

Quantitative fetal fibronectin testing in symptomatic women for spontaneous preterm birth prediction

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Background

Spontaneous preterm birth (PTB) affects 6.5% of deliveries in Hong Kong.

Quantitative fetal fibronectin (fFN) is currently under-utilized as a test for PTB prediction in Hong Kong.

Objectives

To evaluate the effectiveness of quantitative fFN in predicting spontaneous PTB in women with symptoms of threatened preterm labour in our population.

- Primary outcome : test characteristics of quantitative fFN in predicting spontaneous PTB <37 weeks.
- Secondary outcome : investigate relationship between fFN value and time to PTB

Design

A prospective, double blinded cohort study

Methods

- Women with a singleton gestation and preterm labour symptoms presenting to a tertiary hospital in Hong Kong between 24+0 to 33+6 weeks were recruited from 1st October 2020 and 31st October 2021.
- Women with vaginal bleeding, ruptured membranes and cervical dilation >3 cm were excluded.
- The attending obstetrician and the women were blinded to the result of fFN test; enabling unbiased management of the women.

Table 1 Demographic characteristics

	Total n = 48	PTB n = 10	Term delivery n = 38	p-value
Maternal age (IQR)	35 (5)	34 (6)	35 (5)	0.31
BMI at booking visit, median (IQR)	21.5 (3.6)	20.7(3.8)	21.9(4.6)	0.28
Gestational age of PTB symptoms (weeks),median(IQR)	29.2 (3.8)	30.7	28.9	0.82
Ethnicity				0.11
Chinese	45(94%)	8 (80%)	37 (97%)	
Japanese	1(2%)	0	1 (3%)	
Caucasian	2(4%)	2 (20%)	0	
Obstetric history				0.006
Nulliparous	32(67%)	3 (30%)	29 (76%)	
Multiparous	16(33%)	7(70%)	9(24%)	
History of PTB				0.13
Without a history of PTB	44(92%)	8 (80%)	36(95%)	
With a history of PTB	4(8%)	2 (20%)	2 (5%)	
Mode of delivery				0.57
Vaginal	23(48%)	4 (40%)	19 (50%)	
Caesarean section	25(52%)	6 (60%)	19 (50%)	
Delivery				
< 24 h from testing	4(8%)	4 (40%)	0	
< 48 h from testing	1(2%)	1 (10%)	0	
< 7 days from testing	2(4%)	2 (20%)	0	
< 14 days from testing	0	0	0	
> 14 days from testing	41(86%)	3 (30%)	38 (100%)	
Gestation at delivery				
< 34 weeks	6(13%)	6 (60%)	0	
34–37 weeks	4(8%)	4 (40%)	0	
> 37 weeks	38(79%)	0	38 (100%)	
Tocolysis use				0.001
Yes	21(44%)	9 (90%)	12 (32%)	
No	27(56%)	1 (10%)	26 (68%)	
Corticosteroid use				0.001
Yes	21(44%)	9 (90%)	12 (32%)	
No	27(56%)	1 (10%)	26 (68%)	

BMI: body mass index; IQR: interquartile range; PTB: preterm birth

Table 2 Spontaneous preterm birth rate within fetal fibronectin categories

fFN	n	%	PTB		Term births	PTB within 24 h	PTB in 24–48 h	PTB in 2–7 days	PTB in 7–14 days
(ng/mL)			PTB at < 34 weeks (n, %)	PTB at 34–37 weeks (n, %)	(n, %)	(n, %)	(n, %)	(n, %)	(n, %)
0–9	28	58	0	2(20%)	26(69%)	0	0	0	0
10–49	9	19	0	2(20%)	7(18%)	1(2%)	0	0	0
50–99	5	11	2(20%)	0	3(8%)	0	0	2(4%)	0
100–199	2	4	0	0	2(5%)	0	0	0	0
200–499	2	4	2(20%)	0	0	2(4%)	0	0	0
≥/=500	2	4	2(20%)	0	0	1(2%)	1(2%)	0	0

fFN: Fetal fibronectin, PTB: preterm birth

Note: 3 PTB (<37w) took place > 14 days of testing

Results

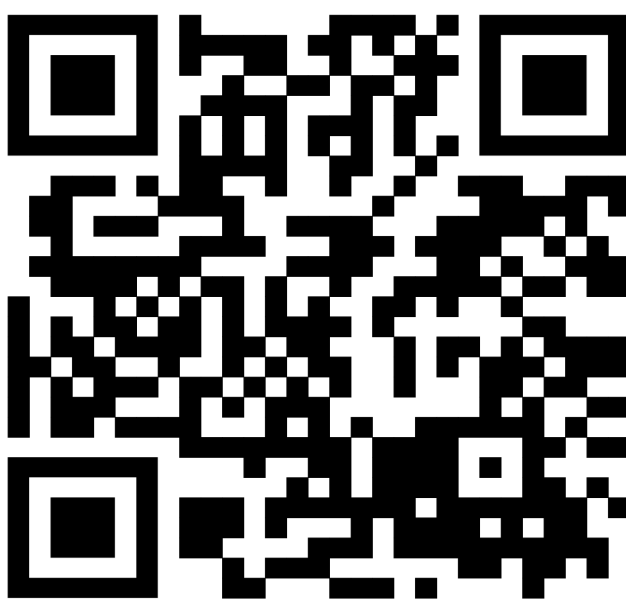
- 48 symptomatic women were recruited
- 10/48 (21%) mothers had PTB (< 37 weeks’ gestation). 7/48 (15%) had subsequent PTB within 14 days from testing and 5/48 (10%) delivered within 48 h.
- 38/48 (79%) had subsequent term deliveries
- 23/48 (48%) had vaginal delivery; 25/48 (52%) had Caesarean delivery.
- There is no statistical significant difference between age, BMI, history of previous preterm birth between the PTB and term delivery group
- The negative predictive value (NPV) of predicting delivery within 14 days was 97.3% and 100% when using a cut-off of <50ng/ml and <10ng/ml respectively.
- Using >200 ng/ml as cut-off could reliably predict delivery within 48 hours – 7 days with positive predictive value (PPV) of 100%; as well as PTB before 37 weeks.

Conclusion

- **Quantitative fFN has predictive value for spontaneous PTB prediction in symptomatic women in a Hong Kong population.**
- **fFN concentration could help clinicians rule out PTB and avoid unnecessary interventions and hospitalisation.**
- **Up to GBP £2500 could be saved per admission if the woman is stratified as low risk for PTB with fFN testing.**

References

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Full References