A randomized controlled trial evaluating intravenous dexamethasone's effect on spinal anesthesia duration after cesarean delivery

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Introduction

The proportion of births in Canada via cesarean delivery (CD) has increased leading to adoption of Enhanced Recovery After Cesarean (ERAC) protocols. ERAC is a perioperative care framework spanning the preoperative, intraoperative and postoperative phases to accelerate recovery and reduce complications from CD.[1]

Dexamethasone (DEX), a corticosteroid, is used in ERAC for antiemetic and anti-inflammatory effects, but it may prolong the motor and sensory recovery after spinal anesthesia.[2,3]

The **primary objective** is to evaluate the effect of 10mg intravenous (IV) dexamethasone vs 10mg IV metoclopramide (MET) on the duration of motor block in patients undergoing elective CD under spinal anesthesia.

Secondary outcomes include the effect of 10mg IV Dexamethasone on: (1) Sensory recovery, (2) total 24-hour hydromorphone requirement postoperatively, (3) the incidence of pruritus, and (4) the incidence of nausea and vomiting (PONV).

Methods

Study design: Double blind randomized controlled trial: **129 patients** were randomly allocated to receive 10mg IV DEX or 10mg IV MET.

Data collection: Blinded motor and sensory outcomes were assessed using a modified Bromage score and ice respectively. Motor recovery was defined as a Bromage score of 4 and sensory recovery as an L3 dermatome level bilaterally.

Results

IV Dexamethasone prolonged the spinal anesthesia motor block duration by ~ 20 min [189 (54) min vs 167.5 (45.8) min, W = 2504; P = 0.022] and sensory block duration by ~ 11min [229 (44.5) min vs 217.5 (60.8) min, W = 2397; P = 0.047] compared to IV metoclopramide, without detectable differences in early post-operative symptoms or opioid use (Table 2).

Discussion

10mg IV dexamethasone modestly increased motor and sensory block duration. These data support the selective incorporation of dexamethasone into ERAC pathways, as part of the multimodal PONV prophylaxis regimen and for CDs in which a longer duration of spinal anesthesia is desired.

References

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3. Abebe M, Alemu B, Teku G, et al. Effectiveness of Single Intravenous Dexamethasone in Prolongation of Spinal Anesthesia for Postoperative Analgesia in Elective Cesarean Section: A Systematic Review of Randomized Controlled Trials. J Pain Res. 2024;17:1361-1368.

