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Original Research Article

Characterization of Serum Progesterone Induced Blocking Factors Levels in Pregnancies with Preterm Delivery

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Abstract

Objectives: The progesterone-induced blocking factor may operate as a mediator for progesterone's effects on preserving pregnancy (PIBF). In order to forecast spontaneous early preterm delivery, this study intends to investigate the potential benefit of monitoring the maternal blood PIBF concentration between 11 and 13 weeks of pregnancy.

Methods: In 20 singleton pregnancies that later spontaneously delivered before 34 weeks and 50 control pregnancies that delivered at or after 37 weeks, the maternal blood levels of PIBF were measured between 11 and 13 weeks into the pregnancy. The values between the two groups were compared using the Mann-Whitney U test.

Results: When compared to women in the control group who gave birth at term 167.2 (interquartile range: 105.7-211.6 ng/ml), among women who delivered before 34 weeks, the median maternal serum PIBF concentration was 158.1 (interquartile range: 99.9 ~ 208.8 ng/ml). milliliter).

Conclusions: There is no effect on maternal blood PIBF levels at 11-13 weeks of gestation in preterm women.

Keywords: Progestrone-induced blocking factor, preterm delivery, early pregnancy, still birth

Introduction

Early delivery before 34 weeks is linked to the vast majority of mortality and morbidity, and preterm birth is the main cause of perinatal death and impairment in children.[1] Only 2% of singleton pregnancies end in an early delivery. Preterm prelabour rupture of membranes or spontaneous commencement of labour account for two thirds of these occurrences, whereas the remaining third is iatrogenic, primarily caused by pre-eclampsia. [2,3] Pregnancy can't be established and kept going without progesterone. It prevents myometrial contractility, and labour is believed to start as a result of progesterone withdrawal. Women who have previously given birth preterm and asymptomatic women with short cervixes have a 50% reduced risk of spontaneous preterm delivery.[4] A protein made by lymphocytes called progesterone-induced blocking factor mediates some of the effects of progesterone (PIBF).[5]

PIBF is essential for a healthy pregnancy. This is supported by data showing that PIBF is associated with depression in

women who are at risk of early miscarriage or premature birth.[6] The low T1/T2 ratio in healthy pregnant women is evidence that the T2 cytokine profile is important for the maintenance of pregnancy. The cytokine secretion profile is tipped toward the synthesis of T2 type cytokines by PIBF, which also aids in decreasing the activity of natural killer (NK) cells. [7,8]

A longitudinal study at 7-41 weeks' gestation indicated that women who miscarry or deliver preterm have significantly lower urine concentrations of PIBF than those who give birth at term. [9]

The objectives of the study to observe the women patients who go on to spontaneously deliver before 34 weeks had different first-trimester maternal serum PIBF concentrations.

Methods

The information used in this investigation came from a prospective screening trial for unfavourable obstetric outcomes in pregnant women who went to the hospital for their initial appointment as usual. At this appointment, which is scheduled for 11 to 13 weeks after conception, we take notes on the mother's physical characteristics and medical history.

In addition, perform an ultrasound to: (1) diagnose significant fetal abnormalities; (2) Determine gestational age by measuring fetal parietal length. (3) measuring the translucency of the term fetus as part of screening for chromosomal abnormalities; Maternal pregnancy-associated plasma protein A (PAPP-A) and free human chorionic gonadotropin will also be evaluated to assess patient-specific risk for trisomy 21. The fetal nuchal translucency is then combined with the data. Serum samples were kept at -80°C for further biochemical examination. The women who agreed to take part in the study provided written informed consent.

Data on pregnancy outcomes were gathered from the women's general practitioners or the maternity computerised records, and they were also included into our database.

All patients whose preterm deliveries occurred before 34 weeks had their obstetric records examined to determine whether the preterm delivery was medically essential or spontaneous. Both preterm pre-labor membrane ruptures and spontaneous labour started in these latter women.

The serum PIBF levels were assessed using the enzyme-linked immunosorbent test (ELISA).

Data were analyzed using the t-test to determine the significance of PIBF values in normal early pregnancies. Data were processed using Statistical Products and Services Solutions (SPSS) 22.0 for Windows.

Results

The participant's maternal characteristics, including age, history of previous miscarriage, current smoking, and alcohol consumption, were compared in Table 1 for the participants in the result groups.

Table 1: Maternal demographic data in the screed population.

Characteristics	Delivery after 37 weeks (n=50)	Delivery before 34 weeks (n=20)
Average maternal age in years	34	33.7
Average maternal weight in kg	64.7	64.5
Average maternal height in cm	166.3	165.6
Cigarette smoker (%)	8%	5%
Previous miscarriage (%)	28%	15%
Alcohol drinker (%)	42%	40%
Conception		
Spontaneous (%)	92%	100%
Ovulation induction drugs (%)	8%	0

Maternal age (p = 0.22), weight (p = 0.254), height (p = 0.357), smoking status (p = 0.239), or use of fertility options (p = 0.946) observed in maternity blood PIBF in other group. The median maternal serum concentration of PIBF was 158.1 (interquartile range: 99.9–208.8 ngml) among women who had given birth before 34 weeks compared with 167.2 (interquartile range: 105.7/2.11ml) for the women who had given birth after 34 weeks not in control of different terms women group (p = 0.520).

