. no)	-0,18	-0,46	0,10	0,221	N/S
Spinal morphine	(vs. no)	-0,39	-0,52	-0,26	**0,000**	small-medium
Intra-op dexamethasone	(vs. no)	-0,13	-0,25	-0,01	**0,040**	small-medium
Systemic opioid (ward)	(vs. no)	0,15	0,08	0,23	**0,000**	small

C Sub-Score: PAIN INTEFERENCE						
Variable	**Reference**	**β_z**	**95%CI**		**p**	**Effect size**
(intercept)		-0,01	-0,24	0,23	0,953	
Spinal	[vs. GA]	-0,11	-0,24	0,02	0,100	N/S
Age	[standardized]	-0,02	-0,05	0,02	0,333	N/S
Pre-existing chronic pain	[vs. no]	0,14	0,03	0,25	**0,012**	small
High income country	[vs. no]	0,30	0,01	0,59	0,056	small
Spinal morphine	[vs. no]	-0,41	-0,55	-0,27	**0,000**	small-medium
Intra-op dexamethasone	[vs. no]	-0,31	-0,44	-0,19	**0,000**	small-medium
Systemic opioid (ward)	[vs. no]	0,10	0,02	0,19	**0,015**	small

D Sub-Score: SIDE EFFECTS						
Variable	**Reference**	**β_z**	**95%CI**		**p**	**Effect size**
(intercept)		-0,18	-0,35	-0,02	**0,040**	
Spinal	[vs. GA]	-0,12	-0,25	0,01	0,066	N/S
Age	[standardized]	-0,05	-0,08	-0,01	**0,004**	trivial
Pre-existing chronic pain	[vs. no]	0,26	0,15	0,37	**0,000**	small to medium
High income country	[vs. no]	0,20	0,01	0,39	**0,051**	small
Spinal morphine	[vs. no]	0,42	0,28	0,55	**0,000**	small to medium
Intra-op dexamethasone	[vs. no]	-0,30	-0,42	-0,17	**0,000**	small to medium
Systemic opioid (ward)	[vs. no]	0,06	-0,02	0,14	0,157	N/S

PAIN OUT

REFERENCES

1. Sutton CD, Carvalho B Optimal Pain Management After Cesarean Delivery. *Anesthesiology Clinics* 2017; **35:** 107-24.
2. McGlennan A, Mustafa A General anesthesia for Caesarean section. *Continuing Education in Anesthesia Critical Care & Pain* 2009; **9:** 148-51.

The authors declare that they have no conflict of interest related to this study .

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