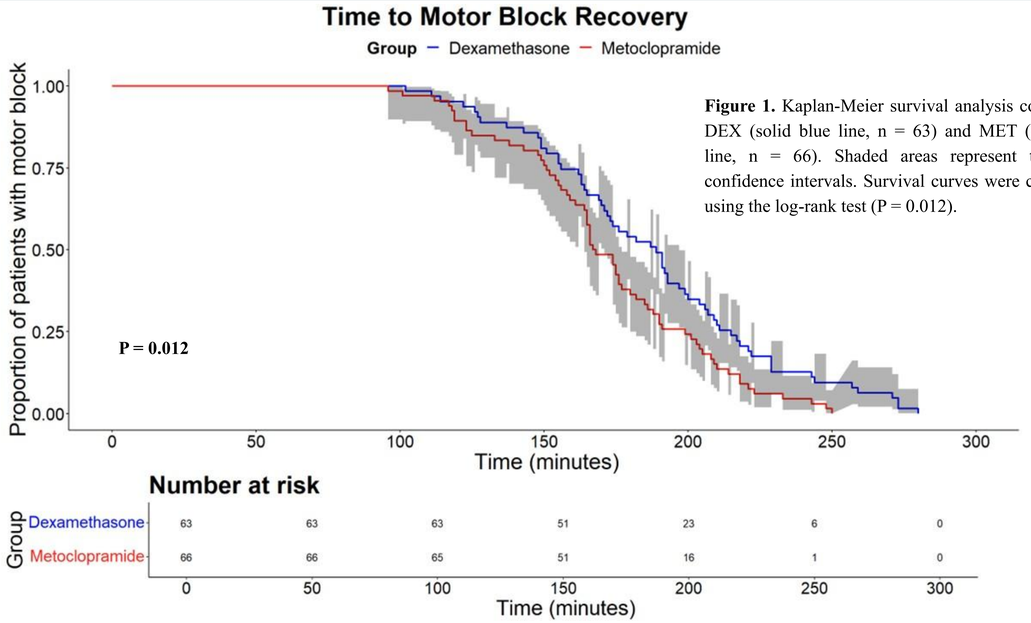


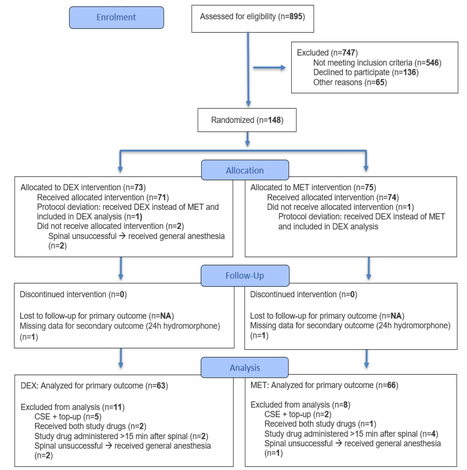
Figure 1. Kaplan-Meier survival analysis comparing DEX (solid blue line, n = 63) and MET (solid red line, n = 66). Shaded areas represent the 95% confidence intervals. Survival curves were compared using the log-rank test (P = 0.012).

Table 1. Multivariable linear regression of motor block duration after spinal anesthesia

Model	Unstandardized coefficients		t-value	P-value	95% confidence interval	
	B	Std. error			Lower Bounds	Upper bounds
Constant	440.128	93.003	4.723	**<0.001**	256.049	624.208
Group2 {MET}	-14.4	6.7861	-2.122	**0.03582**	-27.832	-0.969
Age (years)	0.3972	0.7914	0.502	0.61661	-1.169	1.964
Height (cm)	-1.5117	0.5335	-2.833	**0.00538**	-2.568	-0.456
BMI	-0.5991	0.7018	-0.854	0.39488	-1.988	0.79

Std. error = Standard error; B = beta(slope). Significance level set at $P < 0.05$.

Figure 2. CONSORT flow Diagram



DEX = Dexamethasone; MET = Metoclopramide; CSE + top-up = Combined spinal-epidural with 2% lidocaine

Eligibility: Non-emergent CD with spinal anesthesia; ≥ 18 years old; term gestation (≥ 37 weeks) with a singleton pregnancy; and American Society of Anesthesiologist physical status < III (excluding body mass index BMI).
Exclusion: BMI ≥ 45 kg/m^2; height < 152.4 cm; significant obstetric/neonatal comorbidities; opioid tolerance; study medication intolerance or contraindication; abnormal spine anatomy; chronic systemic corticosteroid use; and inability to cooperation with study procedures.

Table 2. Postoperative incidence of nausea, vomiting, pruritus, and pain

Outcome	DEX (n =63)			MET (n = 66)			Unpaired t-test			
	n	M	SD	n	M	SD	t -value	df	P - value	CI
24h Hydromorphone (mg) use	62	0.532	1.224	65	0.769	1.549	-0.95355	125	0.3422	[-0.729 – 0.255]
Worst pain score (0 – 10)	62	2.371	2.258	64	2.508	1.995	-0.36081	124	0.7189	[-0.888 – 0.614]
Worst nausea score (0 – 10)	62	1.169	1.948	64	1.234	2.153	-0.17759	124	0.8593	[-0.7897 – 0.6596]
	n	**Incidence (%)**		**n**	**Incidence (%)**		**RR**	**P-value**		**CI**
Incidence of Vomiting	63	7.94		66	3.03		2.619	0.2391		[0.527 – 13.013]
Incidence of Pruritus	63	34.92		66	30.30		1.1524	0.5763		[0.7007 – 1.895]
Incidence of Treatment for Nausea	63	6.35		66	9.09		0.6984	0.5633		[0.207 – 2.359]

CI = 95% confidence interval; SD = Standard Deviation; M = mean; n = Sample size; RR = Relative Risk; DF = Degrees of Freedom. N= Missing data. Significance level set at $P < 0.05$.