

## Background

- Preterm birth rates for singleton pregnancy in the United States 2015 were 7.82% at <37 weeks and 1.23% at <32 weeks
- Cervical dilation during the second trimester is associated with a 90% rate of preterm birth (PTB)
- Cervical dilation is an independent of risk factor for PTB, not affected by: history of a prior delivery, cone biopsy, müllerian anomaly, or ≥2 dilation and evacuation
- Physical exam indicated cerclage (PEIC) in a large case control study decreased PTB <37 weeks by 73% and <32 weeks by 69%

## Objective

To evaluate the predictors of preterm birth <32 weeks in women that underwent physical exam indicated cerclage (PEIC) in singleton pregnancy.

## Study design

- Multicenter retrospective study
- Inclusion criteria: Asymptomatic singleton pregnancies with cervical dilation 1-5 cm between 16 0/7 to 23 6/7 weeks who underwent PEIC from 2003-2017
- Exclusion criteria: Cases with abnormal karyotype, major fetal anomalies, chorioamnionitis and revision of a history-indicated cerclage

## Study Design

- Prolapsed membranes was classified in 2 groups for analysis: From internal os (dilated by digital exam but not visible membranes) to less than 50% prolapse into the endocervical canal and from 50% endocervical canal to external os
- Primary outcome: delivery <32 weeks
- Analysis: Fisher's exact test and multivariable logistic regression. Kaplan-Meier survival curve

## Results

- 198 women underwent PEIC.
  - Demographic characteristics stratified by delivery <32weeks vs. ≥32weeks are shown in Table 1
  - **Women that delivered <32 weeks had cervical dilation at earlier gestational age (GA), higher incidence of cervical dilation ≥2cm and higher incidence of prolapsed membranes at the external os**
  - The incidence of preterm birth <37, <34, <32, <28 and <24 weeks were 57.5%, 42.9%, 35.8%, 29.3% and 18.7% respectively
  - The interval from cerclage to delivery was 12.2±6.9 weeks
  - Premature preterm rupture of membranes (PPROM) was present in 54 women (27.3%)
  - Perinatal mortality was 34 (17%), half of them associated with PPRM before 24 weeks
- Significantly associated with PTB <32 weeks:
- Prolapsed membranes to external os: 43/71 (60.5%) vs 37/127 (29.1%) [OR 4.2, 95% CI:2.5-7.2]
  - Cervical dilation ≥2 cm: 44/71 (61.9%) vs 50/127 (25.2%) [OR 2.5, 95% CI:1.38-4.5]
  - Gestational age at diagnosis <20 weeks: 34/71 (47.8%) vs 36/127 (28.3%) [OR 2.3, 95% CI:1.26-4.2]

