

## Abstract

**Objective:** To evaluate the level of maternal physical activity effect on the perinatal outcomes of women with preterm premature rupture of membranes (PPROM)

**Study Design:** This is a pilot, prospective, observational multicenter cohort study. We approached patients admitted between 23 0/7 weeks to 32 0/7 weeks gestation with confirmed PPRM between January of 2014 and June of 2017. All patients received corticosteroids and latency antibiotics. Enrollment was done on third day of admission. Delivery occurred at 34 weeks per protocol via induction of labor or cesarean section as obstetrically indicated; or sooner if chorioamnionitis was diagnosed or spontaneous preterm labor occurred. Patients were provided a pedometer to wear for the duration of their antepartum course and they have maternal activity at 1lb and were encouraged to go to the physical therapy gymnasium.

**Results:** We enrolled 32 women. We stratified them in two groups: low activity as less than 500 step a day and higher maternal activity more than 500 steps a day. There were no significant differences in the demographics. Latency from PPRM to delivery were significantly prolonged in women with maternal activity > 500 steps a day: 11.0 ± 8.42 vs 21.18 ± 4.26 days p = 0.004. No maternal or fetal adverse outcomes were identified.

**Conclusion:** Maternal activity more than 500 steps a day showed a significant association with prolongation of latency from PPRM to delivery in this study without adverse events.

## Background

- Preterm premature rupture of pregnancy (PPROM) occurs in 3% of all deliveries and is associated with preterm birth (PTB)
- Despite of lack of evidence that bedrest increases the latency period, many practitioners still recommend strict bedrest for patients admitted with PPRM
- Bedrest has been shown to increase the risk for adverse maternal outcomes
  - Venous thromboembolism
  - Muscle atrophy
  - Bone demineralization
  - Emotional/psychological distress

## Objective

To evaluate the level of maternal physical activity effect on the perinatal outcomes of women with PPRM

## Study Design

- Prospective, observational multicenter cohort study
- We approached patients admitted between 23 0/7 weeks to 32 0/7 weeks gestation with confirmed PPRM between January of 2014 and June of 2017
- All patients received corticosteroids and latency antibiotics
- Exclusion criteria delivery within the first 48 hours
- Delivery occurred at 34 to 36 weeks per hospital protocol via induction of labor or cesarean section as obstetrically indicated; or sooner if chorioamnionitis was diagnosed or spontaneous preterm labor occurred
- Patients were provided a pedometer to wear for the duration of their antepartum course and they were allowed maternal activity at 1lb
- Steps by day were divided by the number of days until delivery
- Analysis: Fisher's exact test. Linear regression

## Results

- We enrolled 32 women
- We stratified them in two groups:
  - Low activity as less than 500 step a day
  - Higher maternal activity more than 500 steps a day
- There were no significant differences in the demographics
- Latency from PPRM to delivery were significantly prolonged in women with maternal activity ≥ 500 steps a day: 21.18 ± 4.26 days versus 11.0 ± 8.42 p = 0.004
- No maternal or fetal adverse outcomes were identified

## Results

Table 1. Maternal characteristics stratified by level of maternal activity

	Total Cohort (n=32)	Walk ≥500 steps a day (n=14)	Walk <500 steps a day (n=18)	P value
Age (years)	30.56±4.2	29.0 ± 3.6	33.2 ±5.1	0.4
White	7 (21.8)	3 (21.4)	4 (22.2)	1.0
Black	23 (71.8)	10 (71.4)	13 (72.2)	1.0
Hispanic	2 (6.2)	1 (7.1)	1 (5.5)	1.0
Private Insurance	13 (40.6)	5 (35.7)	8 (44.4)	0.7
BMI	28.11±5.2	27.96± 3.8	28.05±6.4	0.9
Smoking	4 (12.5)	2 (14.2)	2 (11.1)	1.0
Nulliparous	12 (37.5)	5 (35.7)	7 (38.8)	1.0
History of PPRM/PTB	5 (15.6)	2 (14.2)	3 (16.6)	1.0
GA at PPRM (weeks)	28.5±2.7	28.3±2.8	28.6±2.9	0.8
Hypertensive Disorders	3 (9.3)	1 (7.1)	2 (11.1)	1.0
Diabetes (DM or GDM)	3 (9.3)	1 (7.1)	2 (11.1)	1.0

