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## Background

- In 2014, ACOG and SMFM published guidelines for the management of labor to decrease the rising cesarean section rate in the United States
- Second stage should be at least 2 and 3 hours for multiparous and nulliparous women, respectively. An additional hour should be allowed for women with an epidural.
- An absolute maximum length of time in the second stage beyond which all women should undergo operative delivery has not been identified.
- Prior research has shown that additional time be allowed, given rates of vaginal birth are high and overall complications are low.
- At Mount Sinai West, due to several poor obstetric outcomes in the face of prolonged second stage of labor, we decided to review our own data.

## Objective

- The goal of this study is to describe the consequences of prolonged second stage of labor on maternal and neonatal outcomes.

## Methods

- IRB-approved retrospective cohort study which included 700 women with a singleton term pregnancy who delivered at Mount Sinai West between March 2018 to March 2020
- 350 patients with prolonged second stage (defined as >3h), and 350 patients with normal second stage, matched for age and parity
- Exclusion criteria: multiple gestation, preterm, malpresentation, IUFD
- Patient medical records were reviewed and demographic and delivery outcomes were collected
- Primary outcome is a binary composite of maternal adverse outcomes, which was defined as postpartum hemorrhage, 3rd or 4th degree perineal laceration, episiotomy, emergency C-section, chorioamnionitis, endometritis, or ICU admission.
- Multivariable linear and logistic regression models were created in which demographic variables were adjusted for as confounders.

## Results

- Incidence of composite maternal adverse outcome was significantly higher for the prolonged second stage group (36 vs. 18%, p<0.0001)
- Patients in the prolonged group had a significantly higher rate of C-section (38 vs. 2%, p<0.0001) or operative delivery (23 vs. 13%, p<0.0001)
- On multivariable analysis, patients in the prolonged group had a significantly higher likelihood of a maternal adverse outcome compared to patients in the normal group (OR 2.4, 95% CI: 1.6, 2.6; p<0.0001).
- Newborns in the prolonged group had increased incidence of respiratory distress (12 vs. 3%, p<0.0001) & meconium aspiration (2.9 vs. 0.3%, p=0.006), compared to the normal group.
- The rate of NICU admission was higher in the prolonged group compared to the normal group (7 vs. 3%, p=0.03).