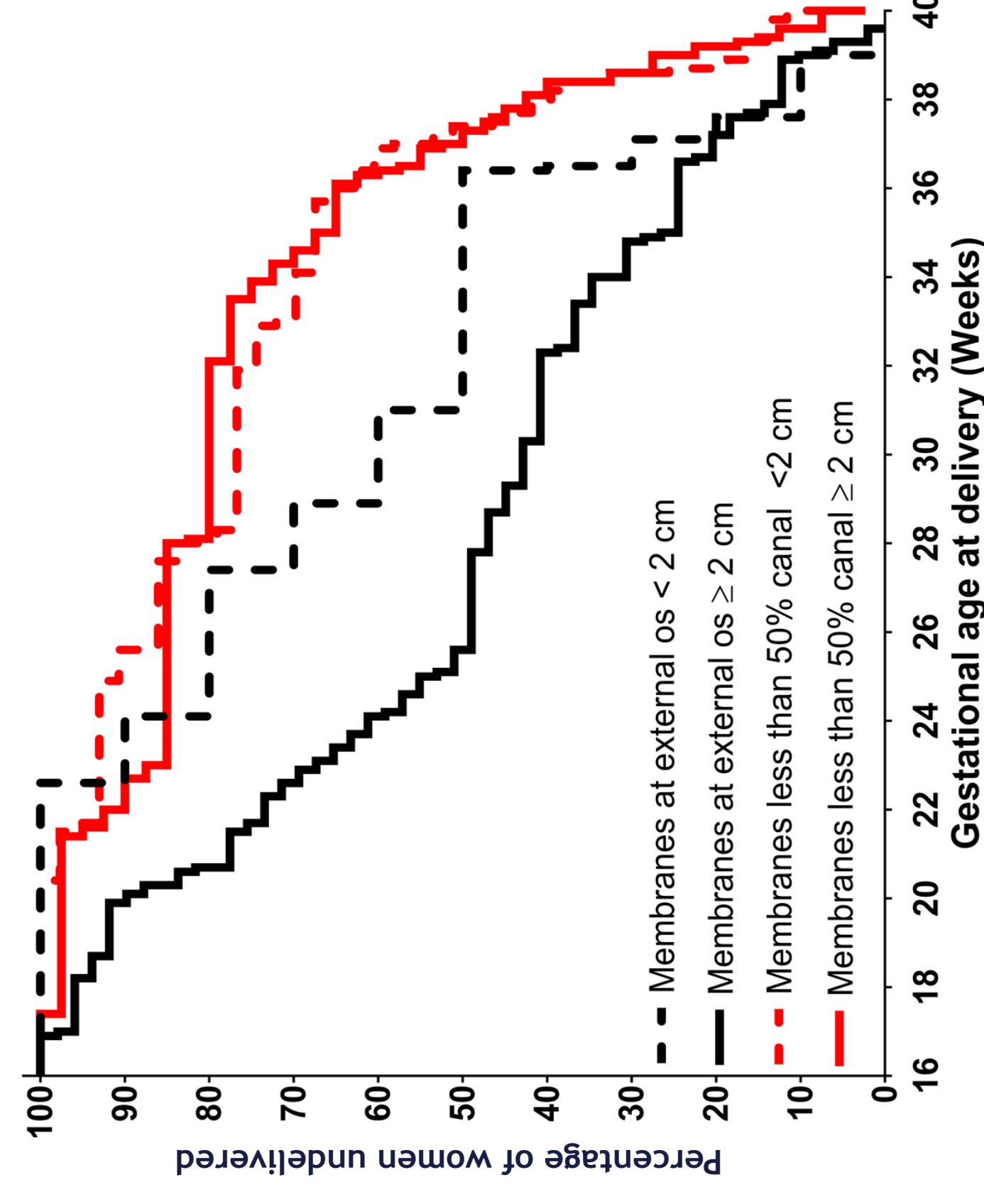
## Results

Table 1: Maternal demographic characteristics stratified by gestational age at delivery <32weeks vs. ≥32weeks.

VARIABLE	Overall (n=198)	Delivery <32 weeks (n=71)	Delivery ≥32 weeks (n=127)	p-value
Maternal Age (years)	30.46±5.8	30.88±6.14	30.23±5.6	0.3
History of PTB	57 (28.8)	25 (35.2)	35 (27.5)	0.2
GA at Cerclage (weeks)	20.3±2.0	19.99,2±1.9	20.45±2.1	0.4
Cervical Dilation (cm)	1.69±0.85	2.0±0.9	1.58±0.73	0.09
Cervical Dilation ≥2 cm	94(47.4)	44 (61.9)	50 (25.2)	0.003
GA at Cerclage <20 weeks	70(35.3)	34 (47.8)	36 (28.3)	0.008
Shirodkar	63(31.8)	17 (23.9)	46(36)	0.08
McDonald	68 (68.2)	54 (76.1)	81 (63.7)	0.08
Amnioentesis	53 (26.7)	21 (29.5)	32(25.2)	0.5
Amnioreduction	33 (16.6)	9 (12.6)	24 (18.9)	0.3
Visible membranes at speculum	156 (78.8%)	65 (91.5%)	91 (71.65)	0.001
Degree of prolapsed membranes				
- From internal os to <50% endocervical canal	118 (59.6)	28 (39.4)	90 (70.8)	<0.0001
- From >50% endocervical canal to external os	80 (40.4)	43 (60.5)	37 (29.1)	<0.0001

Data are presented as number (percentage) or as mean ± standard deviation GA gestational age, PTB, preterm birth. P<0.05 was considered significant

