

6. Early diagnosis of cutaneous melanoma: revisiting the ABCD criteria / N. R. Abbasi, H. M. Shaw, D. S. Rigel [et al.] // *JAMA*. – 2004. – Vol. 292, № 22. – P. 2771–2776.

7. Меланома: лечение и диагностика / Республиканский научно-практический центр онкологии и медицинской радиологии им. Н. Н. Александрова : [сайт]. – URL: <https://inlnk.ru/NDvOpR> (дата обращения: 16.10.2025).

## **COMPARATIVE ANALYSIS OF METHODS OF EARLY DIAGNOSIS OF MELANOMA, YOUTH AWARENESS**

*Yankovskaya E.A., Veremeychik D.M.*

*Grodno State Medical University, Grodno, Belarus*

*elizabetaa345@gmail.com*

The integrated use of methods for early diagnosis of melanoma provides the highest efficiency in detecting the disease, since each method has its own unique advantages and limitations. The use of the diagnostic arsenal in combination allows you to increase the accuracy of diagnosis, minimize the likelihood of errors and ensure timely initiation of treatment, which is critical for a favorable outcome of the disease.

## **THE ROLE OF IMMUNE MECHANISMS IN THE PATHOGENESIS OF EARLY PREGNANCY LOSSES**

*Inaza I.F., Kastsova L.V.*

*Grodno State Medical Universit, Grodno, Belarus*

*kostsova94@mail.ru*

**Relevance.** Early pregnancy losses affect a significant proportion of women of reproductive age, but the underlying immune mechanisms remain poorly understood. This article emphasizes the role of cytokine imbalances in contributing to these adverse pregnancy outcomes. As immune-mediated factors may be key drivers of implantation failure and fetal loss, this research supports the need for more targeted investigations into immune biomarkers, potentially guiding personalized treatment approaches for women at risk.

**Research objectives.** To analyze the literature sources demonstrating research on the role of immune mechanisms in the pathogenesis of early pregnancy losses.

**Research methods.** The paper examines and analyzes modern literature sources, articles, abstracts, databases. When writing the paper, information-analytical and evaluative-comparative methods were used.

**Results and its discussion.** The most important factor in a normal pregnancy is the maternal body's immunological tolerance to fetal antigens, as well as the activation of humoral immunity and the production of Th2-type anti-inflammatory cytokines. According to a number of authors found, that women with early pregnancy losses exhibit excessive Th1-type pro-inflammatory cytokines production (tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), IFN- $\gamma$ , IL-6, IL-12, IL-18) linked to trophoblast apoptosis,

impaired placental angiogenesis, and NK cell overactivation. These women also had insufficient Th2-type cytokine response (IL-4, IL-10), reducing immune tolerance and placental growth factors. This imbalance creates a hostile uterine environment, where pro-inflammatory cytokines attack fetal tissues instead and lead to miscarriage.

A number of researchers support that in case of miscarriage Th1-type pro-inflammatory cytokine - tumor necrosis factor- $\alpha$  triggering trophoblast apoptosis via caspase-8 activation and inhibiting invasiveness by downregulating integrins. In addition interferon- $\gamma$  (IFN- $\gamma$ ) upregulates MHC class I/II on trophoblasts, making them vulnerable to maternal immune attack. Pro-inflammatory cytokines IL-12 and IL-18 promote NK cell cytotoxicity and Th1 polarization, further amplifying inflammation, that can lead to pregnancy loss.

Other authors demonstrate that in women with miscarriages, the level of Th2-type of anti-inflammatory cytokine - IL-4 were increased, while a weak negative correlation was found between IFN- $\gamma$  levels and the number of miscarriages. However, the levels of Th1-type pro-inflammatory cytokines (IL-6, IL-8, IL-12, IL-18, TNF- $\alpha$ , and IFN- $\gamma$ ) were significantly higher during miscarriages.

**Conclusions.** The findings suggest that women with miscarriage had significantly higher levels of pro-inflammatory cytokines Th1-type and lower levels of cytokines Th2-type compared to the group of women with physiological pregnancy that confirm the role of cytokine imbalance in miscarriage and what should be considered in a personalized approach to the treatment of women of this group.

#### **References**

1. Chaouat, G. The Th1/Th2 paradigm: still important in pregnancy? / G. Chaouat // *Semin Immunopathol.* – 2007. – Vol. 29, № 2. – P. 95–113.
2. Ashkar, A. A. Interferon-gamma contributes to the normalcy of murine pregnancy / A. A. Ashkar, B. A. Croy // *Biol Reprod.* – 1999. – Vol. 61, № 2. – P. 493–502.
3. Th1/Th2/Th17 and regulatory T-cell paradigm in pregnancy / S. Saito, A. Nakashima, T. Shima, M. Ito // *Am J Reprod Immunol.* – 2010. – Vol. 63, № 6. – P. 601–610.
4. Immunological modes of pregnancy loss: inflammation, immune effectors, and stress / J. Kwak-Kim, S. Bao, S. K. Lee [et al.] // *Am J Reprod Immunol.* – 2014. – Vol. 72, № 2. – P. 129–40.

## **THE ROLE OF IMMUNE MECHANISMS IN THE PATHOGENESIS OF EARLY PREGNANCY LOSSES**

***Inaza I.F., Kastsova L.V.***

*Grodno State Medical Universit, Grodno, Belarus*

*kostsova94@mail.ru*

Early pregnancy losses affect a significant proportion of women of reproductive age, but the underlying immune mechanisms remain poorly understood. This article emphasizes the role of cytokine imbalances in contributing to these adverse pregnancy outcomes.