

# THE ROLE OF FETAL FIBRONECTIN IN THE PREDICTION OF PREMATURE BIRTHS

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**Abstract:** premature birth (PB) remains one of the pressing problems of modern obstetrics, as it determines the level of perinatal mortality and morbidity. To date, the role of the fetus in initiating births, including premature births, is beyond doubt. In this regard, it is of interest to study the diagnostic significance of Fetal fibronectin (fFN) for determining markers embryonic origin in the prediction of premature births. The aim of the study is the diagnostic significance of marker detection in the prediction of premature births. A total of 128 pregnant women were examined and divided into a core group of 93 pregnant women and a control group of 35 pregnant women in the physiological course of pregnancy. The dynamics of the level of fFN depending on the length of pregnancy of women have also been studied. According to the data received in the main group, out of 93 pregnant women, the test was positive in 62 pregnant women at different gestation times. Thus, the determination of the level of fetal fibronectin in cervical contents from 22 weeks of pregnancy can be used as biochemical markers of premature births.

**Keywords:** premature birth, myoglobin, fetal fibronectin.

## РОЛЬ ФИБРОНЕКТИНА ПЛОДА В ПРОГНОЗИРОВАНИИ ПРЕЖДЕВРЕМЕННЫХ РОДОВ

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**Аннотация:** преждевременные роды (ПР) остаются одной из актуальных проблем современного акушерства, так как они определяют уровень перинатальной смертности и заболеваемости. На сегодняшний день роль плода в инициировании родов, в том числе преждевременных, не вызывает сомнений. В связи с этим представляет интерес изучение диагностической значимости фибронектина плода (ФП) для определения маркеров эмбрионального происхождения в прогнозе преждевременных родов. Целью исследования является диагностическая значимость выявления маркеров в прогнозировании преждевременных родов. Всего было обследовано 128 беременных женщин, которые были разделены на основную группу из 93 беременных и контрольную группу из 35 беременных с физиологическим течением беременности. Динамика уровня ФП в зависимости от продолжительности беременности у женщин также была изучена. Согласно данным, полученным в основной группе, из 93 беременных женщин тест был положительным у 62 беременных женщин в разные сроки беременности. Таким образом, определение уровня фибронектина плода в шейном содержимом с 22 недели беременности может быть использовано в качестве биохимического маркера преждевременных родов.

**Ключевые слова:** преждевременные роды, миоглобин, фибронектин плода.

**Introduction.** Premature birth (PB) remains one of the pressing problems of modern obstetrics, as it determines the level of perinatal mortality and morbidity. The psycho-social, economic and demographic aspects of the problem of pregnancy failure, as well as the frequency of this pathology, which has not tended to decline over the past 20 years, are important. All this points to the need to fully study the problem of premature births, to find new approaches to forecasting. Unfortunately, anamnesis signs and clinical manifestations do not always make it possible to predict premature births in a timely manner. Maternal, placental and embryonic factors are known to be involved in the development of premature births. To date, the role of the fetus in initiating births, including premature births, is beyond doubt. In this regard, it is of interest to study the diagnostic significance of Fetal fibronectin (fFN) for determining markers embryonic origin in the prediction of premature births.

**The aim of the study** is the diagnostic significance of marker detection in the prediction of premature births.

**Materials and methods** of a research: For quantitative definition of a fFN in contents of a neck of the uterus the test system (Adeza Biomedical Fetal Fibronectin Enzyme Immunoassay) is used. Fibronectin tests were taken in pregnant women with whole peripheric waters within 30-35 weeks of pregnancy, since during these gestation periods in physiological pregnancy it is practically not determined in cervical-vaginal content (less than

50 µg/ml). A total of 128 pregnant women were examined and divided into a core group of 93 pregnant women and a control group of 35 pregnant women in the physiological course of pregnancy.

**Results of the study:** As can be seen from the table in 66.6% of cases the test was positive and in 33.4% it happened negative. The dynamics of the level of fFN depending on the length of pregnancy of women have also been studied.

Table 1. Fetal fibronectin test results

	Test (+)		Test (-)	
	Abs	%	Abs	%
(n=93)	62	66,6	31	33,4
(n=35)	2	5,7	33	94,3

According to the data received in the main group, out of 93 pregnant women, the test was positive in 62 pregnant women at different gestation times. In 9 - (9.6%), pregnant women in 30 weeks gestation, in 6 (6.4%) - 31 weeks gestation, in 11 (11.8%) - in 32 weeks gestation, in 17 (18.2%) in 33 weeks gestation and in 19 (20.4%) in 34 weeks gestation. In a control group of 35 pregnant women were found in only 2 (5.71%) within a gestation period of 34 weeks.

Table 2. Changes in the level of fFN depending on the length of pregnancy of women

	30 weeks		31 weeks		32 weeks		33 weeks		34 weeks		Number of all patients
	Abs	%	Abs	%	Abs	%	Abs	%	Abs	%	
Test +	9	9,6	6	6,4	11	11,8	17	18,2	19	20,4	(n=62)
Test -	5	5,3	7	7,5	4	4,3	9	9,6	6	6,4	(n=31)
<b>Control group (n=35)</b>											
Test +									2	5,7	(n=2)
Test -	-	-	-	-	-	-	-	-			(n=33)

As can be seen from the table 2, the longer the gestation period the more often the result is positive. But given the fact that in pregnant women, fetal fibronectin is normally allowed within up to 8 weeks of gestation and after 37 weeks of gestation, the obtained data show that this method can be attributed to the forecast and one of the risk factors for the development of PR. It should be noted that there were 5 false positive tests for fFN in cervical contents and 1 false negative test. False positive tests were associated with the presence of bacterial vaginosis in the pregnant women examined.

The prognostic significance for the positive test was 91.1%; and 97.2% for negative. It should be said that the possible mechanisms of fetal fibronectin appearance in cervicovaginal content are discussed by various authors. It is believed that the chorion trophoblast in the extracellular matrix is an important source of fibronectin in the cervicovaginal secret. In view of the fact that fetal fibronectin is expressed mainly in the area of the lower segment, two possible ways of its appearance in cervicovaginal secret are assumed.

First way - As a result of increased tone and compressive capacity of the uterus, mechanical tension increases, changes occur from the cervical side, separation of the choriodecidual envelope, which leads to loss of fetal fibronectin from its surface and ingress of the protein of the extracellular matrix of fetal shells into the cervical-vaginal secret.

Second way - bacterial infection in the ascending pathway enters the decidual envelope, the inflammatory reaction develops, bacteria and leukocyte protease destroy the decidual and chorionic extracellular matrix, as a result of which fibronectin appears in a vagina. The same inflammatory process provides local release of cytokines and prostaglandins, premature maturation of the cervical uterus occurs, birth contractions begin.

Thus, the determination of the level of fetal fibronectin in cervical contents from 22 weeks of pregnancy can be used as biochemical markers of premature births.

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