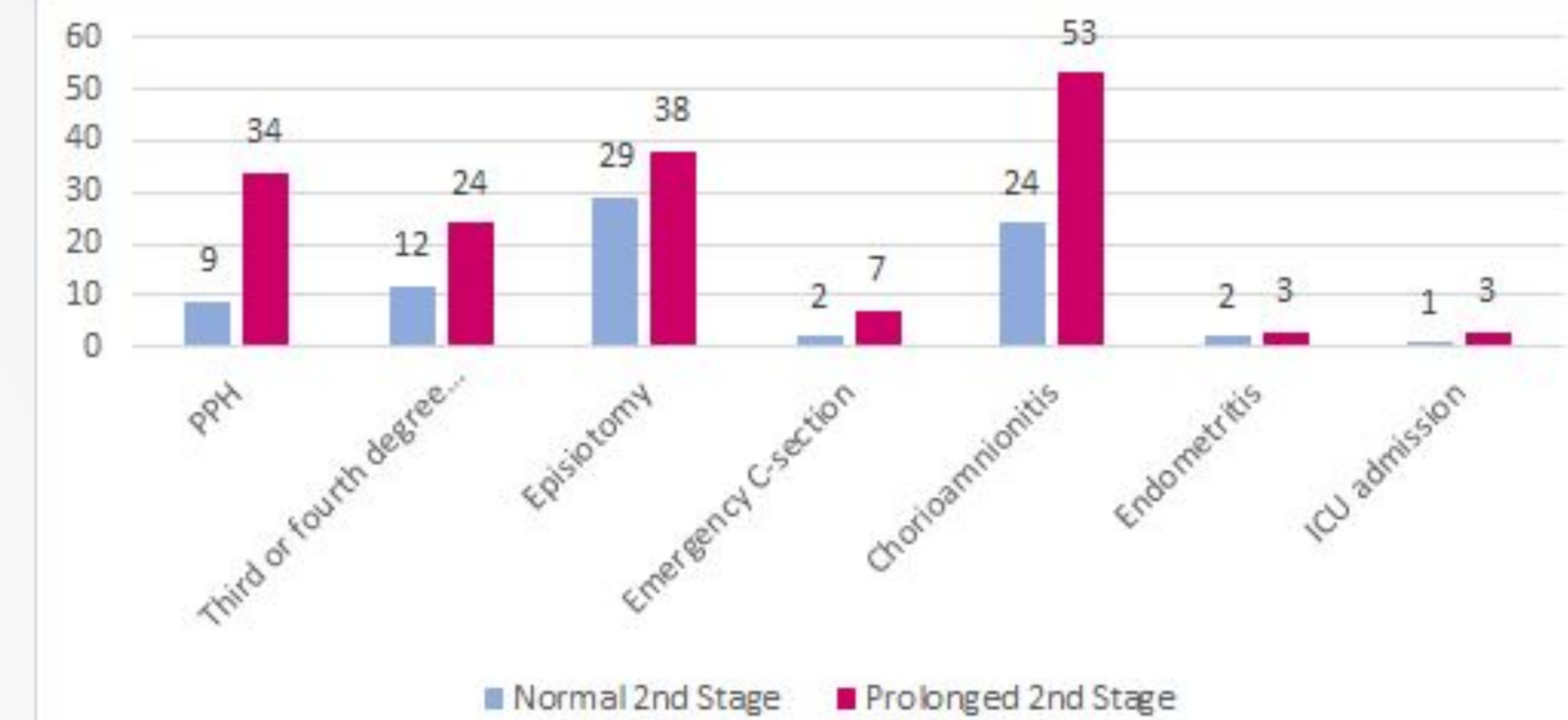
Variable	Overall (N = 700)	Normal 2nd Stage (N = 350)	Prolonged 2nd Stage (N = 350)	P value
Maternal age – mean (± SD)	33.8 (± 4.7)	33.8 (± 4.7)	33.8 (± 4.7)	0.9871
BMI, kg/m <sup>2</sup>	28.7 (± 4.5)	28.3 (± 4.1)	29.1 (± 4.7)	0.0097
Parity	1.1 (± 0.3)	1.1 (± 0.4)	1.1 (± 0.3)	0.474
GA at delivery, weeks	39.8 (± 1.0)	39.6 (± 1.0)	39.9 (± 1.1)	0.0014
2nd stage labor, minutes	201.5 (163.1)	72.8 (± 47.2)	330.2 (± 133.6)	<.0001

**Table 1. Select Baseline Characteristics**

Variable	Overall (N = 700)	Normal 2nd Stage Labor (N = 350)	Prolonged 2nd Stage Labor (N = 350)	P value
Respiratory distress	53 (7.6)	11 (3.1)	42 (12.0)	<.0001
Meconium aspiration	11 (1.6)	1 (0.3)	10 (2.9)	0.0062
Sepsis	9 (1.3)	5 (1.4)	4 (1.1)	1
NICU admission	34 (4.9)	11 (3.1)	23 (6.6)	0.0349

**Table 2: Comparison of neonatal outcomes between groups**

## Results



**Figure 1. Comparison of maternal outcomes between groups**

## Conclusions

- Women with term, singleton pregnancies with prolonged second stage of labor have a significantly higher likelihood of a maternal adverse outcome compared to patients in the normal group.
- The next step is to present our findings at an institution-wide quality improvement meeting and encourage new policy formation.
- There is a need to be able to identify patients at high risk for complications and increase surveillance by having more efficient huddles, improved documentation, and increased utilization of second opinions to prevent adverse maternal and neonatal outcomes.
- Our data suggests that ACOG/SMFM should consider readdressing the guidelines for management of prolonged second stage in the face of this increased morbidity.

## References

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