

HYPOTHESIS

•The electrical uterine activity of induced labor differs physiologically from that of spontaneous labor.

OBJECTIVE

•To characterize the electrical uterine activity during induced labor in comparison to spontaneous labor.

MATERIALS AND METHODS

•Patients presenting to Labor and Delivery between January 1, 2008 and January 1, 2009, meeting inclusion and exclusion, criteria were recruited into a prospective, blinded, IRB-approved study.

MANAGEMENT PROTOCOL

INCLUSION CRITERIA:

- Admitted at ≥34 weeks GA in spontaneous labor or for indicated induction
- Vertex
- Singleton

EXCLUSION CRITERIA:

- Spontaneous labor patients requiring pitocin augmentation to effect delivery
- Multiple gestation
- Malpresentation
- IUGR (<10th %ile) with abnormal doppler studies
- Anomalous fetus
- Elective shortening of second stage

Spontaneous labor

Induced labor

±Cervical Ripening

Pitocin Induction

At study entry:

- Baseline cervical exam & EUM
- Throughout labor:**
- Cervical exam as clinically indicated
- EUM as cervical dilatation progresses

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- Baseline cervical exam & EUM
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- Maternal and neonatal outcome data obtained from medical records.
- EUM data recorded and sent offsite to analyst blinded to clinical data.
- Student's *t* test used for all numerical data and Chi-square and Fisher's exact test used for categorical data.

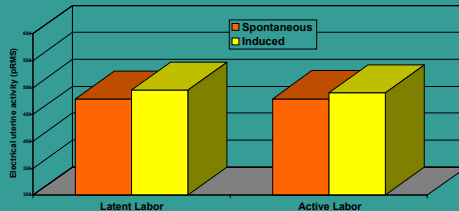
RESULTS

Demographics

	Spontaneous Labor (n=42)	Induced Labor (n=40)	P-value
Age	31.5±5.9	32.0±5.7	NS
Race (white/other)	50%/50%	47.5%/52.5%	NS
BMI	23.0±4.02	25.1±4.9	NS
Parity (nullip/multip)	59.5%/40.5%	60%/40%	NS
Gestational Age	39.5±1.35	39.1±1.49	NS
Birthweight	3371±463	3372±570	NS

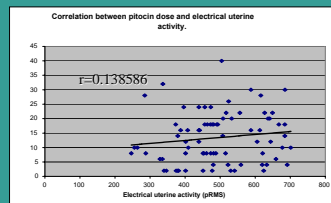
•No differences in baseline demographics.

Electrical uterine activity in spontaneous and induced labor

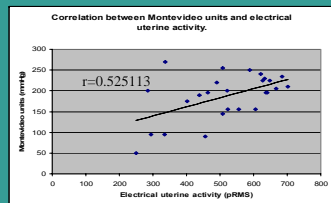


•Electrical uterine activity during latent labor (<4cms) was not different between the 2 groups. (p=0.699)

•Electrical uterine activity during active labor (≥4cms) was not different between the 2 groups. (p=0.706)



•No correlation was found between the level of electrical activity during induction and pitocin dose.



•Positive correlation was found between electrical uterine activity measured in pRMS and intrauterine pressure measured in Montevideo units.

EUM-100

EUM-100:

- Multi-channel electromyogram monitor
- 9 evenly spaced electrodes
- 3-dimensional position sensor
- Signal amplifier
- High-pass and low-pass filters
- Unit of electrical uterine activity = pRMS (peak root mean square)
- $pRMS = \sqrt{\text{mean} \times [\text{voltage waveform}]^2 \text{ time}}$



QuickTime™ and a decompressor are needed to see this picture.

CONCLUSIONS

- The electrical uterine activity achieved during induced labor is not significantly different than in spontaneous labor.
- The level of electrical uterine activity during induction does not correlate with pitocin dose, suggesting that patient's response to pitocin has marked individuality.
- The electrical uterine activity as measured with the EUM-100 does correlate with that measured in Montevideo units via intrauterine pressure catheter.