

TITLE: ANESTHESIA OUTCOME IN THE MORBIDLY OBSE PARTURIENT
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Morbid obesity increases surgical and anesthetic risk in the nonpregnant patient. In this study, we examine the management and outcome of morbidly obese patients presenting for delivery at our institution.

We prospectively collected all anesthesia records for patients delivering between Sept 1978 and Nov 1989 whose weight exceeded 300 pounds at the time of delivery. Statistical methods were ANOVA, Chi-square test, Student's t-test, Pearson's product-moment correlation, Probit regression analysis and Mann Whitely tests as appropriate with $p < 0.05$ significant.

117 patients with a mean weight of 329 ± 27 (S.D.) pounds and mean gestation of 39 ± 3 weeks delivered during the study period. Antenatal medical disease complicated 47% of pregnancies and included hypertension (28%), pregnancy induced hypertension (13%), and diabetes (12%). Mean gestation at the time of delivery was 39 ± 3 weeks. 62% of patients underwent cesarean section including 48% (42/87) of laboring patients. Failed induction and failure to progress were the most common indications for cesarean sections and 8% of patients required urgent intervention for fetal stress. Weight significantly

influenced cesarean section risk ($p=0.02$). Mean operative time was 77 ± 31 min. (range:13-190 min.) and significantly associated with weight ($p<0.03$). No vaginal delivery patients suffered postpartum complications. However, 35% of cesarean section patients experienced postoperative morbidity and these complications were also significantly associated with weight ($p<0.002$). Mean hospitalization was 6 ± 5 days. There were no maternal deaths or immediate neonatal deaths. Neonatal weight was 3444 ± 748 gm.

94% of all patients electing epidural anesthesia eventually obtained successful epidurals. However, 37 of 80 epidurals required replacement and 17 of 80 patients required 3 or more epidurals. Increasing patient weight significantly influenced successful epidural placement for residents ($p<0.02$), but not attending anesthesiologists ($p=0.8$). Three patients experienced dural punctures (4%).

Seventeen patients (24%) received general anesthesia for cesarean section and in one third of these patients, intubations were difficult. Four patients received spinal anesthesia while 51 patients received epidural anesthesia for cesarean section.

Morbidly obese patients suffer significant risks for abdominal delivery and postoperative complications. Our data suggests that epidural anesthesia is feasible in this patient population. However, initial epidural failure rate is high, but surmountable with persistence. In contrast, this study also demonstrates the hazards of general anesthesia since one third of our intubations are characterized as difficult.

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TITLE: ESTROGEN-INDUCED INCREASE IN CARDIAC SENSITIVITY TO BUPIVACAINE
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The cardiac toxicity of bupivacaine (B) appears to be enhanced in pregnant animals compared to non-pregnant animals.¹ Moreover, chronically elevating progesterone (PROG) blood levels in rabbits has been reported to increase myocardial sensitivity to B's depressive effects.² Since estrogen levels are elevated during pregnancy, the current study was initiated to determine whether acutely elevated β -estradiol (EST) levels, in vitro, would alter myocardial sensitivity to LA.

Ovariectomized rabbits (2-3 kg) were anesthetized and euthanized. The hearts were quickly removed and placed in warm (37°C) aerated (95% O₂, 5% CO₂) bicarbonate Tyrode's solution containing 4.0 mM KCl at pH 7.35. Action potentials were recorded via glass microelectrodes from the Purkinje fibers (PF) and ventricular muscle (VM) of the right septal wall stimulated at a rate of 2.5 Hz. Following baseline recordings the preparations were exposed to EST (1 ng/ml) for 30 min fol-

lowed by either B (1, 3 and 5 μ g/ml) or lidocaine (L; 5, 10 and 20 μ g/ml) concomitantly superfused with EST. The data were analyzed using a Student's t test with a significance level set at $P < 0.05$.

EST alone did not alter action potential parameters. EST + B significantly decreased action potential amplitude and maximal rate of phase zero depolarization (Vmax) at all concentrations. EST + B decreased Vmax significantly greater than B alone at 3 μ g/ml.

EST + L significantly decreased PF Vmax at all concentrations. However, there was no difference between the effects of EST + L and L alone on Vmax.

Table

	Vmax	AMP	
Control	100%	100	
B-3 μ g/ml	47	90	
B + EST	28*	80	* $P<0.05$
L-20 μ g/ml	75	98	vs B-3
L + EST	55	91	

EST, a sex steroid elevated during pregnancy, increased myocardial sensitivity to B and further supports B's cardio-depressant effects during pregnancy.

References

1. Morishima et al. Anesthesiology 63:134-39, 1985.
2. Moller et al. Anesthesiology 69:A675, 1988.