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FEATURES OF ALLERGIC DISEASES IN PREGNANT WOMEN

ОСОБЛИВОСТІ АЛЕРГІЧНИХ ЗАХВОРЮВАНЬ У ВАГІТНИХ

Kaspruk N.M. / Каспрук Н.М.
c.med.s., as.prof. / к.мед.н., доцент
ORCID: 0000-0002-0113-4727
Department of Clinical Immunology, Allergology and Endocrinology
Кафедра клінічної імунології, алергології та ендокринології
Batranovska S.O. / Батрановська С.О.
prof. assist. / асистент
ORCID: 0000-0003-2822-7314
Department of Pharmacology
Кафедра фармакології
Melnychuk S.P. / Мельничук С.П.
c.med.s., as.prof. / к.мед.н., доцент
ORCID: 0000-0002-8784-178X
Department of Pharmacology
Кафедра фармакології
Bukovinian State Medical University,
Teatralna Sq. 2, Chernivtsi, 58002, Ukraine
Буковинський державний медичний університет
Театральна пл. 2, Чернівці, 58002,Україна

Abstract. *Allergic diseases (AD) are among the most prevalent diseases in industrialized countries, affecting 18%–30% of women of childbearing age. In particular, allergic rhinitis, asthma, atopic dermatitis, and food allergy represent the most important allergic phenotypes. In pregnancy, asthma has been associated with increased adverse perinatal outcomes, such as preterm birth, low birth weight, and preeclampsia. Undoubtedly, the symptoms of allergy accompanying exacerbation of AD affect the psycho-emotional state of a pregnant woman, which negatively influances the course of pregnancy. Moreover, the fact that, in general, there are no clear recommendations for the treatment of this group of diseases in pregnant women adds to the relevance of the problem of AD during pregnancy. The work presents an analysis of the structure of AD in pregnant women. The study was conducted in pregnant women with suspected AD at the Department of Clinical Immunology, Allergology and Endocrinology within 2019-2022. For 4 years, 92 patients aged 18 to 40 years were examined at a gestational age of 8-38 weeks. An anamnesis was taken from all patients, otorhinolaryngological status was assessed, data from a clinical blood test, allergy test, bacteriological examination of swabs from the oropharynx and nasal cavity, spirometry were analyzed, and the total content of IgE in the blood was determined. The titers of specific IgE in vitro were evaluated. IgE-dependent AD mechanism was confirmed only in 13,04% of cases. In pregnant women, in the structure of common manifestations of AD, respiratory allergies appear more often than in the general population. In 8.8% of cases, increases in total Ig E were not associated with clinical signs of an allergic disease. More often, pregnant women, according to test results, find sensitization to household allergens. 66,67% of women with allergic dermatoses and 51,85% of women with respiratory allergies note a worsening of the course or debut of AD during pregnancy. Among the causes of Ig E-independent allergic diseases, hypersensitivity reactions to food and drug factors predominate.*

Keywords: *allergic diseases; asthma; atopic dermatitis; pregnancy; allergic rhinitis.*

Introduction.

The urgency of the problem of allergic diseases (AD) during pregnancy primarily lies in the absence of clear recommendations for the treatment of this group of diseases in pregnant women. But there is no doubt that the allergy symptoms accompanying exacerbation of AD affect the psycho-emotional state of a pregnant woman, which can adversely influence the course of pregnancy. AD are among the most prevalent diseases in industrialized countries, affecting 18%–30% of women of childbearing age [1, 2]. While the risk of allergic reactions is higher in males during childhood, there is a shift during adolescence toward females. In particular, allergic rhinitis, asthma, atopic dermatitis, and food allergy represent the most important allergic phenotypes. In pregnancy, asthma has been associated with increased adverse perinatal outcomes, such as preterm birth, low birth weight, and preeclampsia [1, 3, 6].

The main text. Physiological changes in the body of pregnant women that affect the course of AD are described in detail in the literature. They are numerous, can have an opposite effect on the course of chronic diseases, and are associated primarily with hormonal and immunological changes. Hormonal shifts are characterized by a decrease in the clearance of glucocorticosteroids (GCS) with an increase in the synthesis of chorionic gonadotropin and estrogens, which activate mast cells and have an anti-allergic effect. An increase in progesterone synthesis leads to inhibition of histamine release and increased IgE synthesis, as well as a decrease in smooth muscle tone and expression of β2-adrenergic receptors [3, 4].

