

TITLE: EFFECT OF MAGNESIUM SULFATE ON HEMODYNAMICS AND REFLEX SYMPATHETIC VASOCONSTRICTION
AUTHORS: J-C. Liao, Ph.D., T. Iijima, Ph.D., R.J. Palahniuk, M.D.
AFFILIATION: Anes. Dept., University of Minnesota, Minneapolis, MN 55455

Magnesium sulfate (M) infusion is a common obstetric practice during treatment of toxemia during pregnancy. The effect of M on reflex sympathetic vasoconstriction (RSV), a vitally important compensatory reflex during hemorrhage, has not yet been thoroughly studied. Thus, this study was done.

Thirteen dogs were monitored for blood pressure (BP), cardiac output (CO) and heart rate (HR). One isolated hind limb with intact sympathetic (S) innervation was autoperfused. Blood flow was kept constant, hence perfusion pressure (PP) in the limb varied proportionally to arterial resistance. RSV was elicited by the hypotension induced by 40 µg i.v. bolus of acetylcholine (Ach). Femoral arterial vasoconstriction (V) was obtained by intra-arterial injection of 1 µg norepinephrine (NE). The NE-induced V (NEV) and RSV response were expressed as +Δpp.

Control data of hemodynamics (BP, PP, CO, HR) and +ΔPP of RSV and NEV were obtained. Doses of M were: 2 g i.v. + 1 g/hr i.v. infusion (M1), 3 g i.v. +

1.5 g/hr i.v. (M2), 4 g i.v. + 2 g/hr i.v. (M3). Data were obtained after M1, M2 and M3 infusion (Table). RSV was blocked by spinal anesthesia. S vasoconstriction noted here must therefore be S reflex in origin. After M1, BP, HR and +ΔPP of RSV and NEV showed significant decline, but CO, PP were not significantly different. After M2, and M3 all data changed significantly from control (Table). M depresses the hemodynamics, RSV and NEV by direct vascular and also probably by S depression. A previous study showed that M decreased liberation of Ach at S ganglion.¹

References

1. J Pharmacol and Exp Ther 93:52-62, 1948.

	Control	After M1	After M2	After M3
BP (torr)	143 ± 7	120 ± 5*	102 ± 5*	83 ± 7*
CO (l/min)	5.43 ± 0.4	5.0 ± 0.3	4.4 ± 0.3*	3.5 ± 0.2*
HR (beats/min)	158 ± 6	142 ± 6*	128 ± 8*	109 ± 7*
PP (torr)	122 ± 7	115 ± 5	99 ± 4*	86 ± 4*
+Δ PP of RSV (torr)	51 ± 8	30 ± 5*	18.5 ± 3*	8.8 ± 3*
+Δ PP of NEV (torr)	47 ± 5	31 ± 3*	27 ± 4*	20 ± 4*

Dose of M1, M2, M3 (see text); data express as: mean ± SEM
(n=13) student paired T test employed

*significantly decreased from control (p < 0.05)

#significantly decreased from previous data (p < 0.05)

TITLE: POSTCESAREAN OXYGEN SATURATION VIA A TELEMETRIC PULSE OXIMETRY NETWORK
AUTHORS: P.H. Pan, MD, and C.F. James, MD
AFFILIATION: Dept. of Anesth., Univ. of Fla. College of Med., Gainesville, FL 32610-0254

We compared postcesarean incidence, severity, and duration of low O₂ saturation (SpO₂), monitored by a telemetric pulse oximetry network (TPON), in women who had epidural or general anesthesia.

The study was approved by the institutional review board. ASA I or 2 women undergoing cesarean section received general (GA) or epidural anesthesia (EA) according to their preference. GA (n = 11) consisted of rapid sequence induction, maintenance with 50% N₂O and O₂, and isoflurane and, after operation, intermittent parenteral morphine as needed (GA/P). EA consisted of 2% lidocaine with epinephrine and after delivery either epidural morphine, 4-5 mg, (n = 10 [EA/E]) or the same regimen as the GA group (n = 11 [EA/P]). All patients were monitored for 24 h after operation in the postpartum ward by TPON; SpO₂, heart rate, and plethysmography were recorded every 10 s by computers, and pain by visual analog score (VAS), somnolence, respiratory rate, and side effects were recorded every 30 min to every 2 h. Data were analyzed by chi square, unpaired t test, ANOVA, or Tukey as appropriate.

Demographics and durations of operation and monitoring were similar in the 3 groups. SpO₂ < 92% occurred in all groups. The lowest incidence of low SpO₂ occurred with GA/P; the highest mean cumulative time of SpO₂ < 96% and < 92% occurred with EA/

E (not significant) (table). The longest episode of SpO₂ < 92% and the lowest SpO₂ occurred with EA/E.

The lower incidence of low SpO₂ in GA/P patients probably occurred because they had the highest VAS score (p < 0.05) despite highest amount of narcotic (p < 0.05). Continuous SpO₂ monitoring after cesarean section for 24 h is feasible; more study is needed to verify that such monitoring is efficacious.

TABLE. Low O₂ Saturation (SpO₂) After Cesarean Section with 3 Forms of Anesthesia and Analgesia

SpO ₂ (%)	GA/P (n = 11)	EA/E (n = 10)	EA/P (n = 15)
Cumulative Time of Low SpO ₂ (min [mean ± SD])			
< 96	395 ± 401	603 ± 389	515 ± 388
< 92	3.8 ± 5.7	26 ± 60	9.5 ± 15.9
< 90	1.3 ± 2.8	1.5 ± 1.5	2.0 ± 2.7
< 88	0.5 ± 1.2	0.5 ± 0.6	1.0 ± 1.5
< 85	0.1 ± 0.4	0.1 ± 0.4	0.5 ± 0.9
< 80	< 0.01	< 0.01	0.1 ± 0.3
Patients with ≥ 1 Episode of Low SpO ₂ Longer Than 1 Min (n, %)			
< 96	10 91%	10 100%	15 100%
< 92	1* 10%	5 50%	9 60%
< 90	1 10%	2 20%	3 20%
< 88	1 10%	1 10%	1 7%
< 85	0 --	1 10%	0 --
< 80	0 --	0 --	0 --

Groups are described in the text.

*p < 0.05 compared with EA/E or EA/P.