The PIBF serum was not homogeneous since both groups' PIBF serum variances were above 10%, as shown by variable coefficient data.

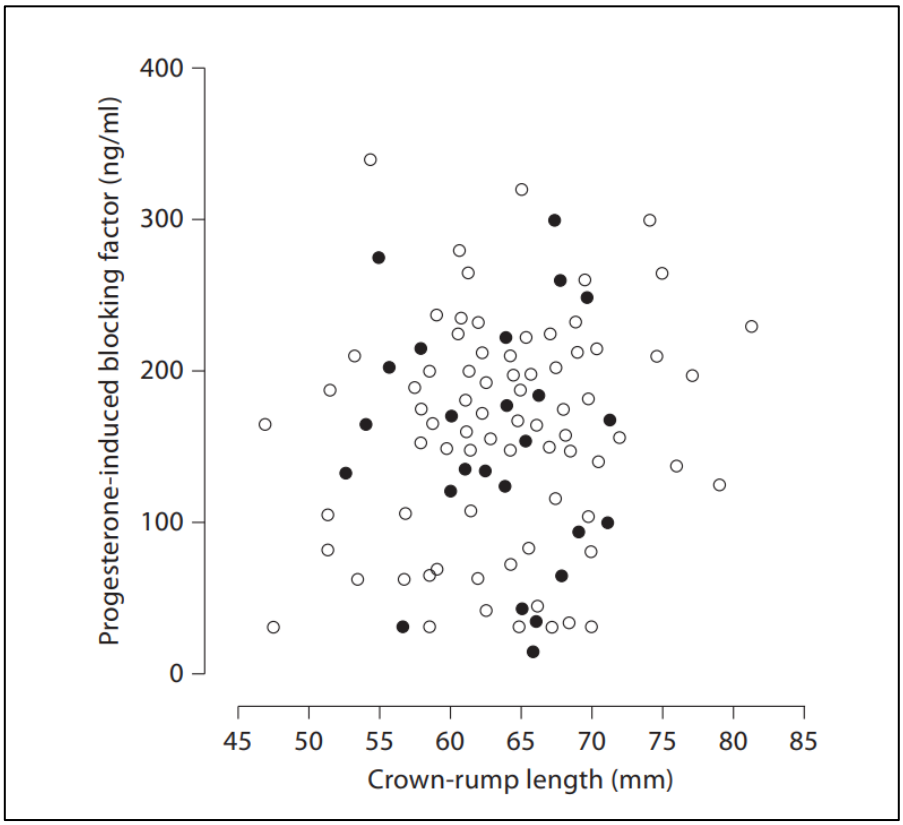

Figure 1: Maternal serum levels of progesterone-induced blocking factor in pregnancies that spontaneously deliver at full term (open circles) and before 34 weeks (closed circles)

Discussion

Through the course of human development, we have created a system that detects and eliminates foreign organic elements that enter the body, defending us against parasites and infections. [10] The immune system is the name of this mechanism. The result of conception is a semi-allograft tissue called a foetus. However, the immune system of the mother does not reject the child. This is because the placental villous trophoblast lacks MHC class I or class II, which prevents the NK cells from engaging in cytotoxic actions. [11.12]

This study demonstrates that, between pregnancies that spontaneously result in early preterm delivery and those that deliver at term, there is no significant difference in the maternal serum concentration of PIBF at 11–13 weeks' gestation. According to this result, the potential mechanism by which PIBF maintains the pregnancy is not changed during the first trimester of pregnancy.

Characterization of PIBF in healthy pregnancies over gestational age is expected to aid in further research and evaluation of its utility as a predictor of pregnancy survival.[13] Because progesterone undergoes reduction and glucuronidation before excretion in different isomers, PIBF is retained in urine and can be measured non-invasively, which may have an advantage over progesterone as a biomarker.[14]

It can be assumed that there is unlike progesterone, which has been shown to decrease with increasing BMI, PIBF, a non-lipophilic protein, may not have a pharmacokinetic distribution in adipose tissue and is not affected by BMI, the amino acid homology between PIBF1 cDNA and other known proteins is negligible.[15] These properties of PIBF increase its attractiveness as a specific target for predicting pregnancy outcome.[16]

In lymphocyte immunotherapy, PIBF has been recognized as a potential therapeutic agent or marker to reduce the risk of miscarriage. [17]

Our finding that spontaneous childbirth before 34 weeks was not associated with a decrease in her PIBF serum levels at her 11-13 weeks suggests that the reported decrease in her PIBF serum levels in preterm women may be associated with the process suggesting that it may be a consequence rather than a cause of in that kind of time. Alternately, the drop in maternal PIBF occurs before the start of labour, but it doesn't show up in serum until the first trimester.

Conclusion

Serum levels of PIBF were significantly lower in pregnant women at risk of first-trimester miscarriage than in normal pregnancies. Furthermore, we demonstrated the potential of PIBF value as a biomarker for the pathological process of pregnancy.

PIBF can also be used as a rational treatment for miscarriage risks. The cut-off value of PIBF required to maintain pregnancy needs to be determined by additional prospective studies.

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