Relationship between low-dose epidural analgesia and obstetric laceration location and severity

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Introduction

- Lacerations at the time of vaginal delivery contribute to vulvar and perineal pain, dyspareunia, pelvic organ prolapse, and urinary and fecal incontinence[1-4]
- Low-dose epidural analgesia (LDEA) provides pain relief while minimizing medication side effects
- Previous studies have demonstrated that epidural analgesia for pain relief during labor is not an independent risk factor for severe perineal lacerations, and may in fact be protective[5-8]
- The relationship between epidural analgesia, specifically LDEA, and all other lacerations has not been well studied[9-10]

Objectives

- To characterize the **relationship between LDEA and perineal laceration severity**
- To characterize the **relationship between LDEA and distribution of all lacerations**

Study design

- **Single-center, retrospective cohort study of all vaginal deliveries with vertex, singleton gestations ≥34 weeks GA in patients with no prior vaginal deliveries,** from 7/2013 – 10/2018[11]
- Exclusion criteria: patients with shoulder dystocia, episiotomy, operative vaginal delivery, or multiple gestation
- We compared laceration severity and location between women with and without LDEA
- **Primary outcome: rate of any perineal laceration**
- **Secondary outcomes: rates of 1st-degree, 2nd-degree, severe perineal, anterior vulvar** (periurethral or labial)**, sulcal or cervical lacerations**
- Fischer's exact test, Chi-square test, Mann Whitney U test, univariate regression and multivariate regression were performed with $p<0.05$ considered statistically significant

Patient demographics and labor characteristics

	LDEA n=7316 N (%)	No LDEA n=1228 N (%)	p-Value
Demographics			
Age (years)	32 (6) [n=7294]	32 (6) [n=1214]	0.971
BMI	27.2 (5.0) [n=6806]	26.7 (4.6) [n=1096]	**<0.001**
Race			
Asian	1131 (15.5)	170 (13.8)	
Black	300 (4.1)	49 (4.0)	
White	4907 (67.1)	827 (67.3)	0.220
Other	639 (8.7)	114 (9.3)	
Mixed	114 (1.6)	16 (1.3)	
Unknown	225 (3.1)	52 (4.2)	
Ethnicity			
Spanish/Hispanic	537 (7.3)	80 (6.5)	
Non-Spanish/ Hispanic	6529 (89.2)	1081 (88.0)	**0.002**
Unknown	250 (3.4)	67 (5.5)	
Past or current smoker	870 (12.4) [n=7043]	133 (11.5) [n=1161]	0.387
Labor characteristics			
Gestational age (weeks)	39.9 (1.6)	39.7 (1.6)	**<0.001**
Induction/ Augmentation	6107 (83.5)	509 (41.4)	**<0.001**
First stage duration (hours)	10.8 (9.3) [n=2419]	7.3 (8.9) [n=378]	**<0.001**
Second stage duration (hours)	1.4 (1.5) [n=5131]	0.6 (0.9) [n=743]	**<0.001**
Fetal position	[n=5918]	[n=952]	0.629
OA	5680 (96.0)	915 (96.1)	
OP	190 (3.2)	32 (3.4)	
OT	48 (0.8)	5 (0.5)	
Birth weight (g)	3275 (560) [n=7251]	3249 (561) [n=1218]	**0.006**
Birth weight ≥4000 g	334 (4.6) [n=7251]	46 (3.8) [n=1218]	0.196

Comparison of laceration location and severity

Laceration	LDEA n=7316 N (%)	No LDEA n=1228 N (%)	OR (95% CI)	p-Value
Any perineal	6504 (88.9)	1042 (84.9)	1.43 (1.20-1.70)	**<0.001**
1st degree	2003 (27.4)	353 (28.7)	0.93 (0.82-1.07)	0.321
2nd degree	4224 (57.7)	644 (52.4)	1.24 (1.10-1.40)	**0.001**
3rd or 4th degree	267 (3.6)	40 (3.3)	1.13 (0.80-1.58)	0.494
Anterior vulvar	1378 (18.8)	269 (21.9)	0.83 (0.71-0.96)	**0.012**
Sulcal	391 (5.3)	71 (5.8)	0.92 (0.71-1.19)	0.531
Cervical	27 (0.4)	2 (0.2)	2.27 (0.54-9.56)	0.422

Multivariate regression for any perineal laceration

Regression Category	aOR (95% CI)	p-Value
LDEA	**1.40 (1.11 – 1.75)**	**0.004**
Race	**1.16 (1.08 – 1.26)**	**<0.001**
Ethnicity	**0.73 (0.55 – 0.92)**	**0.007**
Gestational age	0.95 (0.89 – 1.02)	0.186
Second stage duration	0.996 (0.92 – 1.07)	0.918
Birth weight	**0.9992 (0.9990 – 0.9995)**	**<0.001**

Results

- Patients with LDEA were at increased risk of perineal lacerations, specifically 2nd-degree perineal lacerations
- After multivariate anaylsis to adjust for demographic and labor differences between the groups, LDEA remained a risk factor for any perineal laceration
- LDEA was associated with a lower risk of anterior vulvar laceration
- There were no differences between groups in the rates of 1st-degree, severe perineal, sulcal or cervical lacerations

Conclusions

- Women with LDEA were at increased risk of perineal lacerations, particularly 2nd-degree lacerations
- LDEA was not associated with an increased risk of severe perineal lacerations

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