The main task of immunological restructuring in the body of a pregnant woman is to prevent the rejection of a genetically alien embryo/fetus. One of the important mechanisms in this case is the suppression of cytotoxic mechanisms, including the Th1 phenotype of the immune response. The biological content of this phenomenon is the prevention of fetal rejection due to the activation of gamma-interferon-dependent cytotoxic mechanisms with an increase in antigenic load (infection, fetoplacental insufficiency, etc.), which, accordingly, leads to the predominance of proallergic Th2 cytokines. The literature shows a clear upward trend in total IgE and IL-4 during pregnancy. An increase in the level of eosinophilic cationic protein, prostaglandins PgE2 and F2a can also lead to exacerbation of allergopathology during pregnancy [1-5].

The extensive exchange of factors between the mother and the child does not involve IgE. There is a general paradigm that IgE does not cross the placenta, which has been challenged recently, [5] but there is limited knowledge on the potential role of IgE in pregnancy on IgE receptor-positive maternal effector cells. In line with the type 2 response promoting periods, an increase in IgE levels is observed. The clinical significance and impact of IgE levels on pregnancy outcomes remain unclear [6]. Pregnancy had a clear effect on the allergen-induced IL-5, IL-13, CCL17, IFN-γ and CXCL10 production, with distinct enhanced Th2-responses to birch in the allergic group and to cat in the non-allergic group [7].

The following facts complicate the treatment of AD in pregnant women: 60-80% of women constantly take other drugs, and 40-45% have diseases of the internal organs. An average pregnant woman takes tablets of 4 types or more for 9 months, not counting trace elements, vitamins and dietary supplements [5-7].

The aim of the work was to study the structure of allergic diseases in pregnant women.

The study was conducted in pregnant women with suspected AD at the Department of Clinical Immunology, Allergology and Endocrinology within 2019-2022. Patients were selected according to a questionnaire aimed at identifying an allergic syndrome according to anamnesis. Pregnant women with fever, cough, sore throat, chronic polypous rhinosinusitis, and chronic bronchitis were excluded from the study. Over 4 years of research, we examined 92 patients aged 18 to 40 years at 8-38 weeks of gestation. In the first trimester of pregnancy there were 35 (38.04%) patients, in the second – 40 (43.48%), in the third – 17 (18.48%).

An anamnesis was collected from all patients, otorhinolaryngological status was assessed, data from a clinical blood test, allergy tests, bacteriological examination of smears from the oropharynx and nasal cavity, and spirometry were analyzed.

From laboratory research methods during pregnancy, the total content of IgE in the blood was determined, the reference values of which in an adult are up to 100 IU/ml. In addition, specific IgE titers in vitro were assessed, which can be compared in terms of diagnostic significance with allergic skin tests, which, like various provocative tests, are not performed during pregnancy.

Results and discussion.

Despite the fact that according to the anamnesis, allergic genesis was suspected in all the examined, we were able to confirm its IgE-dependent mechanism only in 13,04% of pregnant women. Clinically, AD was manifested by allergic dermatoses in 29.35% of women, allergic rhinitis (AR) in 64.13%, allergic bronchial asthma (BA) in 16.3%, and allergic conjunctivitis (AC) in 6.52%. Allergic pathology in the form of several nosologies (2-3 diseases) with damage to one or more systems occurred in 18,47% of cases. One-time allergic skin manifestations in history had 17.1% of pregnant women (Figure 1).