Figure 1 Cumulative number of women undelivered after PEIC stratified by cervical dilation and degree of prolapsed membranes



## Results

Figure 2: Cumulative number of women undelivered after PEIC with prolapsed membranes up to 50% endocervical canal stratified by cervical dilation

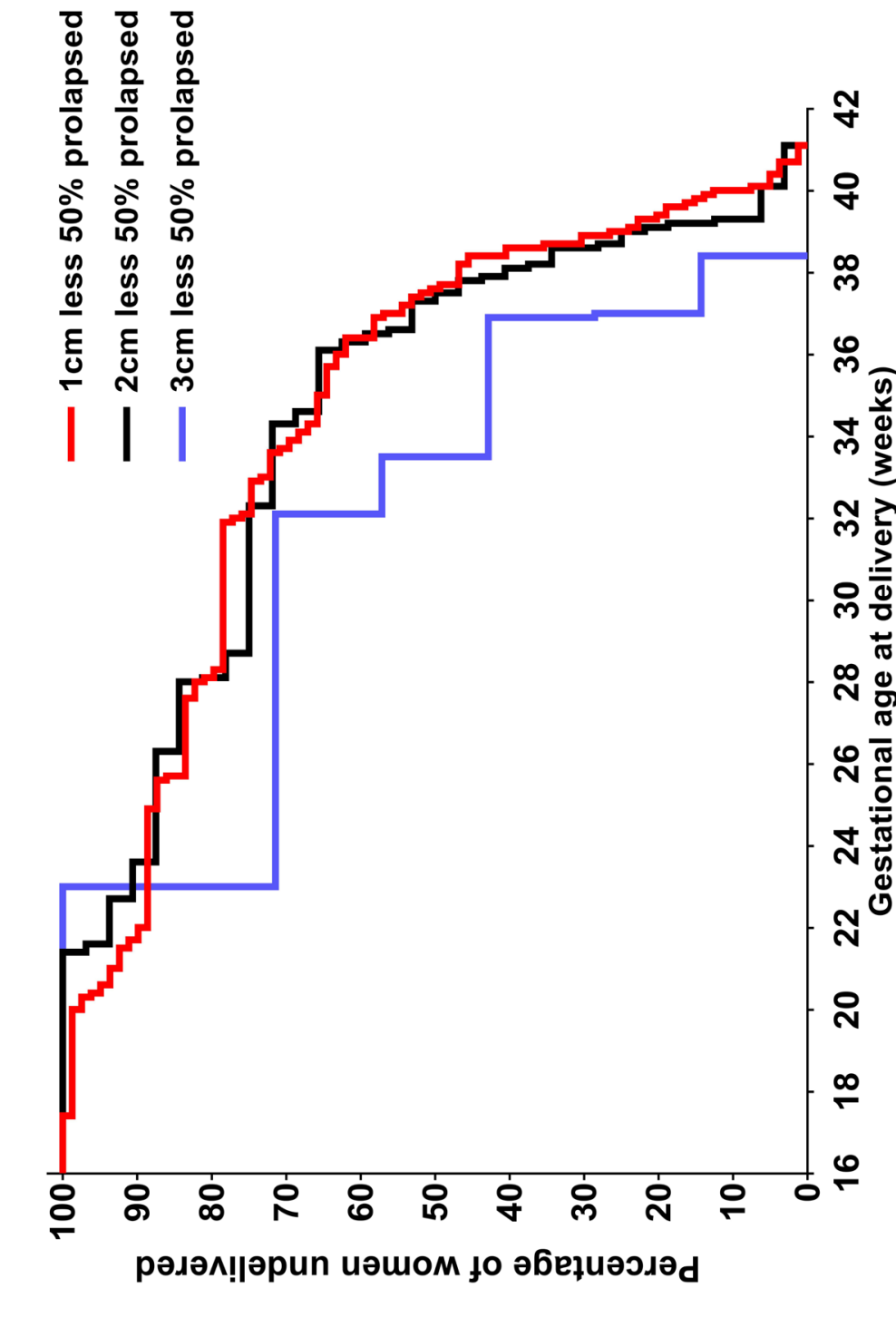
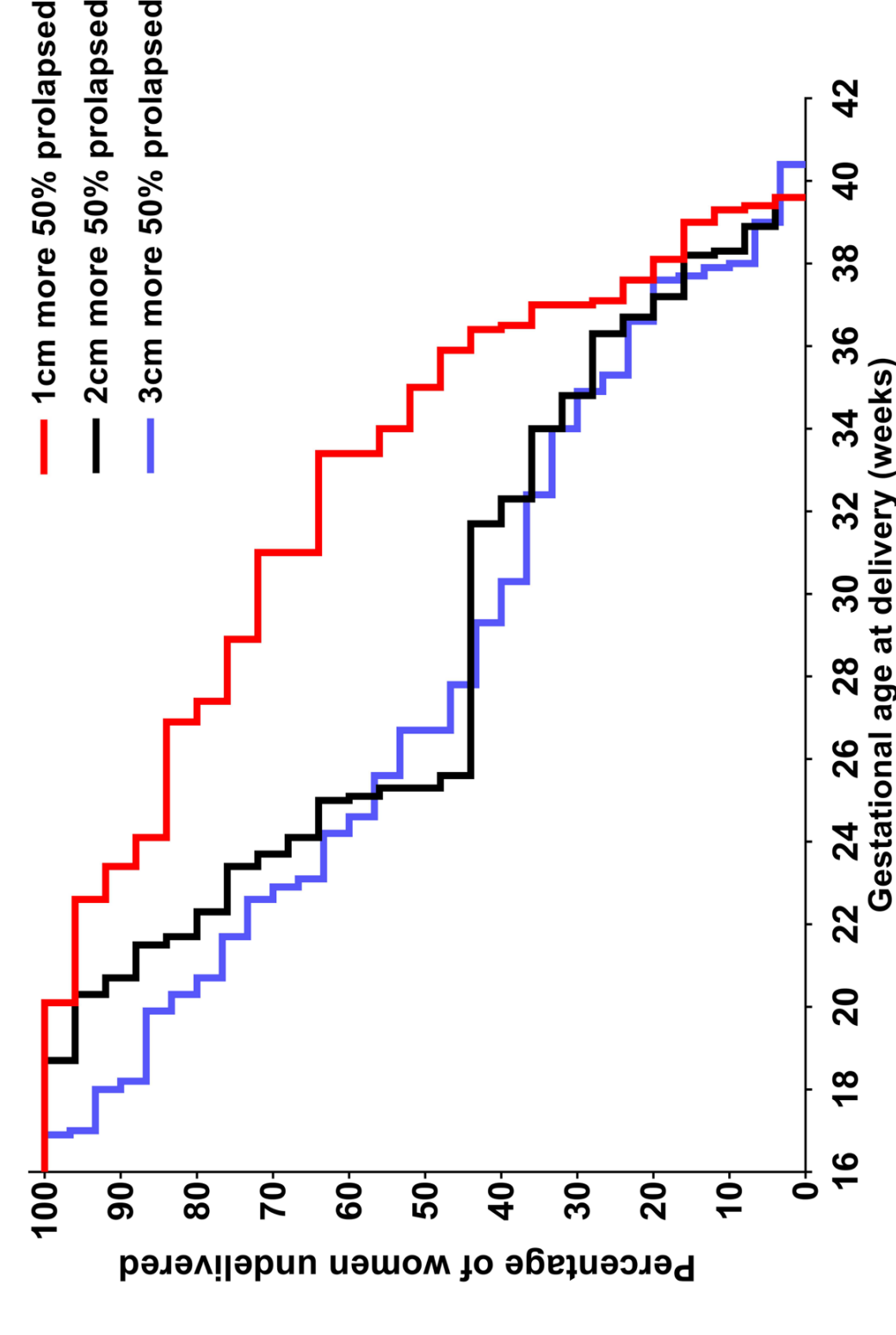


Figure 3: Cumulative number of women undelivered after PEIC with prolapsed membranes from 50% endocervical canal to external os stratified by cervical dilation



## Conclusion

**Prolapsed membrane to external os was the strongest predictor of preterm delivery <32weeks in women with singleton pregnancy and 1-5 cm of cervical dilation between 16 to 24 weeks that underwent physical exam indicated cerclage (PEIC)**