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Respiratory Infection and Pregnancy

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Abstract: The problem of treating influenza and acute respiratory infections in pregnant and breastfeeding women remains an urgent issue of global public health. Pregnant women belong to a high-risk group for respiratory infections due to hormonal and physiological changes occurring during gestation, which predispose them to a severe and complicated course of disease, especially in the third trimester of pregnancy. The limited number of medicinal products that are both effective and approved for use during pregnancy highlights the need to develop and implement new approaches to the prevention and treatment of acute respiratory viral infections (ARVI) in pregnant women.

At present, one of the most promising directions is the use of drugs with antiviral properties that also enhance immune system function, thereby preventing complications and reducing reproductive losses.

Keywords: Acute respiratory infections; pregnancy; breastfeeding women; recombinant interferon alfa-2b.

Introduction:

To evaluate the effectiveness of pharmacological prevention of influenza using VIFERON® (interferon alfa-2b) in the form of rectal suppositories and topical gel in combination with highly active antioxidants.

Materials and Methods

A prospective comparative study was conducted involving three groups of pregnant women:

- Main group (n = 16): received recombinant interferon alfa-2b combined with highly active antioxidants (Viferon®, rectal suppositories) at a dose of 3,000,000 IU once daily for 7 days;
- Second group (n = 16): received interferon alfa-2b combined with highly active antioxidants (Viferon®, topical and local gel) at a dose of 36,000 IU/g twice daily for 7 days;
- Comparison group (n = 16): did not receive preventive therapy.

The article analyzes clinical symptoms and treatment effectiveness of influenza and acute respiratory infections in pregnant and breastfeeding women treated with VIFERON® (interferon alfa-2b) rectal suppositories in combination with comprehensive therapy (ascorbic acid, zinc, vitamin D3, and a β-lactam antibiotic to prevent disease progression). The second

group used topical gel, while the third comparison group did not receive interferon alfa-2b.

Influenza and acute respiratory viral infections (ARVI) annually occupy leading positions in the structure of infectious diseases both in the Republic of Uzbekistan and worldwide. ARVI represent a group of numerous independent diseases characterized by viral damage to the upper and lower respiratory tract caused by viruses belonging to various genera and families. Etiological studies have demonstrated the leading role of non-influenza pathogens, such as respiratory syncytial virus, adeno-, rhino-, metapneumo-, corona-, boca-, and parainfluenza viruses, which often form mixed infections [1–3].

It is well known that influenza and ARVI lead to decreased nonspecific resistance of the body, suppression of functional activity of various components of the immune system, exacerbation of chronic diseases, and development of secondary bacterial complications, which underscores the importance of prevention and treatment. High-risk groups include pregnant and breastfeeding women, newborns and young children, individuals over 60 years of age, and patients with chronic diseases (including pulmonary, cardiovascular, metabolic disorders, and obesity) [4].

Pregnant women represent a special risk group due to hormonal and physiological changes during gestation, which predispose them to severe and complicated courses of influenza and ARVI, particularly in the third trimester. One of the main reasons for severe infections during pregnancy is physiological immunosuppression (associated with increased levels of cortisol, estrogens, progesterone, and chorionic gonadotropin), which intensifies as pregnancy progresses. In this context, an important preventive measure is the use of drugs that enhance nonspecific resistance and activate immune system functioning [11], helping to prevent complications and reproductive losses. However, the use of immunomodulatory agents is limited by contradictory data regarding their efficacy and safety during pregnancy.

A systematic review of studies evaluating clinical efficacy and safety of medicinal products, including assessment of evidence levels and study methodologies, as well as their inclusion in clinical guidelines and standards, has shown that the domestic drug Viferon® meets these criteria [15–18]. Viferon® is available in rectal suppositories of various dosages and topical forms (gel, ointment). Its active ingredient is human recombinant interferon alfa-2b, combined with antioxidants such as alpha-tocopherol acetate, ascorbic, citric, and benzoic acids. The membrane-stabilizing components enhance plasma antioxidant activity, antiviral effects of interferon, and its immunomodulatory action, thereby improving immune response to infectious agents.

The drug does not cross the placenta and has no adverse effects on fetal immune development. Consequently, the combination of interferon alfa-2b with highly active antioxidants minimizes undesirable side effects, allowing its use during pregnancy (suppositories from the 14th week of gestation; gel/ointment at any stage) and during breastfeeding without restrictions.

In addition to physiological immunosuppression, pregnancy is accompanied by anatomical and functional changes in the respiratory system that increase susceptibility to respiratory infections, promote complications, and facilitate infection generalization. These changes include reduced total lung volume and respiratory excursion due to diaphragmatic elevation. As pregnancy progresses, oxygen demand increases, and dyspnea develops in up to 50% of pregnant women, affecting overall well-being. Recovery of immune, respiratory, and cardiovascular systems occurs several weeks postpartum; therefore, even during uncomplicated pregnancy, influenza and ARVI may have a complicated course during epidemics.

Leading risk factors for ARVI, including influenza and COVID-19 during pregnancy, include iron-deficiency anemia, obesity, gestational diabetes mellitus, and chronic nicotine intoxication. Major complications following influenza and COVID-19 include placental insufficiency, threatened miscarriage, preeclampsia, fetal hypoxia during labor, and intrauterine infection [15].

Conclusions

The use of recombinant interferon alfa-2b in pregnant women with respiratory infections reduces the overall duration of illness and intoxication, decreases the incidence of severe and complicated forms, lowers the risk of preterm birth and low birth weight, and reduces exacerbations of chronic (including extragenital) diseases.

In the first group, respiratory symptoms decreased by days 4–5 of therapy, with improvement in general condition. In the second group, respiratory symptoms persisted for 7–8 days and were accompanied by fatigue, drowsiness, and loss of appetite. Additional therapy with ascorbic acid, zinc, and β-lactam antibiotics for 5 days was required. The results confirmed high clinical and immunological efficacy of this combination, manifested by significant reduction

in symptom duration and overall disease course.

Interferon alfa-2b therapy also demonstrated a positive effect on levels of the pro-inflammatory cytokine interleukin-6 (IL-6), which may be a favorable prognostic marker for recovery. Most deliveries in the interferon-treated groups occurred at term, with no cases of antenatal fetal death, whereas in the standard therapy group fewer term deliveries were observed and two cases of antenatal fetal death at 26 weeks were recorded.

Good tolerability of combined therapy with Viferon® was noted, allowing the authors to consider this regimen a promising and safe option for treating pregnant women with COVID-19 [24].

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