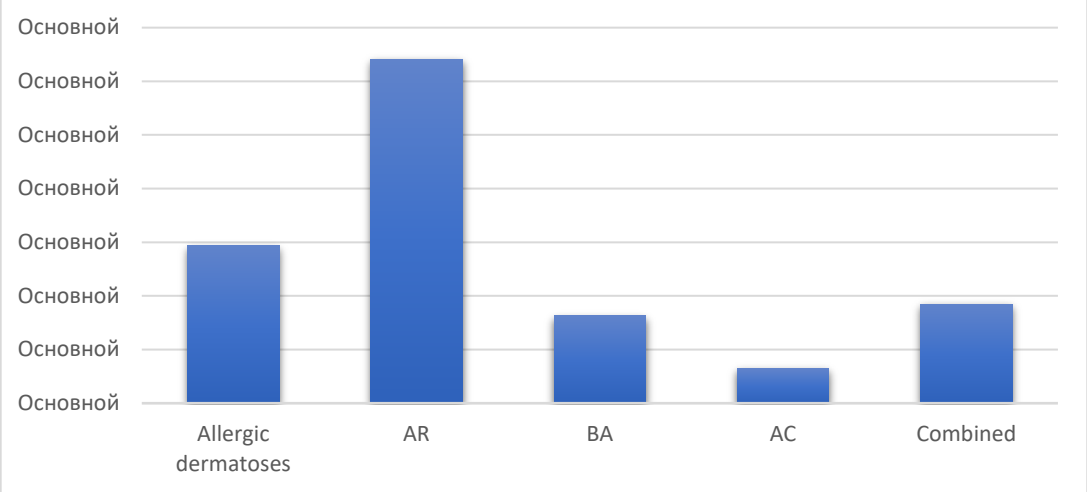

Figure 1 – Clinical manifestations of allergic diseases

Source: Author's calculations based on the data of study

When determining total IgE, the level above the normative values was detected in 20.9% of cases. The highest frequency of hyperimmunoglobulinemia E was found in women with single allergic manifestations (42.9%), less often an elevated IgE level

was manifested in pregnant women with AD (positive personal and family history) (12.5%) and conditionally healthy (5.5%). The average level of total IgE was also the highest in women with a history of allergies 246.29±91.15 IU/ml, in pregnant women with single allergic manifestations 58.26±17.51 IU/ml, in healthy women it was 67.92 ± 17.62 IU/ml.

When determining allergen-specific IgE antibodies in pregnant women, sensitization to individual allergens was found in 64 women (69.56% of cases). In particular, household allergens (house dust – 67.2%, pillow feathers – 29.7%), pollen allergens (43.75%), medications (31.25%), food allergens (15.62%), epidermal allergens (9.37%), and insect (1.56%) (Figure 2).

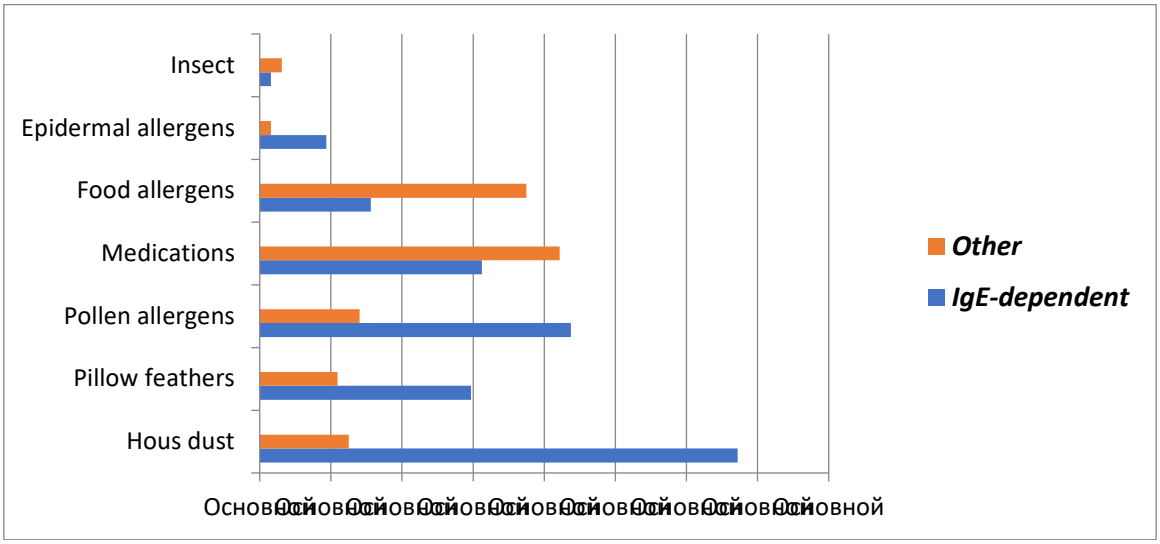

Figure 2 – Revealed sensitization to certain allergens according to the determination of allergen-specific IgE antibodies in pregnant women

Source: Author's calculations based on the data of study

The prevalence of food sensitization was different depending on caused allergen, the most significant allergens during this period were usually more relevant in pediatrics: 23.43% of pregnant women were sensitized to chicken and cow's milk protein, 17.19% to chicken eggs.