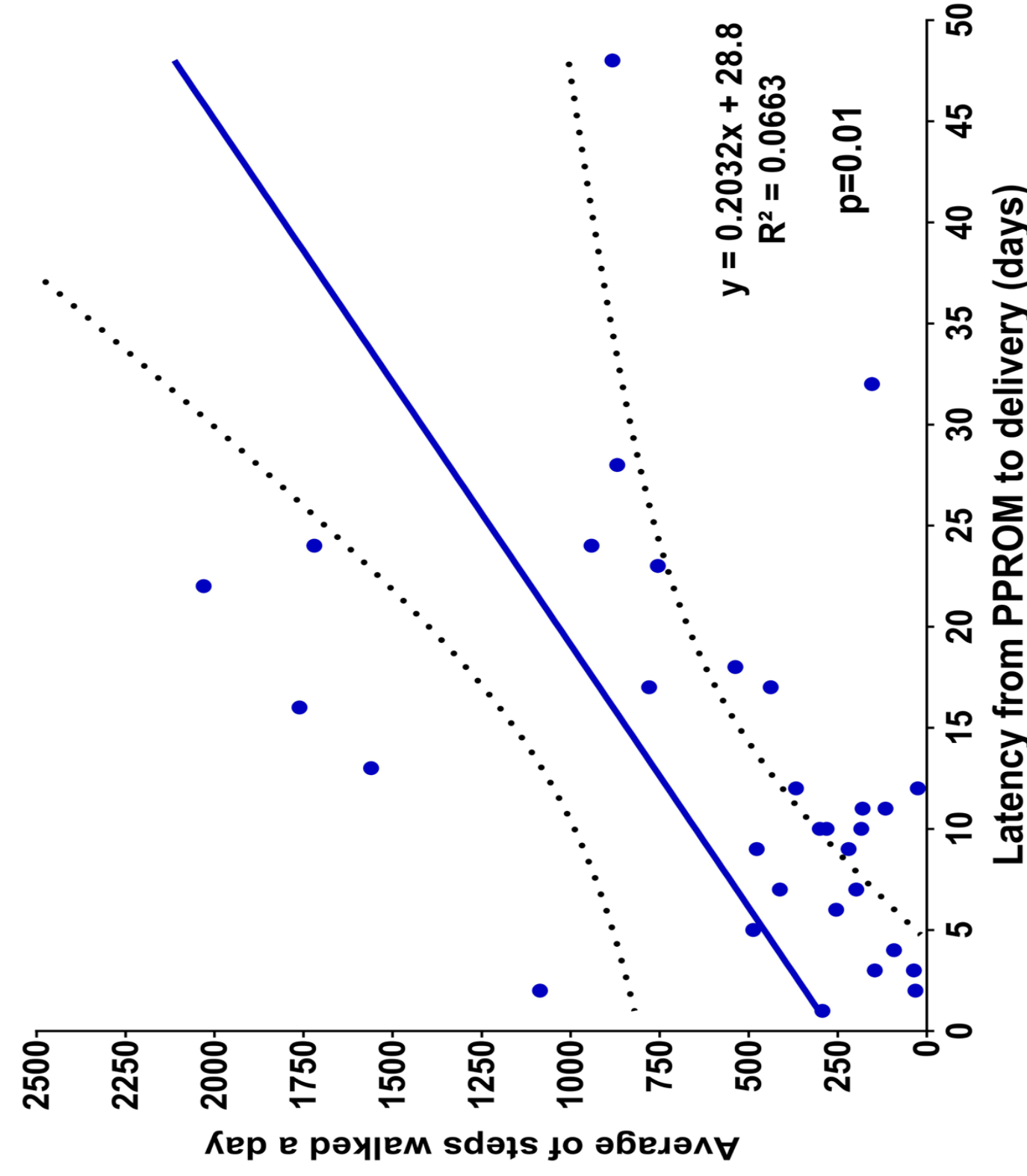
Table 2. Pregnancy outcomes stratified by level of maternal activity

	Total Cohort (n=32)	Walk ≥ 500 steps a day (n=14)	Walk < 500 steps a day (n=18)	P value
Gestational Age at DELIVERY (weeks)	31.18±2.7	31.47±2.9	30.7±2.62	0.31
Days between PPRM and Delivery	17.68±4.21	21.18 ± 4.26	11.0 ± 8.42	0.004
Birthweight (grams)	1697±589	1666±509	1629±653	0.89
Cesarean Delivery	9 (28.1)	3 (21.4)	6 (33.3)	0.69
Post-Partum Hemorrhage	1 (3.1)	1 (7.1)	0 (0)	0.43
Chorioamnionitis	4 (12.5)	2 (14.2)	2 (11)	1.0
Venous Thromboembolism	0	0	0	NA
Umbilical Cord Prolapse	0	0	0	NA

Data are presented as mean ± standard deviation or number (percentage). BMI: body mass index, PTB: preterm birth; GA: gestational age, PPRM: premature preterm rupture of membranes, DM: diabetes mellitus, GDM: gestational diabetes mellitus

## Results

Figure 1: Linear regression comparing the average of steps compared with latency from PPRM to delivery (days)



## Conclusion

Maternal activity more than 500 steps a day showed a significant association with prolongation of latency from PPRM to delivery in this study without adverse events.