When analyzing the skin manifestations of AD in pregnant women was received the following data: 66,67% of women with allergic dermatoses experienced a worsening of the course or debut of a skin disease during pregnancy, 14,81% noted an improvement, and 18.52% did not notice any dynamics of the disease.

In 51,85% of women with asthma and allergic rhinitis, their course worsened. More than half of all exacerbations of atopic asthma begin in the first trimester, somewhat less in the second, and only 5-7% of all cases of exacerbations occur in the 3rd trimester. This allows us to conclude that the cause of asthma exacerbation during pregnancy is not compression of the airways by the diaphragm, but primarily hormonal and immunological changes.

The majority of women who report a worsening of AD have an exacerbation before 20 weeks of gestation. Such a large percentage of deterioration during gestation may be associated with immune changes: AD is associated with a Th2 response. In addition, it is reported that during pregnancy there are a number of physiological

vascular changes in the skin and mucous membranes that contribute to swelling and itching [1-5].

Non-sedating, second-generation antihistamines are recommended for treatment. First generation of antihistamines – chlorpheniramine, diphenhydramine, and hydroxyzine are not recommended for the treatment of allergic diseases due to their pregnancy independent safety profile. In the case of prescription, no increased rates of congenital malformation have been reported. Chlorpheniramine has been recommended as the first choice for first-generation antihistamines. The drugs of choice of second generation H1-antihistamines with less sedating properties are cetirizine and loratadine [4, 6].

Conclusions.

1. In pregnant women, in the structure of common manifestations of AD, respiratory allergies appear more often than in the general population.

2. In 8.8% of cases, increased values of total IgE were not associated with clinical signs of an AD.

3. More often, pregnant women, according to test results, find sensitization to household allergens.

4. 66,67% of women with allergic dermatoses and 51,85% of women with respiratory allergies report worsening of the course or debut of AD during pregnancy.

5. Among the causes of IgE-independent AD, hypersensitivity reactions to food and drug factors predominate.

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Анотація. *Алергічні захворювання (АЗ) є одними з найпоширеніших захворювань у промислово розвинених країнах, вражаючи 18–30 % жінок дітородного віку. Зокрема, алергічний риніт, астма, атопічний дерматит і харчова алергія є найважливішими*

алергічними фенотипами. Під час вагітності астма пов'язана зі збільшенням несприятливих перинатальних наслідків, таких як передчасні пологи, низька вага при народженні та прееклампсія. Безумовно, симптоми алергії, що супроводжують загострення АЗ, позначаються на психоемоційному стані вагітної жінки, що негативно позначається на перебігу вагітності. Крім того, актуальності проблеми АЗ під час вагітності додає той факт, що загалом немає чітких рекомендацій щодо лікування цієї групи захворювань у вагітних. У роботі представлено аналіз структури АЗ у вагітних. Дослідження проводили у вагітних з підозрою на АЗ на базі кафедри клінічної імунології, алергології та ендокринології протягом 2019-2022 рр. За 4 роки обстежено 92 пацієнтки віком від 18 до 40 років при терміні вагітності 8-38 тижнів. У всіх пацієнтів зібрано анамнез, оцінено оториноларингологічний статус, дані клінічного аналізу крові, алергопроби, бактеріологічного дослідження мазків з ротоглотки та порожнини носа, спірометрії, визначено загальний вміст IgE в крові. Визначали титри специфічних IgE in vitro. IgE-залежний механізм АД підтверджено лише в 13,04% випадків. У вагітних у структурі поширених проявів АЗ респіраторні алергії зустрічаються частіше, ніж у загальній популяції. У 8,8% випадків підвищення загального Ig E не було пов'язане з клінічними ознаками АЗ. Частіше у вагітних за результатами обстежень виявляють сенсибілізацію до побутових алергенів. 66,67% жінок з алергічним дерматозом і 51,85% жінок з респіраторною алергією відзначають погіршення перебігу або дебют АЗ під час вагітності. Серед причин Ig E-незалежних АЗ переважають реакції гіперчутливості на харчові алергени та лікарські препарати.

Ключові слова: *алергічні захворювання; астма; атопічний дерматит; вагітність; алергічний риніт.*

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